(Paper Format)

Duration: 3 hrs.   **SECOND MATE (F.G.)**   Maximum Marks: 200

Pass Marks: 140

TERRESTRIAL AND COASTAL NAVIGATION

<u>Note</u>:   1.   Use chart - --------and Admiralty tide tables for 1992

2.   Ship's speed -------, HE ----m, Var ----, Deviation card ---

PART A

QUESTION NO.1 IS COMPULSORY. ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING THREE QUESTIONS: (30 MARKS EACH)

1. PASSAGE PLANNING

2. PLOTTING

3. PLOTTING

4. PLOTTING

(Running fix with combination of terrestrial and celestial observations, fixing position using three bearings, three point bearings, horizontal sextant angle, raising and dipping of lights, first sighting and last sighting of lights, allowing and counteracting current, tidal streams, wind and leeway).

PART B

ALL QUESTIONS ARE COMPULSORY:

5. DAYS WORK   (30 MARKS)

6. GREAT CIRCLE/ PLANE/MERCATOR SAILING.   (30 MARKS)

7. TIDE CALCULATIONS   (30 MARKS)

8. CHART CORRECTION /CHART SYMBOLS/OTHERS   (20 MARKS)

Please note that the above format is only an indicative of the examination paper. The candidates are advised to refer to detailed teaching syllabus and the course outline.

TIME: 3 Hours	PASS MARKS: 140	MAX. MARKS: 200

Notes:

1. **Use Chart no. 5056 (Start point to the Needles), Deviation Card no. 4, HE 12m and Variation as per chart. Ship speed 12 knot, if not given in the question.**
2. **Luminous range diagram may be provided if necessary.**
3. **Use Admiralty Tide Tables for 1992.**
4. **Position of landmarks are approximate and are to be used for identification purpose only.**

PART – A

QUESTIONS NO. 1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM REMAINING THREE.

(30 marks each)

Q.1 Your vessel with maximum draft of 12 meters sailed from Portland harbour and disembarked pilot at position 50° 35.2' N 002° 22' W. From this position, she has to reach "Needles channel" pilot station (50° 37.8'N 001° 39'W). Vessel is fitted with all required navigational equipment's including ECDIS. Plan a safe passage and write the synopsis of passage planning on your answer sheet.

Q.2 While steering a course of 276° (G), following bearings of Bill of Portland Lt.Ho (50° 31.0'N 002° 27'W) were observed at 1300 hrs 327° (G), 1330 hrs 032° (G) and at 1350 hrs 067° (G). If Gyro Error was 2° Low and current was setting 025° (T) at 4 Kts, Find Course made good, engine speed and position at 1300 and 1350 hours.

Q.3 1200 hrs vessel observes radar distance of Berry head light (50° 24.5'N 003° 28.8'W) was 6' same vessel again at 1230 hrs observes radar distance of Start point light (50° 13.4'N 003° 39'W) was 5'. During time interval between 1200 hrs to 1230 hrs course steered by vessel was 175° (T), engine speed was 12 kts, Current was setting 270° (T) at rate 2 kts. Find out vessel's position at 1200 hrs and 1230 hrs.

Q.4 From a vessel steering 255° (T), East Channel Racon (49° 59'N 002° 29'W) was last seen at 2210 hours in the meteorological visibility of 2 miles. At 2245 hours, Channel Lt. Vessel (49° 54.5'N 002° 55'W) was first sighted. Current was setting 305° (T) at 3 knots and visibility remained same at 2 miles. Find ship's position at 2245 hours and course and speed made good from 2210 hrs to 2245 hrs.

PART – B

All questions are compulsory. Questions 5, 6, 7 are for 30 marks each and Q.8 for 20 marks.

Q.5 On 1st April noon a vessel in position 30° 30'N 070° 45'E steamed following courses: 1200 hr course was 300° (T), next alteration was at 1900 hrs to 010° (T). Engine break down took place between 2000 hrs to 2100 hrs, vessel resumed her course of 010° (T) and attained engine speed of 12 kts instantly. Next alteration was at 0500 hr to 045° (T). Current was setting throughout NE @ 3 kts and clocks were retarded by 01 hour at midnight.

Find —

a) Course and distance made good noon to noon
b) Position arrived at next day noon. (Engine speed was throughout 12 kts).

Q.6 A vessel sailed on Initial G.C course 210° (T) from position 38° 30'S 025° 30'W for a distance of 1000 NM. Find Latitude and Longitude arrived and final course.

Q.7 Find the earliest time to sail out of Walnut Groove (Sacramento River, ATT Vol. 3), after 7 'o' clock in the morning of the 17th Feb 1992. Master wants a height of tide at least 1m at the time of sailing.

Q.8 a) List Admiralty Nautical Publications to be carried on board.

b) Draw Following Symbols as used on BA charts:

  i. Safety Fairway buoy   ii. West Cardinal mark

  iii. Sounding of doubtful depth   iv. Submarine pipeline

  v. Radio reporting point (both ways)

****************************X***X****************************

GOVERNMENT OF INDIA

AM Paper Date: - 6ᵗʰ Nov-2025

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use Admiralty Tide tables for 1992.
2. Use Chart No. **5072**. Use Deviation Card No. 2. HE 12m, Engine Speed 12 knots if not mentioned in the question: Variation 6°W.
3. Luminous range diagram may be provided if necessary.
4. **Position of landmarks are approximate and are to be used for identification only.**

PART – A

Questions No. 1 is compulsory. Attempt any 2 questions from remaining 3:

(30 marks each)

Q.1) Your vessel, a tanker with draft of 12.5 m and speed of 12 knots, drops Pilot at Simrishman Pilot station (55° 33.5'N 014° 24'E) and is bound for Kullagrund Pilot station (55° 13.3'N 013° 23.5'E) in restricted visibility. Vessel is equipped with all navigational equipment. Plan a safe passage. Courses to be plotted on the chart, with clear marking of course, distance and alteration points for each leg of passage. Passage plan to be written in Tabular format in your answer sheet.

Q.2) A vessel in D.R. position 55°09'N 015°22'E, steering 307° (T) first sights Svaneke Lt.Ho. (55°08'N 015°10'E) at 2000 hrs in Meteorological visibility of 2 miles. The vessel is experiencing current setting North at 3.5 knots and NE'ly wind causing 3° leeway. Thereafter the visibility improves and at 2100 hrs the vessel observes Hammerodde Lt Ho, and the Christianso Lt.ho. on reciprocal bearings. Find CMG, SMG and the vessel's positions at 2100 hrs and 2000hrs.

Q.3) a) A vessel steering 000° (T) observes Hammeren Lt.Ho. (55°17'N, 014°45'E) bearing 045° (T) at 0900hrs, the same lt ho. Is abeam at 0927 hrs. Find the position of the vessel at 0927 hrs.
b) From the position obtained above find the course to steer and engine speed required to reach Taggen Pilot stn (55°53.4'N, 014°35.7'E) at 1310 hrs, if current was setting 225° (T) at 3 knots. Also find the time and distance off when Simrishamn Lt Ho. will be abeam.

Q.4) While steering a course of 228° (T) Olands Sodra Grund Racon light (56°04'N, 016°42'E) was last sighted at 2100 hrs, when visibility was 5 M only. At 2200 hrs Utklippan Lt. (55°57'N, 015°41'E) was first sighted, visibility remaining the same. Current was known to be setting 013°(T) at 2.5 knots throughout. Find the vessel's position at 2100 hrs and 2200 hrs and also the time and position when Utklippan light will be last sighted.

All questions are compulsory. (Question 5, 6, 7 carry 30 marks each; and Question No. 8 for 20 marks).

Q.5 Following courses and distances were steamed by a vessel doing 15 kts, between Noon of 15th Jan till noon of 16th Jan. The noon position on 15th Jan was observed to be 10° S 045° E.

Time	Compass. Co	Variation (deg) E/W	Deviation (deg) E/W
1200–1800	150°C	2° E	3° E
1800–2400	135°C	2° E	5° W
0000–0600	090°C	2° E	6° E
0600–1200	120°C	2° E	3° W

Calculate expected Noon position for 16th January.

Q.6 Calculate distance, initial course and position of vertex of a Great Circle track from **42° 36'S 140° 24'W** to **26° 24'S 150° 54'E**.

Q.7 A vessel having a draft For'd 6m Aft 7 m wants to clear a bar (charted depth 6 m), at Bombay (#4359) on 15th February 1992 with a UKC of 2 m. Find the earliest time in the evening, when the vessel can do so.

Q.8 Draw following symbols in your answer sheet:
a) Fairway buoy,   b) East cardinal mark,   c) North Cardinal mark,
d) Wreck depth unknown and dangerous to surface navigation; and
e) Submarine power cable.

**************************X***X***************************

PM PAPER   Date: - 3rd Sept-2025

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   PASS MARKS: 140   MAX. MARKS: 200

Notes:
1. Use Chart no. 5056 (Start point to the Needles), Deviation Card no. 1, HE 10m and Variation as per chart. Ship speed 12 knot unless specified in the question, unless specified in the question.
2. Luminous range diagram may be provided if necessary.
3. Use Admiralty Tide Tables for 1992.
4. Position of landmarks are approximate and are to be used for identification only.

PART – A

QUESTIONS NO. 1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM REMAINING THREE.
(30 marks each)

Q.1 A Bulk carrier with a maximum draft of 11 m drops pilot at Needles Channel pilot station (50° 37.8' N 001° 39' W) and is bound for Portland Harbour (50° 36' N 002° 25' W). Vessel is equipped with all the required Navigational equipment including ECDIS. Plan a safe passage for the intended route. Courses need to be plotted on the chart. Course and distance for each leg of passage and course alteration points to be clearly shown on the chart.

Q.2 At 0200 hrs straight Pt Lt. (50° 36.6'N 003° 21.7'W) bore 300° (T) when the vessel crossed 30m contour. Find the ship's position. From this position find the course to steer to pass Bill of Portland Lt. (50° 31'N 002° 27'W) 9' off to port. Engine speed 12 kts. Vessel experiencing a NE'ly wind causing a leeway of 5°, current setting 180° (T) x 2 kts. Also, find the time & position, when the vessel will pass bill of Portland light 9 NM off to port.

Q.3 A tanker while steering 270° (T) observes the Needles light to bear North at a distance of 6 miles at 1800 hours. At 1830 hours the same light bore 042° T at a distance of 10M. At 1900 hours, the main engine was stopped on an emergency basis for repairs. The main engines were restarted at 2300 hours. Assuming that the full speed was effective instantly find the course to Weymouth Bay anchorage (50° 36'N 002° 24' W).

Q.4 A vessel steering 084° (C) allowing for a current setting 234°T at 2.4 knots observed Berry Head Lt. (50° 24'N 003° 29' W) bearing 348°(C) and Start Pt. Lt. (50° 13'N 003° 38'W) bearing 245° (C). Find the vessel's position and estimate the relative bearing and distance off Bill of Portland Lt. on first sighting. Meteorological visibility is estimated to be 5 miles. Height of observer 10m. Steaming speed 12 knots.

PART – B

All questions are compulsory. Questions 5, 6, 7 are for 30 marks each and Q.8 for 20 marks.

Q.5 At 1200 hours on 25th June, 1992 a point of land in Lat. 24° 37' N long. 047° 12' W bore 057° (T) distance off by radar 5.5 miles. She then sailed the following courses and distances.

Gyro Co.	Gyro Error	Distance	Wind Direction	Leeway
347°	1° High	111 NM	SW	3°
001°	Through	47 NM	W	Nil
187°	Out	27 NM	W	1°

Find the estimated arrival position. If the final position by observation was 26° 27.5' N 047° 32.2' W, find the set and drift of the current experienced and the course and distance made good.

Q.6 Find the great circle distance, initial course and final course from A 06° 00' N 079° 00' W to B 38° 00' S 179° 00' E.

Q.7 The clearance of a Bridge given on the chart is 80 m. Mean High Water Spring (MHWS) level is 5 m. What will be the bridge clearance at 1200 hours LMT at Antwerp on 5th March 1992?

Q.8 a) Extracts of Admiralty weekly Notices to Mariners No. 04 of 2012, No.625 is as follows:
Insert isolated danger mark buoy in position 50° 34.2'N 002° 38.2'W.
Insert Oil rig (lit) in position 50° 41'N 001° 50' W.
Correct the chart and record the correction for the NM 625 of 2012 in Pencil.
b) How will you verify whether the chart was up-to-date prior to this correction?

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GOVERNMENT OF INDIA

AM Paper   Date: - 3rd Sept-2025

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use Admiralty Tide tables for 1992.
2. Use Chart No. **5072** (Falster Bo to Oland). Use Deviation Card No. 2. HE 10m, Engine Speed 12 knots if not mentioned in the question: Variation 6°W.
3. Luminous range diagram may be provided if necessary.
4. **Position of landmarks are approximate and are to be used for identification only.**

PART – A

Questions No. 1 is compulsory. Attempt any 2 questions from remaining 3.

(30 marks each)

Q.1. A container vessel with maximum draft of 8.5 mtr sailed out from Ahus harbour. She disembarked her pilot in position 55° 53.4'N 014° 35.7'E. From this position, plan your safe passage to join north-east bound traffic line of Oland's Sodra Grund TSS. During the passage vessel should pass Utklippan light with minimum distance of 6 miles. Courses to be plotted on the chart, with clear marking of course and distance, for each leg of passage. Also each course alteration points should be clearly marked on the chart. Write a brief summary of passage plan in the answer sheet.

Q.2. A ship steering 284°T, at 0900 hrs Sandhammaren Lt. (55°23'N, 014°11.8'E) bore 311°T. At 0940 hrs bore 352°T and again at 1010 hrs it bore 038°T. During this period the current was setting 190°T at 2 knots. Find following:
a) Position at 0900 hrs and 1010 hrs
b) Engine speed
c) Course made good.

Q.3. At 1900 hrs a vessel steering a course of 300°T observes forward of beam Christianso (S) Lt. (55°19.5'N 015°11'E) to bear 7° nm. At 2030 hrs it observes Simrishamn Iso WRG (55°33.5'N 014°22'E) to bear 302°T. If the current was setting 000°T @ 2 kts throughout, find the position of the vessel at 1900 hrs and 2030 hrs?

Q.4. In DR position 55°18'N 013°51'E, a vessel observes following compass bearings:
a) Abbekas fishing light (55°23.5'N 013°36'E)   – 303°(C)
b) Ystad light (55°25.5'N 013°49'E)   – 014°(C)
c) Kaseberga light (55°23'N 014°04'E)   – 077°(C)

Find: a) Vessel's position   b) Deviation of ship's head

Q.5. At 1200 hours on 25th April, 1992 a point of land in Lat. 24°37'N Long 047°12'W bore 055°(T) dist off by radar 5 miles, she then sailed the following courses and distances.

Gyro Co.	Gyro Error	Distance	Wind Direction	Leeway
347°	1° High	111 M	SW	3°
001°	Through	47 M	W	Nil
187°	Out	27 M	W	1°

Find the estimated arrival position. If the final position by observation was 26°27.5'N 047°32.2'W, find the set and drift of the current experienced and the course and distance made good.

Q.6. Two vessels 45 nautical miles apart on the parallel of 40°30'N steam 180°T, at equal speeds, until the distance between them is 55 nautical miles. How far did each vessel steam?

Q.7. A lighthouse at Amherst labour (#2877) has a charted elevation of 33 m. What will be its actual elevation at 1830 hrs Standard time on 22nd March, 1992?

Q.8. Following notices to mariners (Adm. NM No. 533/2013) were received for chart No 5072. Do the necessary correction in the chart using correct symbols. (Use pencil only).
a) Insert "Spoil ground" in position 56°06.1'N 016°02'E
b) Insert "Special Mark" (Lt) in position 56°06.1'N 016°02.2'E
c) Shift the pilot boarding position from 55°12.8'N 015°03.2'E to 55°13.5'N 015°03.2'E

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PM PAPER   Date: - 3rd July-2025

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use chart No. 5072 (Flasterbo to Orland), Deviation Card no.3, HE 10 m and Variation 4° W, Engine Ship speed 12 knots, if not mentioned in the question.
2. Luminous range diagram may be provided if necessary.
3. Use Admiralty Tide Tables for 1992.
4. Position of landmarks are approximate and are to be used for identification only.

PART – A

Questions No. 1 is compulsory, attempt any two questions from remaining three.

(30 marks each)

Q.1. Consider you are on a fully loaded tanker with maximum draft of 19 m. (Normal Sea speed 15 knots). Plan a safe passage from Simrishamn pilot station (55° 33.5'N, 014° 24.0'E) to Kullagrund pilot station for deep draught tankers (55° 13.3'N, 013° 23.5'E), keeping in mind the UKC of MIN 2.0 MTR. Good visibility and strong N'ly winds prevails. Your vessel is fitted with all the required navigational equipments and all are in good working condition. Show clearly courses to be steered, alterations of course, wheel over position, and working condition. Show clearly courses to be steered, distance and all the waypoints on the chart recording their co-ordinators in the answer booklet as well. How long will this passage take basis steaming at sea speed?

Q.2 A vessel near Hammerode Lt. Ho. (55° 18'N 014° 47'E) observes the bearing of the Lt. Ho. as 137° (T). At the same time the vertical sextant angle was observed to be 12.6'. If the tide had fallen by 2m below MHWS and the index error was 2' on the arc, find the position of the vessel. Thereafter, with the current setting 345°(T) at 2 knots, the vessel steered a course of 258°(T). Find the course and speed made good and also the distance off from Sandharmmeren Lt. Ho. (55° 23'N 014° 21'E) when it is abeam to stbd.

Q.3 Vessel anchored off YSTAD observe the following:

ABBESKJ LIGHT   (55° 23'N 13° 37'E) - 298° (C)
YSTAD SOUTH   (55° 25'N 13° 49'E) - 009° (C)
KASEBERGA LIGHT   (55° 23'N 14° 04'E) - 078° (C)

Find the compass error and position of the vessel. From this position find a compass course to steer to pass Hammerodde lighthouse 55°18'N 014°47'E 2 miles off countering a current of 060° x 2 knots and a strong northerly wind causing 5° leeway.

Q.4 While steering a course of 228°(T) Olands Sodru Grund Racon light (56°04'N 016°42'E) was last sighted, in 2100 hrs, when visibility was 5 M only. At 2200 hrs. Utklippan Lt (55°57'N 015°41'E) was first sighted, visibility remaining the same. Current was known to be setting 013°(T) at 2.5 knots

throughout. Find the vessel's position at 2100 hrs and 2200 hrs. and also the time and position when Utklippan light was last sighted.

PART B:
All questions are compulsory. Questions 5, 6, 7 are for 30 marks each and Q.8 for 20 marks.

Q.5. On 13th Jan, the noon position was 18° 52' N 072° 52' E. The vessel then steamed.

Time	Course	Gyro error	Speed by log
1200	237°	1° H	15
a/c 1700	283°	1° L	16
a/c 2000	262°	0°	15
a/c 0400	197°	1°L	14.5
1200	197°	1°L	15

At 0200, clocks were retarded by one hour.
Find (i) The D R position at noon 14th Jan.
ii) If at noon the fix was 15° 50' N 068° 26' E find, Set and rate of current

Q.6. a) If a ship departs from position 46° 14'N, 125° 36'W on a course of 237°T and covers 7076', find the position reached (by Mercator Sailing).
b) A ship in position 41° 10'S 032° 45'W is steering a course of 090°T at a speed of 16 knots. Find the longitude reached after 22 hours of steaming.

Q.7. A vessel having a draft For'd 6 m, Aft 7 m wants to clear a bar (chart depth 6m), at Bombay (#4359) on 15th February 1992 with UKC of 2m. Find the earliest time in the evening when the vessel can do so.

Q.8. a) Enumerate the information available in the list of light for a particular lighthouse, how you will keep this publication updated.
b) Draw the following chart symbols in your answer sheet:
   i) Gas supply pipeline
   ii) Fish haven
   iii) Limit of Safety zone around offshore installation
   iv) Wreck, depth unknown, dangerous for surface navigation
   v) No bottom found until 100 M depth

*************************X***X*****************************

GOVERNMENT OF INDIA

AM Paper

Date: - 3ʳᵈ July-2025

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. **Use Admiralty Tide tables for 1992.**
2. **Use Chart No. 5056 (Start point to the Needles). Use Deviation Card No. 2. HE 10m and Variation as per chart, Ship speed 12 knot unless specified in the question.**
3. **Luminous range diagram may be provided if necessary.**
4. **Position of landmarks are approximate and are to be used for identification only.**

PART – A

Questions No. 1 is compulsory. Attempt any 2 questions from remaining 3.

(30 marks each)

Q.1 a) Describe briefly what you understand by Passage Planning?

b) How would you plan your passage after dropping Needles pilot (50° 38'N, 001° 39'W) to pick up Exmouth Pilot (50° 36'N, 003° 21.5'W) and list the Admiralty publications which you would prefer to.

Q.2 At 2000 hrs Channel Lt Vessel (49° 55'N, 002° 55'W) and East Channel Racon Buoy (49° 59'N, 002°29'W) were equidistant on the radar. Vessel was steering a course of 025°T at 12 kts. Wind was Northerly causing a leeway of 5°. A tidal stream was setting in the direction of 180°T at 2 kts. At 2220 hrs Bill of Portland Lt (50° 31'N, 002° 27'W) was found to be 10° off on the radar. Find CMG (Course Made good), SMG (Speed Made good) & position of the vessel at 2220 & 2000 hrs.

Q.3 At 2000 hrs Channel Lt Vsl (49° 55'N, 002° 55'W) was raised and at 2100 hrs the same light was last sighted when the meteorological visibility was 5' only. During this interval the vessel was steering 045°T at 11 kts. NW'ly wind was causing a leeway of 5°. Current was setting in a southerly direction at 2 kts. Find the following:

a) raising & last sighted distances of Channel Lt Vessel

b) Position of the vessel at 2100 & 2000 hrs. HE 4M.

Q.4 At 0200 hrs straight Pt. Lt. (50° 36.6'N & 003° 21.7'W) bore 300° (T) when the vessel crossed 30m contour. Find the ship's position. From this position find the course to steer to pass Bill of Portland Lt. (50° 31'N, 002° 27'W) 9' off to port. Engine speed 12 kts. Vessel experiencing a NE'ly wind causing a leeway of 5°, current setting 180° (T) x 2 kts.

Also find the time & position, when the vessel will pass Bill of PORTLAND light 9 off. Engine speed 9 kts.

ALL QUESTIONS ARE COMPULSORY: Questions 5,6,7 are for 30 marks each and Q.8 for 20 marks.

Q.5 A vessel sailed from lat. 27° 12'N, long. 178° 42' E doing 15 kts by engines. She steered 067° (C), (Dev. 3°E), for 10 hours. Course was then altered to 096° (C) (Dev.1°E), and this course was maintained for 8 hours, thereafter she steered 230° (C), (Dev. 3°W) for another 6 hours, find the position arrived, if she experienced a current setting 324° (T) at 2.5 knots throughout. Also find the course and distance she made good, Variation 7° W throughout.

Q.6 a) Find the total G.C. distance, the initial course from position 'A' 41° 00'S, 175° 00' E to Position 'B' 33° 00'S, 071° 30' W.
b) A vessel steams due east from 'A' in Long 060° W to Position 'B' in Long 020° 00' W. If the distance steamed is 1956 n.m, find the Latitude of 'A' and 'B'.

Q.7 Find the height of tide at 0900 hrs local time at dover on 3rd march.

Q.8 a) Write short notes on:-
i) Iso phase and occulting lights   ii) Cardinal Marks

b) White chart symbols:-
i) No bottom found at the depth of 50m   ii) depth of water 25m found by wire drag or wire swept,   iii) submarine cables   iv) Wind mill   v) drying height 0.5m

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GOVERNMENT OF INDIA

PM PAPER   Date: - 5ᵗʰ May-2025

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use chart No. 5047 (Bristol Channel). Deviation Card No. 2, Var 6°W.
2. Luminous range diagram may be provided if necessary.
3. Use Admiralty Tide Tables for 1992.
4. Engine speed 12 Knot if not mentioned in question.
5. Position of landmarks are approximate and are to be used for identification only.

PART – A

Questions No. 1 is compulsory, attempt any two questions from remaining three.

(30 marks each)

Q.1 Your ship is located in position 51°34'N, 004°59'W. She is required to reach a position 51°31'N, 003°53'W. Draft 13 meters, a maximum speed of 10 knots. She has only one working radar, the other bridge equipment is in good working order. Strong SW'ly gales & moderate visibility prevails. Prepare a safe passage plan to the given location, giving details on the chart & in the answer booklet.

Q.2 A vessel steering 283°(T), engine speed unknown, observes at 1000 hrs North Lundy lt ho (51° 12'N, 004° 40'W) bore 250°(T) and at 1030 hrs it bore 160°(T), the same light then bore 118°(T) at 1050 hrs. If the current was setting 222°(T) at 3 knots, find CMG, Engine speed and vessel's position at 1030 hrs and 1050 hrs.

Q.3 A vessel at anchor observed following bearings:
Worm Head pt (51° 34'N, 004° 20'W)   --- 100°(G)
Helwick Lt vessel (51° 31'N, 004° 25'W)   --- 207°(G)
DZ4 Fl. Y 5 sec (51° 36'N, 004° 30'W)   --- 297°(G)
Find Gyro error vessel's position.

Q.4 A vessel while steering a course of 035°(T) observes Lundy Island South Lt (51°09'N, 004° 39'W) for the first time at 2300 hrs, the visibility at this time was 5 miles. The same light obscured at 2336 hrs. If the current was setting 340°(T) at 2 knots.
Find a) the position at 2336 hrs and 2300 hrs.
b) Find the course and speed made good.

Q.5 Vessel steered following courses from 29th Oct noon to 30th Oct noon.

Duration	True Course	Distance NM
1200 – 1600 hrs	122°	52
1600 – 2200 hrs	090°	84
2200 – 0400 hrs	075°	72
0400 – 1200 hrs	105°	96

At 1730 hrs a south cardinal buoy in posn 35° 40S 135° 15W was observed 2 points on Port bow and at 1800 hrs it was abeam find course and distance made good and also the DR position on 30th Oct noon.

Q.6 Calculate GC distance, initial course and position of vertex of a Great Circle track from 42° 36'S 140°24'S 150°54'E.

Q.7 A feeder vessel lightly ruins aground over a 2m patch on the chart for BHARUCH on 10th March 1992 at 2021 hours UTC. Estimated her draft.

Q.8 Draw CLEARLY the following chart symbols in the answer booklet.
a) Sounding of Doubtful Depth
b) Overfalls
c) Radio Mast
d) Rock Awash at the level of the chart datum
e) Spoil Ground

*****************************X****X*****************************

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. **Use Admiralty Tide tables for 1992.**
2. **Use Chart No. 5048 (Start point to the Needles), Deviation Card No.2, Engine Speed 12 knots if not mentioned in the question.**
3. **Luminous range diagram may be provided if necessary.**
4. **Position of landmarks are approximate and are to be used for identification only.**

PART – A

Questions No. 1 is compulsory. Attempt any 2 questions from remaining 3.

(30 marks each)

Q.1 A vessel at anchor observes the following compass bearings:

a) Old Head of Kinsale Lt.	(51°36.2'N 008°32'W)	: 278°(C)
b) Roche's Pt Lt.	(51°47.5'N 008°15'W)	: 338°(C)
c) Bally cotton Isl. Lt	(51°49.5'N 007°59'W)	: 023°(C)

Find the vessel's position and the deviation on the ship's head if the variation was 6°W.

Q.2 While steering 056°(G), Old Head of Kinsale Lt. (51°36.3'N 008°31.8'W: F1 (2) 10s 72m 25m) at 1000 hrs bore 001°(G), at 1030 hrs bore 313°(G), at 1100 hrs bore 271°(G). Current setting W'ly, Gyro error 1°(H), Engine Speed 10kts.

Find the: a) Course & Speed made good   b) Position at 1000, 1030 & 1100 hrs
c) Drift of current

Q.3 At 1400 hrs, following compass bearings were observed by the vessel

Ballycotton Island Lt. (51°49.5'N, 007°59'W)	294°(C)
Capel Island (51°52.8'N, 007°51.2'W)	338°(C)
Ram Head (51°56.3'N, 007°42.4'W)	008°(C)

Determine ship's position and compass error.

Q.4 At 1800 hrs, while steering 251°(G), Coninbeg Racon 'M' (52° 02.4'N, 006° 39.4'W) was observed 10' off. At 1900 hrs Hook Head Racon 'K' (52° 07.4'N, 006° 55.8'W) bore 051° (G). Current was known to be setting S'ly @ 2 kts. Determine ship's position at 1800 & 1900 hrs. Gyro error 1°(H).

ALL QUESTIONS ARE COMPULSORY: Questions 5,6,7 are for 30 marks each and Q.8 for 20 marks.

Q.5 Following courses and distances were steamed by a vessel during 15 knots, between noon of 1st Feb till noon of 2nd Feb. The noon position on 1st Feb was observed to be 10°N 30°E.

Ships Time	Compass Course (deg)	Variation (deg) E/W	Deviation (deg) E/W
1200 – 1800	150	3°E	2°E
1800 – 2400	135	3°E	6°W
0000 – 0600	090	3°E	5°E
0600 – 1200	120	3°E	4°W

Clocks were advanced for 1 hr at between 0300 hrs. Current setting 240° x 2.5 kts was experienced throughout. Calculate the noon position arrived at on 2nd Feb when above courses were steered and distances steamed.

Q.6 Find Great circle distance, initial course and position of vertex from position 20°N 075° W to 45°N 050°W.

Q.7 A vessel drawing following drafts of Fwd 6.0m, Aft 7.0m has to clear the bar of charted depth of 6m at Bombay (#4359) on 15th Feb 1992 with UKC of 2m. Find the earliest time in the evening when the vessel can do so.

Q.8 In your answer script, draw neatly the following symbols (Use pencil only)
a) Wreck Mast Visible
b) Isolated Danger mark
c) Fairway buoy
d) Local magnetic anomaly upto 9 degrees either side
e) Radio calling in point.

*************************x***x*************************

GOVERNMENT OF INDIA

PM PAPER   Date: - 6th Mar-2025

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. **Use Admiralty Tide tables for 1992.**
2. **Use chart No. 5048 (Ireland-South coast). Deviation Card No. 1: HE 10m; Engine Speed 12 knots if not mentioned in the question, Variation 2° E.**
3. **Use luminous range diagram as necessary.**
4. **Position of landmarks are approximate and are for identification only.**

PART – A

Questions No. 1 is compulsory and attempt any 2 questions from remaining 3 questions of PART 'A'   **(30 marks each)**

Q.1 A vessel at anchor observes the following compass bearings:

a) Old Head of Kinsale Lt.   (51° 36.2'N 008° 32'W)   - 278° (C)

b) Roche's Pt. Lt.   (51° 47.5'N 008° 15'W)   - 338° (C)

c) Ballycotton Isl. Lt.   (51° 49.5'N 007° 59'W)   - 023° (C)

Find the vessel's position and the deviation on the ship's head if the variation was 6°W.

Q.2 A vessel on a course of 270° (C) observes at 2000 hrs Kinsale-A East Platform (51° 22'N, 007° 57'W) to bear 218° (C). At 2020 it bore 183° (C) and at 2040 hrs it again bore 137° (C) while the Kinsale-B West platform (51° 21.5'N 008° 11'W) bore 172° (C). Find:

a) Ship's position at 2000 hrs and 2040 hrs.

b) Set and drift of the current.

c) Course and speed made good.

Q.3 At 1800 hrs after dropping Pilot at Waterford harbor Pilot station (52° 09.2'N 006° 58.2'W) a vessel steered a course of 180° (T). Meteorological visibility was 5nm throughout.

Master altered course as soon Pilot lookout is last sighted, to pass Mine head light (51° 59.5'N, 007° 35'W) 5nm on her Stbd side. If current was setting 120° (T) at 2 kts throughout, find the time of alteration of course and the second course steered.

Q.4 An Oil tanker with maximum draft of 12m. Disembarked her pilot at VLCC pilot station in position 51° 45'N 008° 15.2'W. Plan a passage from this position to join the North East bound lane of St. George Channel TSS. Course and distances for each leg, alteration points, way points, No-Go Areas, parallel indexing, W/O point, R.F. Away and S.B. Engines to be marked on the chart and written on the answer sheet.

All questions are compulsory. Questions 5, 6, 7 are for 30 marks each and Q.8 for 20 marks.

Q.5 On 13th Jan a lighthouse in position 20° 30'S, 179° 30'W bore 125° T, range 20 miles. Ship set following courses thereafter. Find the course and distance made good noon to noon and EP on 14th Jan noon.

	C Co	Dev	Var	Wind	Leeway	Log
13th N/Co	220°	3°E	3°E	Sly	2°	0
2000 hrs A/C	162°	Nil	3°E	Sly	3°	100
14th 0800 hrs A/C	320°	3°E	4°E	Ely	2°	220
1200 hrs A/C	140°	3°E	4°E	Ely	2°	270

A SW x W ly current @ 2kts was experienced throughout. Check were advanced 1 hr at midnight and ship had engine breakdown from 0430 hrs to 0500 hrs.

Q.6 Calculate the Great Circle distance, initial & final course between 10°N 040°E and 30°N 100°E.

Q.7 Find the earliest time to sail out of Shimonoseki (ATT Vol-III) after 0700 hours in the morning on 19th Mar 1992. Master wants a height of tide of at least 2 metres at the time of sailing.

Q.8 In your answer script, draw neatly the following symbols (Use pencil only):
a) Wreck-Mast Visible
b) Isolated Danger mark
c) Fairway buoy
d) Local magnetic anomaly up to 9 degrees either side
e) Radio calling in point

***************************x****x****************************

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. **Use Admiralty Tide tables for 1992.**
2. **Use Chart No. 5047, Deviation Card No.3, Spd 12 knots when not mentioned in the question.**
3. **Luminous range diagram may be provided if necessary.**
4. **Position of landmarks are approximate and are to be used for identification only.**

PART – A

Questions No. 1 is compulsory. Attempt any 2 questions from remaining 3.

(30 marks each)

Q.1 Your ship is located in position 51° 34'N, 004° 59'W. She is required to reach a position 51° 31'N, 003° 53'W. Draft 13 meters, a maximum speed of 10 knots. She has only one working radar, the other bridge equipment is in good working order. Strong SW'ly gales & moderate visibility prevails. Prepare a safe-passage plan to the given location, giving details on the chart & in the answer book.

Q.2 2 FG Vert. Lts. at 'Ilfracombe' Pilots (51° 12.6'N, 004° 06.7'W) were observed to bear 190° (T) at 2120 hours, 160° (T) at 2138 hours, and again 125° (T) at 2207 hours. If the ship had been steering 250° (T) at 13 knots & the tide is setting North, find its rate. Also, find CMG, SMG & the ship's positions at all three observations.

Q.3 On 15th August 2010 a ship observed the following bearings:

i) Helwick Lt. v/l. (51° 30.3'N, 004° 25.5'W)   - 083° (C)

ii) Caldey Is. Lt. Ho. (51° 37.9'N, 004° 41.0'W)   - 004° (C)

iii) St. Govan Lt. V/L. (51° 30.6'N, 004° 59.7'W)   - 232° (C)

Find the deviation of the compass on this heading.

Q.4 At 2100 hours, Helwick Lt. v/l (51° 30.6'N, 004° 25.5'W) was forward of the beam at 5 miles by radar while the ship steered 100° (T). At 2130 hours Scarweather Lt. V/L (51° 26.8'N, 003° 56.0'W) bore 080° (T). The current was setting 130° (T) at 4 knots and engine speed was maintained at 16 knots. Find the ship's position at 2100 and 2130 hours.

PART B:

ALL QUESTIONS ARE COMPULSORY: Questions 5,6,7 are for 30 marks each and Q.8 for 20 marks.

Q.5 Vessel steered the following courses from 29 Oct noon to 30 Oct noon:

Duration	True Course	Distance NM
1200-1600 hrs	122°	52
1600-2200 hrs	090°	84
2200-0400 hrs	075°	72
0400-1200 hrs	105°	96

At 1730 hrs a south cardinal buoy in posn 35° 40' S 135° 15' W was observed 2 points on port bow and at 1800 hrs it was abeam. Find course and distance made good and also the DR position on 30 Oct noon.

Q.6 A vessel sails on an Initial Great Circle course of 278° (T) from 36° 11'N, 177° 17' W. Her course was 279° (T) when she had sailed for 1/3rd of the total voyage distance. Find the position of her destination port.

Q.7 Find the height of tide at the port of Wailingding Dao (#7086), on 10th February 1992, at 2200 hours.

Q.8 a) What are the contents of BA Weekly notices to mariners?

b) Draw the following BA chart symbols neatly in your answer sheets:

   i. Depth at chart datum to which area have been swept by wire drag

   ii. Wreck, depth unknown, dangerous for surface navigation

   iii. Anchoring prohibited

   iv. Isolated danger mark.

*************************X***X*****************************

TIME: 3 Hours	PASS MARKS: 140	MAX. MARKS: 200

Notes:
1. Use chart No. 5072, Deviation Card No. 2, HE 12 m and Variation 6°W. Engine speed 12 knot, if not given in the question.
2. Luminous range diagram may be provided if necessary.
3. Use Admiralty Tide Tables for 1992.
4. Position of landmarks are approximate and are to be used for identification only.

PART – A

Questions No. 1 is compulsory, attempt any two questions from remaining three.

(30 marks each)

Q.1. Your vessel, a tanker with draft of 12.5 M and speed of 12 knots, drops Pilot at Simrishamn Pilot station (55° 33.5'N, 014° 24'E) and is bound for Kullagrund Pilot station (55° 13.3'N, 013° 23.5'E), in restricted visibility. Vessel is equipped with all navigational equipment. Plan a safe passage. Courses to be plotted on the chart, with clear marking of course, distance and alteration points for each leg of passage. Passage plan to be written in Tabular format in your answer sheet.

Q.2. A vessel in D.R. 55° 09'N, 015° 22'E, steering 307° (T) first sights Svaneke Light House (55° 08'N, 015° 10'E) at 2000 hours in Meteorological visibility of 2 NM. The vessel is experiencing current setting North at 3.5 knots and NE'ly wind causing 3° leeway. Thereafter the visibility improves and at 2100 hours, the vessel observes Hammerode Light House and the Christianso Light house on reciprocal bearings. Find Course Made Good, Speed Made Good and the vessel's positions at 2000 hours and 2100 hours.

Q.3. a) A vessel steering 000° (T) observes Hammeren Light House (55° 17'N, 014° 45'E) bearing 045° (T) at 0900 hours, the same light house is abeam at 0927 hours. Find the position of the vessel when abeam.

b) From the position obtained above find the course to steer and engine speed required to reach Taggen Pilot station (45° 53.4'N, 014° 35.7'E) at 1310 hours, if current was setting 225° (T) at 3 knots. Also, find the time and distance off when Simrishamn Light House will be abeam.

Q.4. A vessel at anchor observes following compass bearings at 1200 hours:

Christianso Lt (55° 19'N, 015° 11.5'E)	057° (C)
Svaneke Lt (55° 08'N, 015° 10'E)	167° (C)
Hammerode Lt (55° 18'N, 014° 47'E)	284° (C)

Find a) Ship's position   b) Compass error, and   (c) If Variation is 6°W, find the deviation.

PART B:

All questions are compulsory. Questions 5, 6, 7 are for 30 marks each and Q.8 for 20 marks.

Q.5. On 13th Jan, the noon position was 18° 52' N 072° 52' E. The vessel then steamed

Time	Course	Gyro error	Speed by log
1200	237°	1° H	15
a/c 1700	283°	1° L	16
a/c 2000	262°	0°	15
a/c 0400	197°	1°L	14.5
1200	197°	1°L	15

At 0200, clocks were retarded by one hour.

Find (i) The D R position at noon 14th Jan.

If at noon the fix was 15° 50' N 068° 26' E find, (ii) Set and rate of current

Q.6. Calculate GC distance, initial course and position of vertex of a Great Circle track from 42° 36'S 140° 24'W to 26° 24'S 150° 54'E.

Q.7. Find the height of tide at the port of Wallingding Dao (#7086), on 10th February 1992, at 2200 hours.

Q.8. Draw the following chart symbols in your answer sheet:

a) Gas supply pipeline

b) Fish haven

c) Limit of Safety zone around offshore installation

d) Wreck, depth unknown, dangerous for surface navigation

e) No bottom found until 100 M depth   (20 marks)

*************************X***X*****************************

GOVERNMENT OF INDIA

Date: - 3rd Jan-2025

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. **Use Admiralty Tide tables for 1992.**
2. **Use Chart No. 5056 (Start point to the Needles), Deviation Card No.4, HE 12m and variation as per chart. Ship speed 12 knots, if not given in the question.**
3. **Luminous range diagram may be provided if necessary.**
4. **Position of landmarks are approximate and are to be used for identification only.**

PART – A

Questions No. 1 is compulsory. Attempt any 2 questions from remaining 3.

(30 marks each)

Q.1 Your vessel having a 10m draft drops pilot at Exmouth pilot station (50°36'N 003°22'W) and is bound for Portland harbour (50°36'N 002°25'W). Vessel is fitted with all required navigational equipment's including ECDIS. Plan a safe passage for the intended voyage. Write the synopsis of passage planning on your answer sheet.

Q.2 Following 3 bearing were observed off Bill of Portland Lt. (50°30.8'N 002°27.4'W):
- 1000 hrs   340° (T), Vessel was 10' of from Bill of Portland light.
- 1024 hrs   002° (T),
- 1054 hrs   028° (T),

Course steered by vessel was 265° (T), engine speed was 12 knots. Find CMG, set and drift of vessel and vessel's position at 1054 hrs.

Q.3 A vessel on a course 290° (C), observes East Channel Lt. (49°59'N 002°29'W) bearing 190° (C) and Channel Lt. vessel bearing 227° (C) at same time. Find Ship's position from this position and compass course to steer to have Start point light (50°36.5'N 003°22'W) 30° on her port bow when 10 miles off.

Q.4 At 2000 hrs Start point Lt. (50°36.5'N 003°22'W) was 6' off and at 2100 hrs Berry Head Lt. (50°24.5'N 003°28.8'W) was 5' off on Radar. During the above period, vessel steered a course of 020° (T) at 11 kts in a northerly wind causing a leeway of 5°. The current was setting 180° (T) at 2 kts. Find CMG, SMG, Position of vessel at 2000 & 2100 hrs.

PART B:

ALL QUESTIONS ARE COMPULSORY: Questions 5,6,7 are for 30 marks each and Q.8 for 20 marks.

Q.5 At 1200 hrs on 25th June 1992, a Lt. Ho (Lat 24°37'N Long 047°12'W) bore 057° (T), dist. off by radar 5.5 miles, she then sailed following courses and distances.

Gyro Co.	Gyro Error	Distance	Wind direction	Leeway
347°	1° High	111 NM	SW	3°
001°	1° High	047 NM	W	Nil
187°	1° High	027 NM	W	1°

Find estimated arrival position. If final position by observation was 26°27.5'N 047°32.2'W, find set and drift of current experienced and course and speed made good.

Q.6 Find the Initial course, final course and position of Vertex of a Great circle track from position 30°N 060°E to 50°S 155°E.

Q.7 Find times and height of HW and LW on 1st March 1992 at Navlakhi (#4331).

Q.8 Draw the following chart symbols (5011) in the answer sheet:

a. Safe water mark

b. Isolated danger mark

c. Wreck dangerous to surface navigation

d. Over falls, tide rips

e. Rock awash at chart datum

f. Single Point Mooring (Fixed)

****************************x***x*****************************

GOVERNMENT OF INDIA

PM PAPER   **Date: - 5th Nov-2024**

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use Admiralty Tide tables for 1992.
2. Use Chart No. 5048, Deviation Card No.2, Engine speed 12 knot, HE 12m and Variation 5°W unless specified in the question.
3. Use luminous range diagram as necessary.
4. Position of landmarks are approximate and are for identification only.

PART – A

Questions No. 1 is compulsory and attempt any 2 questions from remaining 3 questions of PART 'A'   **(30 marks each)**

Q.1 A Container vessel with maximum draft of 10 m disembarked her pilot at Youghal Bay anchorage in position 51°53.6'N, 007°51'W. Plan a safe passage from this position to join North East bound lane of St. Georges Channel TSS. Vessel experiencing strong southerly Gale Wind. Prepare passage plan document with necessary details in the answer sheet in tabular format.

Q.2 A vessel steering 244°(T) observes Roche's Point Lt. Ho (51°48'N, 008°15'W) light turn from red to white at 2100 hours and from white to red at 2200 hours. Find the vessel's position at 2200 hours if the current was setting 296°(T) at 3 knots.
From 2200 hours position find the course to steer if the vessel now intends to pass Old head of Kansale light house 3 miles on her starboard, current remaining the same, the wind is now SE'ly causing 4° leeway.

Q.3 A vessel steering 022°(T) observes following bearings of Hook head Light house
     1000 hours 007°(T)
     1040 hours 326°(T)
     1100 hours 288°(T)
If the current was setting at 158°(T). Find Course Made Good, Speed Made Good, Rate of current and position at 1000 hours and 1100 hours.

Q.4 a) A vessel passed 'M5 Buoy (51°41.4'N, 006°42.2'W) 3 Miles to SW at 1000 hours. She is to pick up her sea pilot sharp at 1230 hours from 2 miles south of 'Hook Head' Light House (52°07.4'N, 006°55.8'W). Find the Gyro Course to Steer (error 4°Low) and engine speed to keep if the current sets West at 3 knots and Westerly winds are causing 5 of leeway.
b) Find the time and position when 'Coningberg' Light vessel (52°02.4'N, 006°39.4'W) will be absent.

PART B:

All questions are compulsory. Questions 5, 6, 7 are for 30 marks each and Q.8 for 20 marks.

Q.5 On the 13th Mar 1992 at 1200 hours, the light house in position 02°26'S, 178°37'W is 9 miles and its bearing is 200°(T). The ship then sailed at 12 knots on the following courses:

Time	Compass	Deviation	Variation	Wind	Leeway
1200 hours	295°	2°W	3°E	SW	2°
2000 hours	326°	4°W	3°E	SW	4°
0400 hours	345°	5°W	3°E	W	4°
1200 hours	010°	3°W	3°E	W	3°

At 1900 hours the ship stopped for 1 hour and at 2400 hours clocks were retarded by 30 minutes. Calculate the estimated position at 1200 hours on the 14th Mar 1992.

Q.6 Find the initial course, final course and great circle distance from position 49°50'N, 005°15'W to position 32°29'N, 064°00'W.

Q.7 Find the High + Low water at Richmond (#2821) on 29th March 1992.

Q.8 Draw the following symbols are used on BA charts.   (20 marks)
a) East Cardinal Mark
b) Anchoring prohibited
c) Fairway buoy
d) Rock awash at level of Chart datum
e) Wreck over which the depth has been obtained by sounding but not by wire sweep.

***************************x***x****************************

GOVERNMENT OF INDIA

AM Paper

Date: - 5ᵗʰ Nov-2024

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use Admiralty Tide tables for 1992.
2. Use Chart No. 5047, MMD Dev Card No.2, Var 6 W, HE 12 M, Spd 12 knots when not mentioned in the question.

PART – A

Questions No. 1 is compulsory. Attempt any 2 questions from remaining 3.

(30 marks each)

Q.1 A vessel having a draft of 12M drops pilot at Bristol Pilot Grounds (51°21'N, 003°19'W) in gale force winds and is bound for Swansea (51°32'N, 003°57'W) while the vessel is equipped with ARPA, Echo Sounder, Doppler log. In view of the above, plan a safe passage, your company UKC policy, of 1 meter to be maintained at all times.

Q.2 A vessel steering 283°(T), engine speed unknown, observes at 1000 hrs North Lundy. lt ho (51°12'N, 004°40'W) bore 250°(T) and at 1030 hrs it bore 160°(T), the same light then bore 118°(T) at 1050 hrs. If the current was setting 222°(T) at 3 knots, find CMG, Engine speed and vessel's position at 1030 hrs and 1050 hrs.

Q.3 A vessel at anchor observed following bearings:

Worm Head Point (51°34'N, 004°20'W)   –   100°(G)

Helwick Lt vessel (51°31'N, 004°25'W)   –   207°(G)

DZ4 FLY 5 sec (51°36N, 004°30'W)   –   297°(G)

Find the Gyro error and the vessel's position.

Q.4 A vessel while steering a course of 035°(T) observes Lundy Island South Lt (51°09'N, 004°39'W) for the first time at 2300 hrs, the visibility at this time was 5 miles. The same light obscured at 2336 hrs. If the current was setting 340°(T) at 2 knots.

Find: a) The position at 2336 hrs and 2300 hrs

b) Find the Course and Speed made good.

PART B:

ALL QUESTIONS ARE COMPULSORY: Questions 5,6,7 are for 30 marks each and Q.8 for 20 marks.

Q.5 At noon on 04th January, a light house in position 28°48.5'N, 178°25.0'W, bore 063°(T) distance 11.0'. Following courses were then steered by Gyro Compass (Gyro Error 3°(high) by the ship.

Date & Time	Course°G	Engine Speed
Jan. 04 1200 hours	333°G	16.2 knots
Jan. 04 1400 hours	310°G	14.8 knots
Jan. 04 2400 hours	264°G	15.0 knots
Jan. 05 1030 hours	206°G	14.6 knots

Engines remained stopped from 1800 to 2100 hours. Clocks were retarded by 30 minutes at 0100 hours. Current setting Se'ly at 2 knots was experienced throughout. Estimate the position on 05th Noon, CMG and DMG.

Q.6 Calculate GC distance, initial course and position of vertex of a Great Circle track from 42°36'S 140°24'W to 26°24'S 150°54'E.

Q.7 A feeder vessel lightly runs aground over a 2m patch on the chart for BHARUCH on 10th March 1992 at 2021 hours UTC. Estimate her draft.

Q.8 Draw Clearly the following chart symbols in the answer booklet.

a) Sounding of Doubtful Depth

b) Overfalls

c) Radio Mast

d) Rock Awash at the level of the chart datum

e) Spoil Ground

*****************************X***X***************************

TIME: 3 Hours	PASS MARKS: 140	MAX. MARKS: 200

Notes:
1. Use Admiralty Tide tables for 1992.
2. **Use Chart No. 5048 (Start point to the Needles)**, Use Deviation Card No.2, Engine speed 12 knot, unless specified in the question.
3. Use luminous range diagram as necessary.
4. Position of landmarks are approximate and are for identification only.

PART – A

Questions No. 1 is compulsory and attempt any 2 questions from remaining 3 questions of PART 'A'   (30 marks each)

Q.1 Vessel dropped pilot at $51^O45'$N $007^O15'$W. Her max. draft is 14m and is bound for North East bound lane of St. Georges Channel TSS. Max. engine speed 13 kts. Visibility is 8 miles with light rains. Vessel is equipped with all latest navigational aids. Plan a safe passage for above situation indicating courses, distances, waypoints other required information etc. on the chart and in answer sheet.

Q.2 While steering 056^O(G), Old Head of Kinsale Lt. ($51^O36.3'$N $008^O 31.8'$W: Fl (2) 10s 72m 25m) at 1000 hrs bore 001^O(G), at 1030 hrs bore 313^O(G), at 1100 hrs bore 271^O(G). Current setting W'ly, Gyro error 1^O(H), Engine Speed 10 kts. Find the
a) Course & Speed made good
b) Position at 1000, 1030 & 1100 hrs
c) Drift of current

Q.3 At 1400 hrs, following compass bearings were observed by the vessel
- Ballycotton Island Lt. ($51^O49.5'$N, $007^O59'$W) 294^O(C)
- Capel Island ($51^O 52.8'$N, $007^O 51.2'$W) 338^O(C)
- Ram Head ($51^O 56.3'$N, $007^O 42.4'$W) 008^O(C)

Determine ships position and compass error.

Q.4 At 1800 hrs, while steering 251^O(G), Coninbeg Racon 'M' ($52^O 02.4'$N, $006^O 39.4'$W) was observed 10' off. At 1900 hrs Hook Racon 'K' ($52^O 07.4'$N, $006^O 55.8'$W) bore 051^O(G). Current was known to be setting S'ly @2kts. Determine ship's position at 1800 & 1900 hrs. Gyro error 1^O(H).

PART B:

ALL QUESTIONS ARE COMPULSORY. Questions 5, 6, 7 are for 30 marks each and Q.8 for 20 marks.

Q.5 Following courses and distances were steamed by a vessel doing 15 knots, between noon of 1st Feb till noon of 2nd Feb. The noon position on 1 Feb was observed to be 10^ON 30^OE.

Ship Time	Compass Course (deg)	Variation (deg) E/W	Deviation (deg) E/W
1200 – 1800	150	3^OE	2^OE
1800 – 2400	135	3^OE	6^OW
0000 – 0600	090	3^OE	5^OE
0600 – 1200	120	3^OE	4^OW

Clocks were advanced for 1 hr at between 0300 hrs. Current setting 240° x 2.5 kts was experienced throughout. Calculate the noon position arrived at on 2nd Feb when above courses were steered and distances steamed.

Q.6 Find Great circle distance, Initial course and position of vertex from position 20^ON 075^OW to 45^ON 050^OW.

Q.7 A vessel drawing following drafts of Fwd 6.0m Aft 7.0m has to clear the bar of charted depth of 6m at Bombay (#4359) on 15th Feb 1992 with UKC of 2m. Find the earliest time in the evening when the vessel can do so.

Q.8 Draw the following symbols are used on BA charts. (20 marks)
a) Fairway buoy
b) East Cardinal Mark
c) North Cardinal Mark
d) Submarine Power Cable
e) Isolated Danger Mark

******************************x***x*****************************

GOVERNMENT OF INDIA

AM Paper   **Date: - 5ᵗʰ Sept-2024**

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

<u>Notes</u>:
1. Use Admiralty Tide tables for 1992.
2. **Use Chart No. 5047**, Engine Speed 12 knots if not mentioned in question.
3. Use luminous range diagram as necessary.
4. Position of landmarks are approximate and are for identification only.

PART – A

Questions No. 1 is compulsory and attempt any 2 questions from remaining 3 questions of PART 'A'   (30 marks each)

Q.1 Your vessel is having a draft of 11 mtrs and a speed of 12 kts. Your vessel is equipped with Radar, ARPA, GPS and Doppler. The ECDIS is not in operation.

Plan a safe passage from Port Talbot Pilot Station (51° 29.0'N 004° 00.0'W) to Bristol Pilot station (51° 21.0'N 003° 19.0'W) taking into account fishing traffic in the area and visibility of 3 miles for the entire route.

Q.2 Nash Point Lt. (51° 24.2'N, 003° 33.0'W) bore 016^O(T) distance off 5.2' at 2000 hrs. Find the course to steer and course to make good from this position so as to first sight Scarweather Lt. Vl. (51° 27.1'N, 003° 56.2'W) right ahead. Meteorological visibility 5 miles, current setting 180^O(T) rate 3 kts.

Q.3 A vessel steering 035^O(T) observes Hartland Point (51°01.0'N, 004° 32'W) to bear 078^O(T) at 2000 hrs. The same light bore 123^O(T) at 2020 hr. At 2050 hrs the same light bore 190^O(T) while at the same time Lundy lt. (51° 09.5'N, 004° 39'W) bore 283^O(T). Find the course made good, speed made good and the position at 2000 hrs.

Q.4 From a vessel at anchor the following bearings were observed:

Watch Tower (51° 42.0'N 004° 20'W)	051^O(C)
Rhosssili Downs Tower (181) (51°35'N 004° 17'W)	111^O(C)
Helwick Lt. Vsl. (51°31'N 004° 25'W)	175^O(C)

Find the vessel's position and the Deviation for the ship's Head if the Variation was 6°W.

ALL QUESTIONS ARE COMPULSORY: Questions 5,6,7 are for 30 marks each and Q.8 for 20 marks.

Q.5 On 13th March 1992 at 1200 hrs, the lighthouse in position 02° 26'S, 178° 37'W was 9 miles off and its bearing was 200°(T). The ship then sailed at 12 knots on the following courses:

Time from	Compass Course	Deviation	Variation	Wind	Leeway
1200	295°	2°W	3°E	SW	2°
2000	326°	4°W	3°E	SW	4°
0400	345°	5°W	3°E	W	4°
1200	010°	3°W	3°E	W	3°

At 1900 hrs the ship stopped for 1 hour and at 2400 clocks were retarded by 30 minutes. Calculate the estimated position at 1200 hrs on 14th March 1992.

Q.6 Find the distance, initial course and the final course on great circle from position 24° 00' N 074° 15'W to 46° N 053° 45'W.

Q.7 Calculate the UKC for a vessel drawing draft of F = 9 m and A = 10m. When she passes over shoal charted 10m at St. John (Att Vol II. #2864) at 0400 on 7th Feb 1992.

Q.8 Draw the following chart symbols:
a) Isolated Danger Mark
b) Anchoring Prohibited
c) Single Point Mooring (Fixed)
d) Wreck with Mast Visible

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GOVERNMENT OF INDIA

PM PAPER   Date: - 4ᵗʰ July-2024

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use Admiralty Tide tables for 1992.
2. **Use Chart No. 5056 (Start point to the Needles)**, Use Deviation Card No.2, HE 10m and Variation as per Chart. Ship speed 12 knot, unless specified in the question.
3. Use luminous range diagram as necessary.
4. Position of landmarks are approximate and are for identification only.

PART – A

Questions No. 1 is compulsory and attempt any 2 questions from remaining 3 questions of PART 'A'   (30 marks each)

Q.1 Your vessel having a 10m draft drops pilot at Exmouth pilot station (50°36'N, 003°22'W) and is bound for Portland harbour (50° 36'N, 002° 25'W). The vessel is fitted with all required navigational equipment including ECDIS. Plan a safe passage for the intended voyage. Write the synopsis of passage planning on your answer sheet.

Q.2 Vessel in position 50°15'N, 003°W at 2000 hrs, find the course to steer to first sight Bill of Portland Lt right ahead counteracting a tidal stream running at D. At what time & position the above Lt. will be first Sighted. HW at Devenport at 2330 hrs at Spring tide. HE 9m, Met. Visibility 2M, Engine speed 12 kts.

Q.3 At 1200 hrs, a Vessel at anchor was equidistant from Straight point Lt. (50°36.4'N, 003° 21.4'W) and Ness Light (50° 32.0'N, 003° 30'W) and at the same time Straight point Lt. (50° 36.4'N, 003° 21.4'W) and Hope's Nose point (50° 28.0'N, 003° 8.6'W) were on reciprocal bearing of (028G – 208 G). Find ship's position.
From this position, find Gyro Co to steer and engine speed to reach Tor bay deep sea pilot in one-hour time if current was setting E'ly at 2 knots and N'ly wind was causing leeway of 3° deg.

Q.4 At 1400 hrs, a vessel steering 290°(C) observe East Channel Lt. (49° 59'N, 002° 29'W) bearing 177°(C), at the same time Channel Lt. vessel bore 239°(T). Find ship's position. From this position set a course to pass 4' north of channel Lt. vessel if current was setting 200°T at 2.5 Kts and N'ly wind was causing a leeway of 3°. Find true course to steer and time when Channel Lt. will be abeam. (Var 7°W, Dev Card 2, Eng speed 12 knots).

Q.5 On 23rd Sept at Noon Lt. Ho. (25° 50'N, 126° 30'E) bore 004^O(C), distance 10 n.m. The Vesel steered following courses:

	Comp Co.	Var.	Dev	Leeway	Wind	Log
1200h.	190°	6°W	2^{O}E	3°	SSE	000
2000h	ENGINES STOPPED TILL 2030 HRS			080 (LOG HAULED)		
2030h	185°	5°W	NIL	5°	E	RESET TO ZERO
24th 1200h	340°	2^{O}W	2^{O}W	1^O	N	132'

Current was setting 300 T at 1.5 kts throughout. Clocks were advanced by 1 hour at midnight. Find course and distance made good and arrival noon position.   (30 Marks)

Q.6 Find great circle distance, Initial course, final course between 08° 05'N, 078° 10'E and (33° 55'S, 025° 35'E).

Q.7 Find HW and LW heights and times for Gentbrugge (1539) on 4th April 1992.

Q.8 Draw the chart symbols which are used on B.A. Chart for the following:
i) Isolated Danger Mark with Light
ii) Limit of Safety zone around offshore installation.
iii) South Cardinal Buoy with Light
iv) Wreck Dangerous for Surface Navigation
v) Two-way Radio Reporting point in NW bound Channel.

****************************x***x****************************

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use Admiralty Tide tables for 1992.
2. Use Chart No. **5072**, Deviation Card No.2, HE 12 m. Engine Speed 12 knots if not mentioned in question. Variation 6°W.
3. Use luminous range diagram as necessary.
4. Position of landmarks are approximate and are for identification only.

PART – A

Questions No. 1 is compulsory and attempt any 2 questions from remaining 3 questions of PART 'A'   **(30 marks each)**

Q.1 Your vessel a tanker with draft of 12.5m and speed of 12 knots, drops Pilot at Simrishman Pilot station (55° 33.5'N, 014° 24'E) and is bound for Kullagrund Pilot station (55° 13.3'N, 013° 23.5'E), in restricted visibility. Vessel is equipped with all navigational equipment. Plan a safe passage. Courses to be plotted on the chart, with clear marking of course, distance and alteration points for each leg of passage. Passage plan to be written in Tabular format in your answer sheet.

Q.2 A vessel in D.R. position 55°09'N, 015°22'E, steering 307^O(T) first sights Svaneke Lt. Ho. (55° 08'N, 015° 10'E) at 2000 hrs in Meteorological visibility of 2 miles. The vessel is experiencing current setting North at 3.5 knots and NE'ly wind causing 3° leeway. Thereafter the visibility improves and at 2100 hrs the vessel observes Hammerodde Lt. Ho. and the Christianso Lt. Ho. on reciprocal bearings. Find CMG, SMG and the vesssel's positions at 2100 hrs and 2000 hrs.

Q.3 a) A vessel steering 000^O(T) observes Hammeren Lt. Ho. (55°17'N, 014°45'E) bearing 045^O(T) at 0900 hrs, the same lt ho. is abeam at 0927 hrs. Find the position of the vessel at 0927 hrs.

b) From the position obtained above find the course to steer and engine speed required to reach Taggen Pilot stn (55°53.4'N, 014°35.7'E) at 1310 hrs, if current was setting 225^O(T) at 3 knots. Also, find the time and distance off when Simrishamn Lt. Ho. will be abeam.

Q4) While steering a course of 228^O(T) Olanda Sodra Grand Racon light (56°04'N,016°42'E) was list sighted at 2100 hrs, when visibility was 5 M only. At 2200 hrs Utklippan Lt. (55°57'N, 015°41'E) was first sighted, visibility remaining the same. Current was known to be setting 013^O(T) at 2.5

knots throughout. Find the vessel's position at 2100 hrs and 2200 hrs and also the time and position when Utklippan light will be last sighted.

PART B:

ALL QUESTIONS ARE COMPULSORY: Questions 5,6,7 are for 30 marks each and Q.8 for 20 marks.

Q.5 On 13th Jan, the noon position was $18^O52'N$, $072^O52'E$. The vessel then steamed.

Time	Course	Gyro error	Speed by log
1200	237°	1^OH	15
a/c 1700	283°	1^OL	16
a/c 2000	262°	0°	15
a/c 0400	197°	1^OL	14.5
1200	197°	1^OL	15

At 0200, clocks were retarded by one hour.

Find (i) The D R position at noon 14th Jan.

(ii) If at noon the fix was $15^O 50'N$ $068^O 26'E$. find Set and rate of current.

Q.6 Calculate distance, initial course and position of vertex of a Great Circle track from $42^O36'S$ $140^O24'W$ to $26^O24'S$ $150^O54'E$.

Q.7 A vessel having a draft For'd 6 m, Aft 7 m wants to clear a bar (charted depth 6 m), at Bombay (#4359) on 15th February 1992 with UKC of 2 m. Find the earliest time in the evening when the vessel can do so.

Q.8 a) Enumerate the information available in the List of light for a particular lighthouse, how you will keep this publication updated.

b) Draw the following chart symbols neatly in your answer sheet:

i) Gas supply pipeline.

ii) Fish haven

iii) Limit of Safety zone around offshore installation

iv) Wreck, depth unknown, dangerous for surface navigation

v) No bottom found until 100 M depth.

*****************************X***X*****************************

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use Admiralty Tide tables for 1992.
2. **Use Chart No. 5048**, Deviation Card No.2, HE 12m, Engine Speed 12 knots if not mentioned in the question, Variation 5°W.
3. Use luminous range diagram as necessary.
4. Position of landmarks are approximate and are for identification only.

PART – A

Questions No. 1 is compulsory and attempt any 2 questions from remaining 3 questions of PART 'A'   **(30 marks each)**

Q.1 A container vessel with maximum draft 15.0 m drops pilot at Cork Harbour pilot station (51° 45.0'N, 008° 15'W) and is bound for Liverpool through St. George's channel TSS. Vessel is equipped with Radar, ARPA, GPS and echo sounder. Plan a safe passage from pilot station to join the NE bound lane of St. George's channel TSS. Plot the courses and distances on the chart with clear marking of course alteration point. Where in brief the synopsis of passage planning in the answer sheet.

Q.2 From position 5 nm South of Old Head of Kinsale Lt. Ho (51° 36.4'N, 008° 32'W) at 2000 hrs a vessel sailed on a certain course to first sight Bally cotton Island (51° 49.4'N, 007° 59'W) Lt right ahead with current setting SE'ly at 2 Kts in Meteorological visibility 5nm. Find the course that the vessel was steering from 2000 hrs and time when the Baily cotton light will be observed right ahead. Ship's speed 9 Kts, HE = 12 mtrs.

Q.3 At 1000 hrs an observer observed the following: - Hook head Lt (52° 07.3'N, 006° 55.8'W) and Conning beg Lt Vsl (52° 02.4'N, 006° 39.4'W) were on reciprocal bearings and same time vertical sextant of Hook Head Lt Ho was 16'. Sea level was 1.5m below MHWS and I.E. was 1.6' on the arc. Find the vessel's position. From this position find the compass course to steer to arrive at a position of 3 miles due south of Mine Head Light Ho (51° 59.6'N, 007° 35.2'W). Current was setting Northerly at 2 kts and Southerly wind causing a Lee way of 3° Card No. 2, Varn:- 2^{O}E, E.spd:- 12 Kts.

Q.4 A vessel steering a course of 245^O(T) at a speed of 12 kts observes Conning Beg light vessel (Lat:-52°02.5'N, Long:- 006° 39.5'W) to bear 275^O(T) at 2000 hrs, 299^O(T) at 2020 hrs and 359^O(T) at 2050 hrs. The current in the area is estimated to set in the direction of 205^O(T). Find the vessel's position at 2050 hrs, CMG, SMG and rate of current experienced.

Q.5 While steering a course 105° (C) (varn- 2^OW, DEV-3^OW), a light house in position Lat:-$20^O00'N$, Long:- $105^O20'W$, bore $062^O(M)$ at 0800 hrs, after steaming for 0.5 hr at a speed of 12 kts, same light house bore $025^O(M)$. Find the position of the vessel at 0830 hrs. From 0830 hrs position vessel sailed on a course $200^O(T)$ distance 750 nm, find the arrival position by using Mercator principle.

Q.6 A vessel sailed on a G.C. track from a position Lat:- 45^ON, Long:- 160^OE, where would the ship cross the equator if her initial course was $270^O(T)$. What will be her course while crossing the equation.

Q.7 Find the tidal predictions for Hamburg (ATT-1, # 1444) on 28th January 1992. Also, find the height of Tide at 0700 hrs.

Q.8 a) Write short notes of the following:-   (20 marks)
i) Cumulative notices to mariners   ii) Routing charts

b) Write chart symbols of the following:-
i) Drying height   ii) no bottom found at the depth of 100 mtrs
iii) Isolated danger buoy   iv) Fishing stakes
v) Fishing stakes.

***************************X***X****************************

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours	PASS MARKS: 140	MAX. MARKS: 200

Notes:
1. Use Admiralty Tide tables for 1992.
2. **Use Chart No. 5047**, Speed 12 knots when not mentioned in question. Deviation Card No.2, HE 12m and Variation as per chart.
3. Use luminous range diagram as necessary.
4. Position of landmarks are approximate and are for identification only.

PART – A

Questions No. 1 is compulsory and attempt any 2 questions from remaining 3 questions of PART 'A'   **(30 marks each)**

Q.1 Plan a safe passage providing all the details from Port Talbot pilot station to Cardiff pilra station. Plot the courses on chart and mark accordingly for a vessel for a vessel drawing 12 mtrs draft.

Q.2 At 1700 hrs Nash Point Light ($51^O24.2'$N, $003^O33.1'$W) was 6 miles off by radar & at 1745 hrs Scarweather Light vessel Light ($51^O26.8'$N, $003^O56.2'$W) was 4 miles off by radar. During this period the vessel steered a course of 290^O(C) and experienced a current setting 170^O(T) at 4 knots and northerly wind caused leeway of 5°. Determine the vessel's position at 1700 hrs ad 1745 hrs.

Q.3 At 1100, on a vessel Steering 080^O(T), Porteymon Pt (43) ($004^O13'$W, $51^O31.5'$N) bore 030^O(T), at 1130 it bore 000^O(T) and at 1200 bore 330^O(T). Determine course and speed made good and the rate of current if the current was setting south.

Q.4 a) At 1900 Hrs ship in DR position $51^O20'$N, $004^O20'$W observing following: Star A Azimuth 218^O(T) X 2' Towards. Star B: Azimuth 143^O(T) x 1.5 Toward. Find the vessel position at 1900 hrs.

b) From 1900 Hrs position vessels intends to reach 5.5' North of Hartland point. Current was setting south at 2 Knot. Find the compass course to steer?

PART B:

ALL QUESTIONS ARE COMPULSORY: Questions 5,6,7 are for 30 marks each and Q.8 for 20 marks.

Q.5 On 21st June @ N/N Position 20° 15'S; 160° 30'E from the following log abstracts find:

- Course & distance made good noon to noon

- Position arrived at noon on 22nd June

Time	Compass Co.	Variation	Deviation	Leeway	Wind	Speed
Noon	313°C	3°E	3°E	3	N	12.5
2000 A/c	027°C	3°E	2^{O}W	3	N	12.3
0200 A/c	075°C	3°E	6°W	Nil	NE	13.1
0800 A/c	123°C	3°E	1^{O}E	3	E	14.0

Current was setting SW @ 2.5 knots throught. Engine breakdown from 0400 hrs to 0600 hrs and clocks retarded by 1 Hr at Midnight.

Q.6 A ship sails on a Great Circle track from position 24°00'N, 074°15'W to position 46°N, 053°45'W. Calculate the Initial Course & the great circle distance.

Q.7 A vessel drawing 2 mtrs fwd and 2.8 mtrs aft has to cross a sand bar sounding marked 1 mtr on the chart with a UKC of 2.5 mtrs. At Liverpool (ATT 1) on 16th March 1992. Find the earliest time on the rising tide that she can do so.

Q.8 Define the following:

a) Chart Datum   b) Routing Charts

c) Isogonic Lines   d) Drying Heights

e) ODAS Buoy

***************************X***X****************************

GOVERNMENT OF INDIA

Date: - 5th Mar-2024

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use Admiralty Tide tables for 1992.
2. Use Chart No. **5048**, Deviation Card No.2, HE 12m and Variation 5°W. Engine Speed 12 knots, if not given in the question.
3. Use luminous range diagram as necessary.
4. Position of landmarks are approximate and are for identification only.

PART – A

Questions No. 1 is compulsory and attempt any 2 questions from remaining 3 questions of PART 'A'   **(30 marks each)**

Q.1 A container vessel with maximum draft of 10 m disembarked her pilot at Youghai Bay anchorage in position 51°53.6'N, 007°51'W. Plan a safe passage from this position to join North East bound lane of St. George Channel TSS. Vessel experiencing strong southerly Gale wind. Prepare passage plan document with necessary details in the answer sheet in tabular format.

Q.2 A vessel steering 244^O(T) observes Roche's Point Lt. Ho (51°48'N, 008°15'W) light turn from red to white at 2100 hours and from white to red at 2200 hours. Find the vessel's position at 2200 hours if the current was setting 296^O(T) at 3 knots.

From 2200 hours position find the course to steer if the vessel now intends to pass Old head of Kansale light house 3 miles on her starboard, current remaining the same, the wind is now SE'ly causing 4° leeway.

Q.3 A vessel steering 022^O(T) observes following bearings of Hook head Light house:

1000 hours   007^O(T)

1040 hours   326^O(T)

1100 hours   288^O(T)

If the current was setting at 158^O(T). Find Course made good, Speed made good, rate of current and positions at 1000 hours and 1100 hours.

Q.4 a) A vessel passed 'MS Buoy' (51°41.4'N, 006°42.2'W) 3 miles to SW at 1000 hours. She is to pick up her sea pilot sharp at 1230 hours from 2 miles south of 'Hook Head' Light House (52°07.4'N, 006°55.8'W). Find the Gyro Course to Steer (error 4° Low) and engine speed to keep if the current sets West at 3 knots and Westerly winds are causing 5° of leeway.

b) Find the time and position when 'Coningberg' Light Vessel (52°02.4'N, 006°39.4'W) will be abeam.

PART B:

ALL QUESTIONS ARE COMPULSORY

Q.5 On the 13th Mar 1992 at 1200 hours, the light house in position 02°26'S, 178°37'W is 9 miles and its bearing is 200^O(T). The ship then sailed at 12 knots on the following courses:

Time	Compass	Deviation	Variation	Wind	Leeway
1200 hours	295°	2^{O}W	3°E	SW	2^O
2000 hours	326°	4°W	3°E	SW	4°
0400 hours	345°	5°W	3°E	W	4°
1200 hours	010°	3°W	3°E	W	3°

At 1900 hours the ship stopped for 1 hour and at 2400 hours clocks were retarded by 30 minutes. Calculate the estimated position at 1200 hours on the 14th Mar 1992.

Q.6 Find the initial course, final course and great circle distance from position 49°50'N, 005°15'W to position 32°29'N, 064°00'W.

Q.7 Find the earliest time to sail out of Shimonoseki (ATT Vol-III) after 0700 hours in the morning on 19th Mar 1992. Master wants a height of tide of at least 2 meter, at the time of sailing.

Q.8 Draw the following symbols as used on BA charts.   (20 marks)

a) East Cardinal mark   b) Anchoring prohibited

c) Fairway buoy   d) Rock awash at level at Chart datum

e) Wreck over which the depth has been obtained by sounding but not by wire sweep.

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GOVERNMENT OF INDIA

Date: - 5th Jan-2024

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use Admiralty Tide tables for 1992.
2. **Use Chart No. 5056**, Deviation Card No.2, HE 12m, Engine Speed 12 knots if not mentioned in the question, Variation 6°W.
3. Use luminous range diagram as necessary.
4. Position of landmarks are approximate and are for identification only.

PART – A

Questions No. 1 is compulsory and attempt any 2 questions from remaining 3 questions of PART 'A' (30 marks each)

Q.1 You are on a Car carrier, having all modern bridge equipment with a maximum sea speed of 18 knots and max draft of 10 mtrs. Your company policy mandates 10% of the draft UKC at all times. Plan a safe passage from Needles Channel Pilot station (50° 38'N, 001°39'W) to Exmouth Pilot station off Straight Point (50° 36'N, 003° 22'W).

Q.2 A vessel steering 260°(T), speed 14 knots, observes following bearings of Bill of Portland light, (50° 30.8'N, 002° 27.4'W).
At 1100 hrs 335°(T), when vessel is 8 miles from Bill of Portland light.
At 1124 hrs 000°(T)
At 1154 hrs 025°(T)
Find the set, drift & rate and vessel's position at 1154 hrs.

Q.3 At 1400 hrs vessel observes Berry head light (50° 24.5'N, 003° 28.8'W) 7 miles off by radar and at 1430 hrs observes Start pt light (50° 13.4'N, 003° 39'W) to be 6 miles off by radar. During this time interval the vessel steered a course of 178°(T), engine speed 12 knots, the current was setting 270°(T) at 3 knots and Westerly wind causing 5* deg leeway. Find the vessel's position at 1400 hrs and 1430 hrs.

Q.4 At 2000 hrs a vessel in DR position 50° 12'N, 002° 30'W, observes following star sights
Star Spica – Azimuth 130°(T), Intercept 3 miles towards
Star Deneb – Azimuth 212°(T), Intercept 2 miles away.
Find the vessel's position at 2000 hrs.
From this 2000 hrs position find the compass course to steer to reach 10 miles south of Anvil point light, current setting throughout 140°(T) at 3 knots and SE'ly wind causing 3 deg leeway.

ALL QUESTIONS ARE COMPULSORY, Questions 5, 6, 7 are for 30 mark each and Q.8 for 20 marks.

Q.5 On 21st June Noon position 20° 15'S, 160° 30'E, from the following log abstract find courses and distance made good Noon to Noon and position arrived at Noon on 22nd June.

Time	Comp. Co.	Variation	Deviation	Leeway	Wind	Log Spd (Kts)
Noon	313^O(C)	3°E	3°E	3°	N	12.5
2000 A/C	027^O(C)	3°E	2^{O}W	3°	N	12.3
0200 A/C	075^O(C)	3°E	6°W	Nil	NE	13.1
0800 A/C	123^O(C)	3°E	1^{O}E	1^O	E	14

Current was setting SW @ 2.5 knots throughout. Engine breakdown from 0400 hrs to 0600 hrs and clocks retarded by 1 hrs at midnight.

Q.6 Calculate GC distance, initial course and final course of a Great Circle track from 37°24'N 007°48'E to 31°18'N 051°42'W.

Q.7 A ship drawing drafts of F: 8.0 M, A: 9.0 M, is approaching the port of Masqat (#4186), on 25th March 1992. She has to cross a bar of depth 8.0 M with UKC 1.0 M. Find the earliest time in the afternoon when she can cross the bar?

Q.8 a) Describe the procedure for correction of BA Charts.
b) Draw the following BA chart symbols neatly in your answer sheets:
   i) Rock awash at Chart Datum
   ii) West Cardinal mark
   iii) Wreck, depth unknown, dangerous for surface navigation
   iv) Stumps of posts or piles, wholly submerged
   v) Submarine power cable

*************************X***X****************************

GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use Admiralty Tide tables for 1992.
2. Use Chart No. **5072**, Deviation Card No.3, HE 10m and Variation 4°W. Engine Speed 12 knots, if not given in the question.
3. Use luminous range diagram as necessary.
4. Position of landmarks are approximate and are for identification only.

PART – A

Questions No. 1 is compulsory and attempt any 2 questions from remaining 3 questions of PART 'A'   **(30 marks each)**

Q.1 Consider you are on a fully loaded tanker with maximum draft of 19m. (Normal Sea speed 15 knots). Plan a safe passage from Simrishamn pilot station (55° 33.5', 014° 24.0'E) to Kullagrund pilot station for deep draught tankers (55° 13.3'N, 013° 23.5'E), keeping in mind the UKC policy of your company. Good visibility & strong N'ly winds prevail. Your vessel is fitted with all the required navigational equipment and all are in good working condition.

Show clearly courses to be steered, distances and all the waypoints on the chart recording their co-ordinators in the answer booklet as well.

Q.2 A vessel near Hammerodde Lt. Ho. (55° 18'N 014° 47'E) observes the bearing of the Lt. Ho. as 137^O(T) range 4.2 NM. Find the position of the vessel. Thereafter, with the current setting 345^O(T) at 2 knots, the vessel steered a course of 258^O(T). Find the course and speed made good and also the distance off from Sandharmmeren Lt. Ho. (55°23'N 014°12'E) when it is abeam to stbd.

Q.3 Vessel anchored off YSTAD observes the following:

ABBEKAS LIGHT	(55°23'N 013°37'E)	- 298^O(C)
YSTAD SOUTH	(55°25'N 013°49'E)	- 009^O(C)
KASEBARGA LIGHT	(55°23'N 014°04'E)	- 078^O(C)

Find the compass error and position of the vessel. From this position find a compass course to steer to pass Hammerodde lighthouse 2 miles off counteracting a current of 060° x 2 knots and a strong northerly wind causing 5° leeway.

Q.4 While steering a course of 228^O(T) Olands Sodra Grund Racon light (56° 04'N 016° 42'E) was last sighted at 2100 hours, when visibility was 5 nm. At 2200 hrs, Utklippan Lt. (55° 57'N 015° 41'E) was first sighted, visibility remaining the same. Current was known to be setting 013^O(T) at 2.5 knots throughout. Find the vessel's position at 2100 hrs and also the time and position when Utklippan light will be last sighted.

Q.5 On 6th March noon, a ship in position 46°36'S 175°34'E steamed the following courses:

Time	Co (C)	Dev	Leeway	Wind	Speed in Knots
1200	150°	5°E	3°	SW x W	8
1600	140°	4°E	5°	SW	8
2000	120°	3°E	NIL	SW	7.5
2400	120°	3°E	NIL	SW	6.5
0400	100°	1^{O}E	NIL	S	8
0800	095°	NIL	NIL	S	8
1200	095°	NIL	NIL	S	8

Variation 10°E throughout. Find the DR position at noon on 7th March. If the observed position, then was 48°14.3'S, 178°06.5'E, find the set and drift of current.

Q.6 a) If a ship departs from position 46°14'N, 125°36'W on a course of 237^O(T) and covers 706', find the position reached.

b) A ship in position 41°10'S 032°45'W is steering a course of 090^O(T) at a speed of 16 knots. Find the longitude reached after 22 hours of steaming.

Q.7 A vessel having a maximum draft of 7m wants to clear a bar (charted depth 6m), at Bombay (#4359) on 15th February 1992 with a UKC of 2m. Find the earliest time in the evening, when the vessel can do so.

Q.8 a) Differentiate between Preliminary, Temporary & Permanent Notices.
b) Write notes on the following:
i) Chart Datum   ii) Natural scale
iii) Meridional part   iv) Plate dimension.   (20 marks)

***************************x***x*****************************

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use Admiralty Tide tables for 1992.
2. **Use Chart No. 5048**, Deviation Card No.2, HE 12m, Engine Speed 12 knots if not mentioned in the question, Variation 6°W.
3. Use luminous range diagram as necessary.
4. Position of landmarks are approximate and are for identification only.

PART – A

Questions No. 1 is compulsory and attempt any 2 questions from remaining 3 questions of PART 'A'   (30 marks each)

Q.1 Plan a safe passage from Cork Harbour pilot stn (51° 45'N 008° 15'W) to a position 52° 08'N 006° 45'W. Your ship is VLCC with draft of 19.5m and fitted with latest bridge equipment. Apply your company UKC policy for the intended passage. Courses to be plotted on the chart, with clear marking of course, distance and alteration points for each leg of passage. Passage plan to be written in Tabular format in your answer sheet.

Q.2 Following bearings of Mine Head Lt Ho (52° 00'N 007° 35'W) were observed:
1900 hrs: 271°(T), 1925 hrs: 314°(T) and 2005 hrs: 005°(T).
At 2005 hrs Ram Head Pt. (51° 55'N 007° 43'W) was bearing 335°(T).
During above period ship steered a course of 222°(T) at speed of 9 kts.
Find course made good, set & drift and position at 2005 hrs.

Q.3 While steering a course of 062°(T) x 14 kts, at 2100 hrs Bally cotton Lt Ho. (51° 50'N 007° 59'W) was first sighted and at 2140 hrs it was last sighted. During this period current was estimated to set 290°(T) x 4 kts. Visibility 3 NM. Find CMG, SMG and positions at 2100 and 2140 hrs.

Q.4 On a vessel at 0500 hrs Pilot Lookout Lt Ho. (52° 09'N 007° 00'W) and Hook Head Lt Ho (52° 07'N 006° 56'W) were in transit bearing 302°(G) and after 45 minutes Hook Head Lt Ho was bearing 048°(G). During this period vessel sailed on course of 265°(G) at speed of 11 kts, current was estimated to set 210°(T) x 4 kts.
Find position at 0500 hrs, course made good and speed made good.

ALL QUESTIONS ARE COMPULSORY, Questions 5, 6, 7 are for 30 mark each and Q.8 for 20 marks.

Q.5 From following log abstracts find the course and distance made good noon to noon and EP on 14th Noon if observed position on 13th Noon is 40° 25'N 070° 38'E.

Time	Remark	Com Co	Dev	Var	Wind	Leeway	Log
13th 1200	Set Co	220	2W	3E	Sly	2	00
2000 Hrs	A/C	160	1E	3E	Sly	3	100
14th 0800 Hrs	A/C	122	2E	4E	Ely	Nil	210
1200 Hrs	A/C	130	3E	4E	Ely	2	260

A SWly current @ 2kts was experienced throughout. Clocks were advanced 1 hr at midnight. Ship had engine breakdown from 0200 hrs to 0300 hrs on 14th.

Q.6 Find GC distance, initial course and position of Vertex between Cape Bird 77° 08'S 166° 30'E and San Francisco 37° 49'N 122° 25'W.

Q.7 Find daily tidal predictions on 19th Feb 1992 at Port Duclair (ATT Vol 1. #1588).

Q.8 i. Draw chart symbols of the following:
   a) Wreck which cleared by wire sweep to depth is 15.3 meters.
   b) Production platform showing flare.
   c) Suspended well over which depth is 19.6 meters.
   d) Rock which dries at level of chart datum.
   e) SW'ly 3 kts Flood tide.
ii) Write section-wise brief contents of weekly notices to mariners.

***************************X***X*****************************

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use Admiralty Tide tables for 1992.
2. Use Chart No. **5047**, Deviation Card No.2, HE 12m, Engine Speed 12 knots if not mentioned in the question, Variation 6°W.
3. Use luminous range diagram as necessary.
4. Position of landmarks are approximate and are for identification only.

PART – A

Questions No. 1 is compulsory and attempt any 2 questions from remaining 3 questions of PART 'A'   **(30 marks each)**

Q.1 Your vessel has a maximum draft of 7.2m and is bound from position 50° 00'N 040° 45'W to Port Talbot pilot station. Vessel is fitted with all modern navigation aids. Plan a safe passage with clear marking of courses and distances, alteration points for each leg of passage.

Q.2 A vessel steering a certain course, observes following bearing at 1900 hrs:
  a.   St. Gowan Head Pt (37)   :   259^O(C)
  b.   Caldey Island Lt Ho.   :   079^O(C)

Same time the vessel observes St Gown Lt Vessel 30° on her Starboard bow. At 1930 hrs, she observes the same Lt. Vesel 60° on her Stbd bow. Find position of the vessel and course steered by the vessel. Ship's speed 12 kts.

Q.3 At 0800 hrs a vessel observes vertical Sextant Angle of Lundy Island North Lt. Ho. (51° 12'N, 004° 40.6'W) charted height 50m, to be 0° 20.5', I.E. 2.0' on the arc, when it was due East. Find course to steer from this position to have St. Gowan Lt Vessel (51° 30.5'N, 004° 49.5'W) right ahead when it is 4.0 miles off, if the current was assumed to be setting 250^O(T) at 3.5 kts. At 0920 hrs St Gowan Lt Vesel was observed to bear 326^O(T) x 4.0'. Find the correct set and rate of current.

Q.4 A ship is steering a course 030^O(T) at 12 Kts observes Lundy Island South Light to bear 352^O(T) at 1600 hrs, same light bore 284^O(T) at 1620 hrs. At 1700 hrs Bull point Lt Ho bore 125^O(T). The current was known to be setting 070^O(T). Find ship's position at 1700 hrs and rate of current.

PART B:
ALL QUESTIONS ARE COMPULSORY

Q.5 Following courses and distances were steamed by a vessel doing 12 knots, between noon of 15th March till noon of 16th March. The noon position on 15th March was observed to be 12°N 30°E.

Ship's Time	Compass Course (deg)	Variation (deg) E/W	Deviation (deg) E/W
1200 – 1800	070°	3°E	2°E
1800 – 2400	110°	2°E	2°W
0000 – 0600	080°	3°E	4°E
0600 – 1200	100°	2°E	4°W

Calculate the expected noon position for 16th March.

Q.6 Calculate the Great Circle Distance, Initial & final course between 10°N 30°E and 30°N 100°E.

Q.7 Calculate the height of tide at Richmond (ATT Vol.2 #2821) on 29th March 1992.

Q.8 Draw the following symbols as used on BA charts.   (20 marks)
a) Fishing Strakes
b) Light vessel as per IALA system.
c) Pilot boarding position
d) ODAS (Ocean Data Acquisition Buoy)
e) EEZ (Exclusive Economic Zone)

**************************x***x****************************

GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:

1. Use Admiralty Tide tables for 1992.
2. **Use Chart No. 5072** (Falseturbo to Oland), Deviation Card No.2, HE 18m, Engine Speed 12 knots if not mentioned in the question, Variation 5°E.
3. Use luminous range diagram as necessary.
4. Position of landmarks are approximate and are for identification only.

PART – A

Questions No. 1 is compulsory and attempt any 2 questions from remaining 3 questions of PART 'A'   (30 marks each)

Q.1 A vessel with maximum draft of 9.0 m sailed out from YSTAD harbor and disembarked her pilot at pilot station (55° 23.6N, 013° 49.4E). She is bound for Karishamn Plt stn (56° 08'N, 014° 53'E). Vessel is fitted with all modern navigation aids. Plan a safe passage with clear marking of courses and distances, alteration points for each leg of passage from pilot station to pilot station. Write a brief summary of passage plan in the answer sheet.

Q.2 A 1800 hrs a vessel observes bearing of Sandhammaren Lt (55° 23'N, 014° 11.8'E), was 030°T, range 9 miles. At 1830 hrs same light bearing was 005°T and again at 1912 hrs it was 345° T). During above interval the vessel steered 118°T at 10 knots. Find course made good, position at 1912 and set and rate of current encountered by the vessel.

Q.3 At 2010 hrs a vessel in DR position 55° 45'N, 014° 50'E, observed following star sights.

Star 'A': Azimuth 210°T, intercept 1.5 miles towards.

Star 'B': Azimuth 080°T, intercept 2.0 miles away.

Find the position of vessel at 2010 hrs.

b) From 2010 hrs position, find out compass course to steer to reach pilot station off Svaneke Light (55° 08.5'N, 015° 11.5'E) if current was setting south at 2 knots. Leeway 3°, Wind N'ly. Ship's speed is 15 knots. Also find her ETA to pilot stn.

Q.4. A vessel observed following compass bearings:

- Christatiano (S) Lt. (55° 19'N, 015° 11'E)   – 010°C
- Swaneke Lt (55° 08'N, 015° 09' E)   – 190°C
- Hammerodde Lt (55° 18'N, 014° 46.7'E)   – 283°C

Find vessel's position and compass error, and deviation. Use variation from Chart.

PART B:
ALL QUESTIONS ARE COMPULSORY

Q.5 From the following log abstracts find the course and distance made good noon to noon and EP on 14th Noon, if position of ship on 15th noon was 01° 30'N 179° 50'E.

	Comp Co	Dev	Var	Wind	Leeway	Log
15th N/N Set Co.	220°	2^{O}W	3°E	Sly	2^O	00
2000 hrs A/C	160°	1^{O}E	3°E	Sly	3°	100
16th 0200 Hrs A/C	070°	2^{O}W	4°E	Ely	2^O	160
0800 hrs A/Co	122°	2^{O}E	4°E	Ely	Nil	210
1200 hrs A/Co	130°	3°E	4°E	Ely	2^O	260

A NNW'ly current @ 2 kts was experienced throughout. Clocks were advanced 1 hr at midnight. Ship had engine break down from 0410 hrs to 0520 hrs.

Q.6 Find initial course, great circle distance and position of vertex from Cape Finisterre 42° 50'N, 009° 30'W to Fortaleza, Brazil 03° 45' S, 038° 10'W.

Q.7 Find daily tidal predictions at Quseir (ATT Vol II, #4098) on 22nd Jan 1992.   (30 marks)

Q.8 i) Define the following: a) Chart Datum   b) Routeing Charts   c) Isogonic line
d) Drying Heights   e) ODAS Buoy
ii) Give chart symbols for the following:
   a) Wreck dangerous to surface to navigation
   b) Temple
   c) Eddies
   d) Break water
   e) Radar conspicuous object.   (20 marks)

***************************x***x***************************

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

| TIME: 3 Hours | PASS MARKS: 140 | MAX. MARKS: 200 |

Notes:
1. Use Admiralty Tide tables for 1992.
2. **Use Chart No. 5047**, Deviation Card No.2, HE 12m, Engine Speed 12 knots if not mentioned in the question, Variation 6°W.
3. Use luminous range diagram as necessary.
4. Position of landmarks are approximate and are for identification only.

PART – A

Questions No. 1 is compulsory and attempt any 2 questions from remaining 3 questions of PART 'A'   (30 marks each)

Q.1 A vessel having a draft of 12 m drops pilot at Bristol Pilot Grounds (51° 21'N, 003° 19'W) in gale force winds and is bound for Swansea (51° 32'N, 003° 57'W) while the vessel is equipped with ARPA, Echo sounder, Doppler log. In view of the above, plan a safe passage, apply your company UKC policy, for the intended passage. Courses to be plotted on the chart, with clear marking of course, distance and alteration points for each leg of passage. Passage plan to be written inn Tabular format in your answer sheet.

Q.2 A vessel steering 283^O(T), engine speed unknown, observes at 1000 hrs North Lundy lt ho (51° 12'N, 004° 40'W) bore 250^O(T) and at 1030 hrs it bore 160^O(T), the same light then bore 118^O(T) at 1050 hrs. If the current was setting 222^O(T) at 3 knots, find CMG, Engine speed and vessel's position at 1030 hrs and 1050 hrs.

Q.3 A vessel in D.R. position 51° 36'N, 004° 25'W observed the following bearings:

Worm Head Point (51° 34'N, 004° 20' W)	100° (G)
Helwick Lt vessel (51° 31'N, 004° 25' W)	207° (G)
DZ4 FLY 5 sec (51° 36'N, 004° 30'W)	297° (G)

Find the Gyro error and the vessel's position.

Q.4 A Vessel steering a course of 035° (T) observes Lundy Island South Lt (51° 09'N, 004° 39'W) for the first time at 2300 hrs, the visibility at this time was 5 miles. The same light obscured at 2336 hrs. If the current was setting 340^O(T) at 2 knots.

Find: a) The position at 2336 hrs and 2300 hrs

b) Find the Course and Speed made good.

ALL QUESTIONS ARE COMPULSORY: Questions 5, 6, 7 are for 30 marks each and Q.8 for 20 marks.

Q.5 On the 13th Mar 1992 at 1200 hrs, the light house in position 02° 26'S, 178° 37'W is 9 miles and its bearing is 200° (T). The ship then sailed at 12 knots on the following courses:

Time	Compass	Deviation	Variation	Wind	Leeway
1200 hrs	295°	2^OW	3^OE	SW	2^O
2000 hrs	326°	4^OW	3^OE	SW	4°
0400 hrs	345°	5^OW	3^OE	W	4°
1200 hrs	010°	3^OW	3^OE	W	3°

At 1900 hrs the ship stopped for 1 hour and at 2400 hrs clocks were retarded by 30 minutes. Calculate the estimated position at 1200 hrs on the 14th Mar 1992.

Q.6 Calculate distance, initial course and position of vertex of a Great Circle track from 42° 36'S 140° 24'W to 26° 24'S 150° 54'E.

Q.7 A ship of maximum draft 9.0m, is approaching the port of Muscat (#4186), on 25th March 1992. She has to cross a bar of depth 8.0 m with UKC 1.0 m. Find the earliest time in the afternoon when she can cross the bar?

Q.8 a) Write section wise brief contents of BA Weekly notice to mariners.   (10 marks)
b) Draw the following BA chart symbols neatly in your answer sheets.   (10 marks)

    i) Depth at chart datum to which area have been swept by wire drag.

    ii) Wreck, depth unknown, dangerous for surface navigation

    iii) Anchoring prohibited

    iv) Isolated danger mark

*************************X***X*****************************

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours	PASS MARKS: 140	MAX. MARKS: 200

Notes:
1. Use Admiralty Tide tables for 1992.
2. Use Chart No. **5048**, H.E. – 12 m, Deviation Card No.2.
3. Use luminous range diagram as necessary.
4. Position of landmarks are approximate and are for identification only.

PART – A

Questions No. 1 is compulsory and attempt any 2 questions from remaining 3 questions of PART 'A' (30 marks each)

Q.1 A container vessel with maximum draft 15.0m drops pilot at Cork harbour pilot station (51° 45.0'N, 008° 15'W) and is bound for Liverpool through St. George's channel TSS. Vessel is equipped with Radar, ARPA, GPs and echo sounder. Plan a safe passage from pilot station to join the NE bound lane of St George's channel TSS. Plot the courses and distances on the chart with clear marking of course alteration point. Write in brief the synopsis of passage planning in the planning in the answer sheet.

Q.2 From position 5 n.m. South of Old Head of Kinsale Lt. Ho. (51° 36.4'N, 08° 32'W) at 2000 hrs a vessel sailed on a certain course to first sight Bally cotton Island (51° 49.4'N, 07° 59'W) Lt right ahead with current setting SE'ly at 2 Kts in Meteorological Visibility 5 n.m. Find the course that the vessel was steering from 2000 hrs and time when the Bally cotton light will be observed right ahead. Ship's speed 9Kts, HE = 12 mtrs.

Q.3 At 1000 hrs an observer observed the following: - Hook head Lt (52° 07.3'N, 006° 55.8'W) and Conning Beg Lt Vsl (52° 02.4'N, 006° 39.4'W) were on reciprocal bearings, and same time vertical sextant angle of Hook Head Lt Ho was 16'. Sea level was 1.5 m below MHWS and I.E. was 1.6' on the arc. Find the Vessel's position. From this position find the compass course to steer to arrive at a position of 3 miles due south of Mine Head Light Ho (51° 59.6'N, 007° 35.2'W). Current was setting Northerly at 2 Kts and Southerly wind causing a leeway of 3°. Card No.-2, Varn:- 2^{O}E, E.spd:- 12 kts.

Q.4 A Vessel steering a course of 245^O(T) at a speed of 12 kts observes Conning Beg light vessel (Lat: - 52° 02.5'N, Long:- 006° 39.5'W) to bear 275^O(T) at 2000 hrs, 299^O(T) at 2020 hrs and 359^O(T) at 2050 hrs. The current in the area is estimated to set in the direction of 205^O(T). Find the vessel's position at 2050 hrs, CMG, SMG and rate of current experienced.

PART B:

ALL QUESTIONS ARE COMPULSORY: Questions 5, 6, 7 are for 30 marks each and Q.8 for 20 marks.

Q.5 A vessel sailed on a G.C. track from a position Lat: - 45° N, Long: - 160^OE, where would the ship cross the equator if her initial course was 270^O(T). What will be her course while crossing the equator.

Q.6 While steering a course 105^O(C) (varn-2^OW, dev-3^OW), a light house in position lat:- 20° 00'N, long:- 105° 20'W, bore 062^O(M) at 0800 hrs, after steaming for 0.5 hr at a speed of 12 kts, same light house bore 025^O(M). Find the position of the vessel at 0830 hrs. From 0830 hrs position vessel sailed on a course 200^O(T), distance 750 nm, find the arrival position by using Mercator principle.

Q.7 Find the tidal predictions for Hamburg (ATT-1, #1444) on 28th January 1992. Also find the Height of Tide at 0700 hrs.

Q.8 a) Write short notes of the following: -
i) Cumulative notices to mariners   ii) Routing charts

b) Write chart symbols of the following:-
i) Drying height   ii) no bottom found at the depth of 100 mtrs
iii) Isolated danger buoy   iv) Fishing stakes   v) Fairway Buoy.

************************x***x****************************

GOVERNMENT OF INDIA

Paper 1 **Date: - 3rd May-2023**

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours **PASS MARKS: 140** **MAX. MARKS: 200**

Notes:
1. Use Chart No. **5056** (Start point to the needles), Deviation Card No. 1, HE 10 m, Engine Speed 12 knots if not mentioned in the question: Variation 6°W.
2. **Positions of landmarks are approximate and are to be used for identification only.**
3. Use luminous range diagram as necessary.
4. Use Admiralty Tide Tables for 1992.
5. PART A – Question No. 1 in Compulsory, attempt any two questions from remaining. All questions carry 30 marks.
6. PART B – Question Number 5,6,7 carries each 30 marks and question number 8 carries 20 marks.

PART – A

Q.1 A Bulk carrier with a maximum draft of 11m drops pilot at Needles Channel pilot station (50° 37.8'N 001° 39') and is bound for Portland Harbour (50° 36' N 002° 25'W). Vessel is equipped with all the required Navigational equipment including ECDIS. Plan a safe passage for the intended route considering the UKC policy of your company. Courses need to be plotted on the chart. Course and distance for each leg of passage and course alternation points to be clearly shown on the charts.

Q.2 A vessel observer following bearing of Bill of Portland light (50° 30.8'N 002° 27.4'W):
1200 hours – 330°T, 1230 hours – 000°T, 1300 hours – 030°T.
Course steered by vessel during 1200 hours to 1300 hours was 260°T, speed 12 knots. Current was setting 350°T, rate unknown. Find out vessel's speed, position at 1200 hours, 1300 hours and rate of current?

Q.3 At 1000 hours Horizontal Sextant angle between Hope's nose (50° 27.8'N, 003° 29'W) and Berry head (50° 24'N, 003° 29'W) was 20° and again at 1100 hours same vessel observers radar distance at start point (50° 13.5'N, 003° 38.8'W) was 8 miles. Between 1000 hours to 1100 hours course steered by vessel was 210°T, speed 10 knots. Current was setting 270°T at rate of 2 knot. Find vessel's position at 1000 hours and 1100 hours?

Q.4 At 2000 hrs a vessel last sighted Anvil point light (50° 35.5'N, 001° 50.6'W) & at 2100 hours same vessel first seen Bill of Portland light (50° 30.8'N, 002° 27.4'W). During 2000 hrs to 2100 hrs course steered by vessel was 240°T and speed 10 kts. Find out vessel's position at 2000 hr and 2100 hours. (Met visibility was 2 miles throughout the period).

PART B:

ALL QUESTIONS ARE COMPULSORY: Questions 5, 6, 7 are for 30 marks each and Q.8 for 20 marks.

Q.5 On 1st February noon time a vessel was 5 mile south east of position lat 35° 40'N long 080° 30'E, steamed following courses:

1200 hr course was 045°T and 1800 hour next alternation was 120°T, Engine breakdown took place between 2000 hour to 2100 hour and clocks were retarded by 01 hour at mid-night. Next alteration was made at 0300 hour as 170°T and vessel steered same course till 2nd Feb noon time. Throughout sailing vessel's engine speed was 12 knot and current was setting west at rate of 3 knot. Find out EP on 2nd February noon time, CMG and DMG.

Q.6 Find initial CO, Final CO and posn of vertex between position 30°N, 060°E to 50°S, 155°E.

Q.7 Find the height of tide at port of Seattle date 08.03.1992 (ATT No.9174) at 0900 hr LMT.

Q.8 a) In admiralty weekly notice to mariners chart no. BA 5056 has following permanent Corrections, ADM WNM No. 3 of 2011 correction no. 105:

Obstruction of surface navigation in position 50° 31.8'N 003° 26'W.

Carry out chart correction for the same and make necessary entry in chart. Assume BA 5056 is corrected and up to date for all notices previous to ADM WNM No. 03 of 2011 (Correct the chart by pencil).

b) Write notes on following – Chart Datum, Natural scale, Meridional part, plate dimension.

***************************X***X***************************

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:

1. Use Chart No. 5047, Use Dev Card No. 2, Var 6° W, HE 12 M, Eng Spd 12 Knots when not mentioned in question.

PART – A:

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING THREE:

(30 MARKS EACH)

Q.1 Plan a safe passage for a chemical tanker with max draft of 10 m, as per your company UKC policy, from Port Talbot Pilot station to Cardiff pilot station in restricted visibility and current setting northerly at 3 knots. Plot safe courses on chart and prepare passage plan document with necessary details in the answer sheet in tabular format.

Q.2 A vessel steering 283^O(T), engine speed unknown, observes at 1000 hrs North Lundy Island Lt. Ho. (51° 12'N, 004° 40'W) bearing 250^O(T) and at 1030 hrs it bore 160^O(T), the same light their bore 118^O(T) at 1050 hrs. If the current was setting 222° (T) at 3 knots, find the CMG, Engine speed and vessel position at 1030 hrs and 1050 hrs.

Q.3 A vessel in D. R. posn 51° 36'N, 004° 25'W observed the following bearings:

Worm Head Point (51° 34'N, 004° 20'W)   100^O(G)

Helwick Lt Vessel (51°31'N, 004° 25'W)   207^O(G)

DZ4 FLY 5sec (51° 36'N, 004° 30'W)   297^O(G)

Find the Gyro error and the vessel's position.

Q.4 a) At 1900 hours ship in DR position 51°20'N, 004°20'W observed Star 'A' Azimuth 218^O(T) x 2' Towards: Star 'B': Azimuth 143^O(T) x 1.5 Towards. Find position at 1900 hrs.

b) From 1900 hours position vessel intends to reach 5.5 miles North of Hartland point. If current is setting South at 2 knots, find the compass course to steer and also the time and position when Hartland point will be abeam.

PART B:

ALL QUESTIONS ARE COMPULSORY: Questions 5, 6, 7 are for 30 marks each and Q.8 for 20 marks.

Q.5 On 21st June Noon position 20° 15'S, 160° 30'E, from the following log abstract find courses and distance made good Noon to Noon and position arrived at Noon on 22nd June.

Time	Compass Course	Variation	Deviation	Leeway	Wind	Log Speed (Kts)
Noon	313^O(C)	3°E	3°E	3°	N	12.5
2000 A/C	027^O(C)	3°E	2^{O}W	3°	N	12.3
0200 A/C	075^O(C)	3°E	6°W	Nil	NE	13.1
0800 A/C	123^O(C)	3°E	1^{O}E	3°	E	14

Current was setting SW at 2.5 knots throughout. Engine breakdown from 0400 hrs to 0600 hrs and clocks retarded by 1 hrs at midnight.

Q.6 Calculate GC distance, initial course and final course of a Great Circle track from 37°24'N 007°48'E to 31°18'N 051°42'W.

Q.7 A ship of maximum draft 9.0 M, is approaching the port of Muscat (#4186), on 25th March 1992. She has to cross a bar of depth 8.0 M with UKC 1.0 M. Find the earliest time in the afternoon when she can cross the bar?

Q.8 Draw the following BA chart symbols nearly in your answer sheets:
    a) West cardinal mark
    b) Wreck where exact depth is unknown but which is considered to have safe clearance at the depth 30 m
    c) Wreck, showing any part of hull or superstructure at the level of chart datum.
    d) Isolated danger mark
    e) Rock whose drying height is 1.0 meters

***********************X***X***************************

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours	PASS MARKS: 140	MAX. MARKS: 200

<u>Notes</u>:
1. Use Chart No. 5056 (Start Point to The Needles), Use Deviation Card No. 4.
2. Luminous range diagram may be provided if necessary.
3. Use Admiralty Tide Table for 1992.
4. Engine Speed is stipulated in each question.
5. Position of landmarks are approximate and are to be used for identification only.

PART – A:

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING THREE:

(30 MARKS EACH)

Q.1 A new Oil Tanker, maximum draft 12 meters, a maximum speed of 16 knots was located in position 49° 55'N, 002° 40'W at 0300 hours. She is required to reach Poole Bay to await lighterage (50° 40'N, 001° 51'W). Visibility is poor, 20 knots winds from south are prevailing. The vessel is fitted with all modern equipment all in good working order.

Plan a safe passage to the destination, giving the fullest details on the chart & in the answer booklet. What ETA would you convey?

Q.2 A vessel was in position 51° 36'N, 007° 31.5W at 1830 hours. Find the course to steer to have Coningbeg Lt. V/L (52° 02.3'N, 006° 39.4'W) 4 points on her port bow when 10 miles away. Engine speed is 12 knots. Calculate the time & position when will the light vessel be abeam.

Q.3 At 2300 hours, steering 300°(T) at 14 knots, FR light at the 'Start Pt.' Lt. Ho. (50° 13.3'N, 003° 38.4'W) becomes visible.

Earlier at 2100 hours, 'E channel Racon' (49° 59.0'N, 002° 29.0'W) & 'Channel Lt. V/L' (49° 54.5'N, 002° 55.4'W) were observed to be same distance away on her radar.

If current is known to set 250°(T) at 3 knots, find CMG, SMG & her 2100 hours and 2300 hours positions.

Q.4 A vessel at anchor, on a steady heading, observes the following owing bearings were observed by a ship:

Hope's Nose (50° 27.8'N, 003° 28.8'W)	230°(C)
The Ness (50° 32.2'N, 003° 29.8'W)	271°(C)
Straight Pt. (50° 36.4'N, 003° 21.7'W)	333°(C)

Find the position of the vessel, the compass error.

PART B:

ALL QUESTIONS ARE COMPULSORY: Questions 5, 6, 7 are for 30 marks each and Q.8 for 20 marks.

Q.5 At noon on Feb 21, a light house in position 58° 54.8'S, 108° 52.0'E, bore 297° (T) distance 17'. The vessel then steered by Gyro Compass (Gyro Error 1^O (high)), the following courses:

Date & Time	Course^{O}G	Engine Speed
Feb. 21 1200 hours	136^OG	16.0 knots
Feb. 21 1700 hours	047^OG	15.0 knots
Feb. 22 0200 hours	198^OG	15.6 knots
Feb. 22 1030 hours	099^OG	14.8 knots

Engines remained stopped from 2200 to 0100 hours. Clocks were advanced by 30 minutes at midnight. Current setting 300^O(T) @ 2.3knots was experienced throughout.
Estimate the position on 22nd Noon, CMG and DMG.

Q.6 Find the position of the Vertex for a vessel that sailed on a Great Circle course from position 20° 08'S, 021° 38'E to position 33° 45'S, 110° 36'E.

Q.7 Find the height of tide at 2220 hours on 19th March 1992 at the port of Ogashi (# 7659).

Q.8 Draw the following chart symbols and write your reaction in case the ship's track was laid over them:

    a) ODAS Buoy
    b) Production Platform
    c) Wire Swept Wreck to a depth of 14 meters.
    d) Radar Transponder Beacon transmitting Morse Code "J".
    e) Stranded wreck.

*************************X***X*****************************

GOVERNMENT OF INDIA

Paper 1   **Date: - 3ʳᵈ Mar-2023**

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use Chart No. 5047, MMD Deviation Card No. 2. HE 12M, Eng Spd. 12 knots if not mentioned in question, Var 6 W, Use ATT 1992.

PART – A:

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING THREE:

(30 MARKS EACH)

Q.1 A vessel having a draft of 12 M drops pilot at Bristol Pilot Grounds (51° 21'N, 003° 19'W) in gale force winds and is bound for Swansea (51° 32'N, 003° 57'W) while the vessel is equipped with ARPA. Echo Sounder, Doppler log. In view of the above plan a safe passage, your company UKC policy of 1 Meter to be maintained at all times.

Q.2 A vessel steering 283^O(T), engine speed unknown, observes at 1000 hrs North Lundy lt ho (51° 12'N, 004° 40'W) bore 250^O(T) and at 1030 hrs it bore 160^O(T) the same light then bore 118^O(T) at 1050 hrs. If the current was setting 222^O(T) at 3 knots, find CMG, Engine speed and vessel's position at 1030 hrs and 1050 hrs.

Q.3 A vessel at anchor observed following bearings:

Worm Head pt (51° 34'N, 004° 20'W) --- 100^O(G)

Helwick Lt vessel (51° 31, 004° 25'W) --- 207^O(G)

DZ4 Fl Y 5 sec (51° 36'N, 004O 30'W) --- 297^O(G)

Find Gyro error and the vessel's position.

Q.4 A vessel while steering a course of 035^O(T) observes Lundy Island South Lt (51° 09'N, 004° 39'W) for the first time at 2300 hrs, the visibility at this time was 5 miles. The same light obscured at 2336 hrs. If the current was setting 340^O(T) at 2 knots. Find a) the position at 2336 hrs and 2300 hrs. b) Find the Course and Speed made good.

PART B:

ALL QUESTIONS ARE COMPULSORY: Questions 5, 6, 7 are for 30 marks each and Q.8 for 20 marks.

Q.5 Vessel steered following courses from 29 Oct noon to 30 Oct noon:

Duration	True Course	Distance NM
1200 – 1600 hrs	122°	52
1600 – 2200 hrs	090°	84
2200 – 0400 hrs	075°	72
0400 – 1200 hrs	105°	96

At 1730 hrs a south cardinal buoy in posn 35° 40S 135° 15W was observed 2 points on Port bow and at 1800 hrs it was abeam find course and distance made good and also the DR position on 30 Oct noon.

Q.6 Calculate GC distance, initial course and position of vertex of a Great Circle track from $42^O36'$S $140^O24'$W to $26^O24'$S $150^O54'$E.

Q.7 Find the height of tide at the port of Wailingding Dao (#7086) on 10th February 1992 at 2200 hours.

Q.8 a) What are the contents of BA Weekly notices to mariners.
b) Draw the following BA chart symbols:
      i) Depth at chart datum to which area have been swept by wire drag.
      ii) North Cardinal mark.
      iii) Wreck, depth unknown, dangerous for surface navigation
      iv) Anchoring prohibited
      v) Isolated danger mark

****************************x***x****************************

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use Chart No. 5047 (Bristol Channel), Deviation Card No. 3.
2. Positions of the landmarks are approximate and are for identification purpose only.
3. Use Luminous range diagram may be provided if necessary.
4. Use Admiralty Tide Tables for 1992.
5. Engine speed is stipulated in each question.

PART – A:

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING THREE:

(30 MARKS EACH)

Q.1 Your ship is located in position 51° 34'N, 004° 59'W. She is required to reach a position 51° 31'N, 003° 53'W. Draft: 13 meters, a maximum speed of 10 knots. She has only one working radar, the other bridge equipment is in good working order. Strong SW'ly gales & moderate visibility prevails. Prepare a safe passage plan to the given location, giving details on the chart & in the answer booklet.

Q.2 2 FG Vert. Lts. at 'Ilfracombe' Pilots (51° 12.6'N, 004° 06.7'W) were observed to bear 190^O(T) at 2120 hours, 160° (T) at 2138 hours and again 125^O(T) at 2207 hours. If the ship had been steering 250^O(T) at 13 knots & the tide is setting North, find its rate. Also find CMG, SMG & the ship's positions at all three observations.

Q.3 On 15th August 2010 a ship observed the following bearings: -
i) Helwick Lt. v/l. (51° 30.3'N, 004° 25.5'W) – 083^O(C)
ii) Caldev Is. Lt.Ho. (51° 37.9' N, 004° 41.0'W) – 004^O(C)
iii) St. Govan Lt. V/l. (51° 30.6' N, 004° 59.7'W) – 232° (C)
Find the deviation of the compass on this heading.

Q.4 At 2100 hours, Helwick Lt. v/l. (51° 30.6'N, 004° 25.5'W) was forward of the beam at 5 miles by the radar while the ship steered 100^O(T). At 2130 hours Scarweather Lt. V/l. (51^O26.8'N, 003° 56.0'W) bore 080^O(T). The current was setting 130^O(T) at 4 knots and engine speed was maintained at 16 knots. Find the ship's position at both times.

PART B:

ALL QUESTIONS ARE COMPULSORY: Questions 5, 6, 7 are for 30 marks each and Q.8 for 20 marks.

Q.5 At noon on 04th January, a light house in position 28° 48.5'N, 178° 25.0'W, bore 063^O(T) distance 11.0'. Following courses were then steered by Gyro Compass (Gyro Error 3° (high) by the ship).

Date & Time	Course ^{O} G	Engine Speed
Jan, 04 1200 hours	333°G	16.2 knots
Jan, 04 1400 hours	310°G	14.8 knots
Jan, 04 2400 hours	264°G	15.0 knots
Jan, 05 1030 hours	206°G	14.6 knots

Engines remained stopped from 1800 to 2100 hours. Clocks were retarded by 30 minutes at 0100 hours. Current setting SE'ly at 2 knots was experienced throughout.
Estimate the position on 05th noon, CMG and DMG.

Q.6 A vessel sails on an Initial Great Circle course of 278^O(T) from 36° 11'N, 177° 17'W. Her course was 270^O(T) when she had sailed for 1/3rd of the total voyage distance. Find the position of her destination port.

Q.7 A feeder vessel lightly runs aground over a 2m patch on the chart for BHARUCH on 10th March 1992 at 2021 hours UTC. Estimate her draft.

Q.8 Draw CLEARLY the following chart symbols in the answer booklet.
a) Sounding of Doubtful Depth
b) Overfalls
c) Radio Mast
d) Rock Awash at the level of the chart datum.
e) Spoil Ground

*************************X***X***************************

GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours	**PASS MARKS: 140**	**MAX. MARKS: 200**

Notes:
1. Use Chart No. 5056 (Start point to the needles), Deviation Card No. 2, HE 12m, Engine Speed 12 knots if not mentioned in the question. Variation as 7°W.
2. Positions of the landmarks are approximate and are for identification purpose only.
3. Use Luminous range diagram as necessary.
4. Use Admiralty Tide Tables for 1992.

PART – A:

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING THREE:

(30 MARKS EACH)

Q.1 Explain the process of preparing passage plan.

Q.2 Following 3 bearing were observed of Bill of Portland light (50°30.8'N 002°27.4'W)

1000 hrs	340°True	Vessel was 10' of from Bill of Portland light.	
1024 hrs	002°True	1054 hrs	028°True

Course steered by vessel was 265°True, engine speed was 12 knots.
Find CMG, set and drift of vessel and vessel's position at 1054 hrs.

Q.3 1200 hrs vessel observes radar distance of Berry head light (50°24.5'N 003°28.8'W) was 6' same vessel again at 1230 hrs observes radar distance of Start point light (50°13.4' 003°39'W) was 5'. Dunning time interval between 1200hrs to 1230hrs course steered by vessel was 175°(T), engine speed was 12 knot. Current was setting 270°(T) at rate 2knot. Find out vessel's position at 1200 hrs at 1230 hrs.

Q.4 At 1800 hrs vessel was in DR position Lat 50°12'N long 002°30'W.
Observes following star sight:
Star A Azimuth 128°T, intercept 2' Toward
Star B Azimuth 210°T, intercept 1'Away
Find out vessel's position at 1800 hrs.
From 1800 hrs position find out course to steer to reach 6' south of anvil point light.
Current was setting throughout 150° True at rate 2knot. Ship's speed 12 knots.

PART B:

ALL QUESTIONS ARE COMPULSORY

Q.5 From the following log abstract find the course and distance made good from noon to noon. At noon a point of land in 50°25.5'S 179°40'W, bore 338° C, distance 16nm and the ship's head 079°C.

		Deviation	Variation	Log
Set Course	028°C	6°E	12°E	0
1600 h A/Co	248°C	7°E	12°E	32
2000 h A/Co	079°C	14°E	12°E	62
2400 h A/Co	343°C	4°E	14°E	96
0400 h A/Co	188°C	1°E	14°E	126
0800 h A/Co	051°C	8°E	14°E	157
NOON		--	--	190

Throughout the above period, the current set 082^{0T}@1Kn. Also, find the position at next noon.

Q.6 Find the initial and final course and great circle distance from Lizard point (49°50'N 005° 12'W) to Barbodas (13°06'N, 059°20'W).

Q.7 Find the earliest time to sail out of Walnut Groove (Sacramento River, ATT Vol.3), after 7 'o' clock in the morning of the 17th Feb '92. Master wants a height of tide at least 1m, at the time of sailing.

Q.8 Draw the chart symbol which are used on B.A. Charts for the following:
a) Gas Supply pipeline
b) Fish haven
c) Limit of safety zone around offshore installation
d) Wreak, depth unknown dangerous to surface navigation.
e) Rock awash at chart datum
f) Ocean current
g) No bottom found until 250m depth
h) Submarine power cable
i) Quarantine anchorage area
j) Over falls, tide rips.   (20 Marks)

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GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours	PASS MARKS: 140	MAX. MARKS: 200

Notes:

1. Use Chart BA **5047** and Admiralty tide tables for 1992.

2. Positions of the landmarks are approximate and are for identification purpose only.

3. Where not mentioned in the questions, the vessel's speed is 12 kts.

4. Use Luminous range diagram as necessary.

PART – A:

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING THREE:

(30 MARKS EACH)

Q.1 Your vessel is having a draft of 11 mtrs and a speed of 12 kts. Your vessel is equipped with Radar, ARPA, GPS and Doppler. The ECDIS is not in operation.

Plan a safe passage from Port Talbot Pilot station (51° 29.0'N, 004° 00.0'W) to Bristol Pilot station (51° 21'N 003° 19'W) taking into account fishing traffic in the area and visibility of 3 miles for the entire route.

Q.2 Nash Point Lt. (51° 24.2'N, 003° 33.0'W) bore 016^O(T) distance off 5.2' at 2000 hrs. Find the course to steer and course to make good from this position so as to first sight Scarweather Lt. Vl. (51° 27.1'N 003° 56.2'W) right ahead. Meteorological visibility 5 miles, current setting 180° (T) rate 3 kts.

Q.3 A vessel steering 035^O(T) observes Hartland Point (51° 01.0'N 004° 32'W) to bear 078^O(T) at 2000 hrs. The same light bore 123^O(T) at 2020 hrs. At 2050 hrs the same light bore 190^O(T) while at the same time Lundy is South lt. (51^O09.5'N, 004° 39'W) bore 283^O(T). Find the course made good, speed made good and the position at 2000 hrs.

Q.4 From a vessel at anchor the following bearings were observed:

Watch Tower (51° 42.0'N, 004° 20'W)	051^O(C)
Rhossill Downs Tower (181) (51° 35'N 004° 17'W)	111^O(C)
Helwick Lt. Vsl. (51° 31'N 004° 25'W)	175^O(C)

Find the vessel's position and the deviation for the ship's head if the variation was 6^OW.

PART B:

ALL QUESTIONS ARE COMPULSORY

(Question Nos: 5,6,7 carry 30 Marks each: Question No. 8: 20 Marks)

Q.5 On 13th March 1992 at 1200 hrs, the lighthouse in position 02° 26'S, 178° 37'W was 9 miles off and its bearing was 200°(T). The ship then sailed at 12 knots on the following courses:

Time from	Compass Course	Deviation	Variation	Wind	Leeway
1200	295°	2°W	3°E	SW	2°
2000	326°	4°W	3°E	SW	4°
0400	345°	5°W	3°E	W	4°
1200	010°	3°W	3°E	W	3°

At 1900 hrs the ship stopped for 1 hour and at 2400 hrs clocks were retarded by 30 minutes. Calculate the estimate position at 1200 hrs on 14th March 1992.

Q.6 A ship sails on a Great Circle track from position 24° 00'N, 074° 15'W to position 46°N, 053° 45'W. Calculate the initial course & the great circle distance.

Q.7 Draw the following chart symbols:
a) Isolated Danger Mark
b) Anchoring Prohibited
c) Single Point Mooring (Fixed)
d) Wreck with Mast Visible

Q.8 A vessel drawing 2 mtrs fwd and 2.8 mtrs aft has to cross a sand bar sounding marked 1 mtr on the chart with a UKC of 2.5 mtrs. At Liverpool (ATT 1) on 16th March 1992. Find the earliest time on the rising tide that she can do so.

***************************X***X***************************

GOVERNMENT OF INDIA

Date: - 6th Sept-2022

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:

1. Use Chart **5048** (Ireland – South coast), Deviation card No. 1; HE 10 m, Engine Speed 12 knots if not mentioned in the question. Variation 2^OE.

2. Positions of the landmarks are approximate and are for identification purpose only.

3. Use luminous range diagram as necessary.

4. Use Admiralty Tide Tables for 1992.

PART – A:

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING:

(30 MARKS EACH)

Q.1 A vessel at anchor observes the following compass bearings:

    a} Old Head of Kinsale Lt.   (51° 36.2'N 008° 32'W)   : 278^O(C)

    b} Roche's Pt. Lt.   (51° 47.5'N 008° 15'W)   : 338^O(C)

    c} Bally cotton Isl. Lt.   (51° 49.5'N 007° 59'W)   : 023^O(C)

Find the vessel's position and the deviation on the ship's head if the variation was 6^OW.

Q.2 A vessel on a course of 270^O(C) observes at 2000 hrs Kinsale – A East Platform (51° 22'N, 007° 57' W) to bear 218° (C). At 2020 it bore 183^O(C) and at 2040 hrs it again bore 137^O(C) while the Kinsale – B West Platform (51° 21.5'N, 008° 11'W) bore 172^O(C). Find:

a) Ship's position at 2000 hrs and 2040 hrs

b) Set and drift of the current

c) Course and speed made good.

Q.3 At 1800 hrs after dropping Pilot at Waterford harbor Pilot station (52° 09.2'N 006° 58.2'W) a vessel steered a course of 180^O(T), Meteorological visibility was 5nm throughout.

Master altered course as soon as Pilot lookout is last sighted, to pass Mine head light (51° 59.5'N, 007° 35'W) 5nm on her Stbd. side. If current was setting 120^O(T) at 2 kts throughout, find the time of alteration of course and the second course steered.

Q.4 An Oil tanker with maximum draft of 12 mtr. Disembarked her pilot at VLCC pilot station in position 51° 45'N, 008° 15.2'W. Plan a passage from this position to join the North East bound lane of St. George Channel TSS. Course and distances for each leg, alteration points, way points, No-Go areas, parallel indexing, W/O point, R.F. away and S.B. Engines to be marked on the chart and written on the answer sheet.

PART B:

ALL QUESTIONS ARE COMPULSORY
(Question Nos: 5,6,7 carry 30 Marks each: Question No. 8: 20 Marks)

Q.5 On 13th Jan a light house in position 20° 30'S, 179° 30'W bore 125° T, range 20 miles. Ship set following courses thereafter. Find the course and distance made good noon to noon and EP on 14th Jan noon.

	C Co	Dev	Var	Wind	Leeway	Log
13th N/N/Co	220°	3°E	3°E	Sly	2^O	0
2000 hrs A/C	162°	Nil	3°E	Sly	3°	100
14th 0800 hrs A/C	320°	3°E	4°E	Ely	2^O	220
1200 hrs A/C	140°	3°E	4°E	Ely	2^O	270

A SW x W'ly current @ 2 kts was experienced throughout. Check were advanced 1 hr at midnight and ship had engine breakdown from 0430 hrs to 0500 hrs.

Q.6 Find Great circle distance, initial course and position of vertex from position 20°N, 075°W to 45°N, 050°W.

Q.7 A vessel drawing following drafts of Fwd 6.0m, Aft 7.0m, has to clear the bar of charted depth of 6m at Bombay (#4359) on 15th Feb 1992 with UKC of 2m. Find the earliest time in the evening when the vessel can do so.

Q.8 In your answer script, draw neatly the following symbols (Use pencil only)
a) Wreck – Mast Visible
b) Isolated Danger Mark
c) Fairway buoy
d) Local magnetic anomaly upto 9 degrees either side
e) Radio calling in point

*************************X***X*****************************

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours	PASS MARKS: 140	MAX. MARKS: 200

Notes:

1. Use Chart **5072** (Flasterbo to Orland), Deviation card No. 3; HE 10 m and Variation 4°W, Engine ship speed 12 knots if not mentioned in the question.

2. **Positions of the landmarks are approximate and are to be used for identification purpose only.**

3. Use luminous range diagram as necessary.

4. Use Admiralty Tide Tables for 1992.

PART – A:

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING:

(30 MARKS EACH)

Q.1 Consider you are on a fully loaded tanker with maximum draft of 19m. (Normal Sea speed 15 kts). Plan a safe passage from Simrishamn pilot station (55° 33.5'N, 014° 24.0'E) to kullagrund pilot station for deep draught tankers (55° 13.3'N, 013° 23.5'E), keeping in mind the UKC of **MIN 2.0 MTR.** Good visibility & strong N'ly winds prevails. Your vessel is fitted with all the required navigational equipment's and all are in good working condition. Show clearly courses to be steered, distance and all the way points on the chart recording their co-ordinators in the answer booklet as well. How long will this passage take basis steaming at sea speed? **(30)**

Q.2 A vessel near Hammerodde Lt. Ho. (55° 18'N 014° 47'E) observes the bearing of the Lt. Ho. As 137^O(T). At the same time the vertical sextant angle was observed to be 12.6'. If the tide had fallen by 2 m below MHWS and the index error was 2' on the arc, find the position of the vessel. Thereafter, with the current setting 345° (T) at 2 knots, the vessel steered a course of 258^O(T). Find the course and speed made good and also the distance off from Sandharmmeren Lt. Ho. (55° 23'N 014° 12'E) when it is abeam to stbd. **(30)**

Q.3 Vessel anchored off YSTAD observes the following:

ABBEKAS LIGHT	(55° 23'N 13° 37'E) – 298° (C)
YSTAD SOUTH	(55° 25'N 13° 49'E) – 009° (C)
KASEBARGA LIGHT	(55° 23'N 14° 04'E) – 078° (C)

Find the compass error and position of the vessel. From this position find a compass course to steer to pass Hammerodde lighthouse **55° 18'N, 014° 47'E** 2 miles off counteracting a current of 060° x 2 knots and a strong northerly wind causing 5° leeway. **(30)**

Q.4 While steering a course of 228^O(T) Olands Sodra Grund Racon light (56° 04'N 016° 42'E) was last sighted at 2100 hrs, when visibility was 5 M only. At 2200 hrs, Utklippan Lt. (55° 57'N, 015° 41'E) was first sighted, visibility remaining the same. Current was known to be setting 013^O(T) at 2.5 knots throughout. Find the vessel's position at 2100 hrs and 2200 hrs and also the time and position when Utklippan light will be last sighted. **(30)**

PART B:

ALL QUESTIONS ARE COMPULSORY

Q.5 Following courses and distances were steamed by a vessel doing 15 kts, between Noon of 15th Jan till Noon of 16th Jan. The noon position on 15th Jan was observed to be 10° S, 45° E.

Time	Compass Co.	Variation (deg E/W)	Deviation (Deg) E/W
1200 – 1800	150°C	2°E	3°E
1800 – 2400	135°C	2°E	5°W
0000 – 0600	090°C	2°E	6°E
0600 – 1200	120°C	2°E	3°W

Calculate expected Noon position for 16th January. **(30)**

Q.6 a) If a ship departs from position 46° 14'N, 125° 36'W on a course of 237°T and covers 7076', find the position reached (by Mercator Sailing). **(25)**
b) A ship in position 41° 10'S 032° 45'W is steering a course of 090°T at a speed of 16 knots. Find the longitude reached after 22 hours of steaming.

Q.7 A vessel having a draft For'd 6 m, aft 7 m wants to clear a bar (charted depth 6m), at Bombay (# 4359) on 15th February 1992 with a UKC of 2m. Find the earliest time in the evening. **(30)**

Q.8 Draw the following symbols in your answer sheet:-
a) Fairway buoy
b) East Cardinal Mark
c) North Cardinal Mark
d) Wreck dept unknown and dangerous to surface navigation, and
e) Submarine power cable. **(20)**

***************************x***x***************************

GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours **PASS MARKS: 140** **MAX. MARKS: 200**

Notes:

1. Use Chart **5056** (Start point to the needles), Deviation card No. 2; HE 12 m; Engine speed 12 knots if not mentioned in the question. Variation as 7°W.

2. Positions of the landmarks are approximately and are for identification only.

3. Use luminous range diagram as necessary.

4. Use Admiralty Tide Tables for 1992.

PART – A:

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING:

(30 MARKS EACH)

Q.1 A vessel dropped pilot at VLCC pilot station (51° 45' N 008° 15'W). You were experiencing bad weather. Plan a passage to Tarmore Bay W of Browston Head to a position 52° 07.6' N. 007° 08.6'W. The vessel is equipped with all latest nav. Aids. Ship speed 14 kts. And max draft of 10 mtrs. Demonstrate the art of passage plan along the coast.

Q.2 A vessel coming out of St. George's channel TSS, the following compass bearing were observed at 0800 hrs. TUSKAR ROCK LT. HOUSR: 020^O(C), CARNSORE PT TIP: 320^O(C). LITTLE SALTEEE ISLAND SOUTH TIP: 275^O(C). Find the position of the vessel at 0800 hrs and the deviation of the compass if the variation was 2 deg W.

Q.3 A vessel steering a course of 094(T) at 0900 hrs. Mine head pt. Lt< (51° 49.5'N 007° 35'W) bore 049(T) at 0930 hrs it bore 354(T) and again at 1010 hrs it bore 318(T). During the period the current was setting 176(T) at 4 kts. Find the vessel's position at 0900 hrs and 1010 hrs and the engine speed of vessel and the course made good.

Q.4 A vessel off Balley cotton gas field in Dr. Position 51° 30.0'N, 008° 06.0'W a star gave azimuth 330 (T) 2 miles towards. There after the radar was in operational and vessel encountered restricted visibility. Find the safe courses to steer so as to reach 2 miles off old head of Kinsale lt house. Also find the distance steamed on the first course. The vessel's speed was 10 kts is reduced visibility and the current was setting 215(T) at 2 knots. What is the principle involved?

PART B:

ALL QUESTIONS ARE COMPULSORY

Q.5 On 10th Feb, the noon position was 18° 52.0N, 0072° 52.0'E. The vessel steamed as follows:

Time	Course (G)^O	Gyro Error^O	Speed by log
1200	237	1H	15.0
a/c 1700	283	1L	16.0
a/c 2000	262	Nil	15.0
a/c 0400	197	1L	14.5
1200	197	1L	15.0

At 0200 clocks were retarded by one hour.

Find i) the DR position at Noon on 11th Feb.

If at noon on 11th Feb, the fix was 15° 50.0'N 068° 26.0'E, find ii) set and drift of current.

Q.6 Find the initial course, distance and final course from position 24° 00' N 074° 30'E to 48° 00'N 145° 18'E.

Q.7 A vessel at port Hedland, having a draft F: 6.0m, A: 8.0m wishes to cross a shoal marked 4m on the chart with an under keel clearance of 1m. Find the earliest time on the rising tide of 16th April 1992 she can do so?

Q.8 Implement the following correction on chart.

a) Wreck over which exact depth is unknown but which is considered to have a safe clearance at depth 20m in position 51° 34'N, 008° 04.0'W.

b) A quarantine anchorage centered in position 51° 54.0'N, 007° 47.2'W to a radius of 1.00 NM.

c) Historic wreck and restricted area in position 51° 27.0'N, 007° 50.0'W centred 1 NM.

d) Submarine power cable in position 52° 04.8'N, 007° 19.5'W extending to adjoining coast in a direction 020 deg.

*************************x***x*****************************

GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use Chart **5072** (Falstrebo to Oland), Deviation card No. 2; HE 12 m; Engine speed 12 knots if not mentioned in the question. Variation as per chart.
2. **Positions of the landmarks are approximately and are for identification only.**
3. Use luminous range diagram as necessary.
4. Use Admiralty Tide Tables for 1992.

PART – A:

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING:
(30 MARKS EACH)

Q.1 Your vessel having a draft of 18.5 m and speed of 16 knots, drops pilot at Simrishmn pilot station (55° 33.5' N, 014° 24.0'E) and is bound for Kullagrund pilot station (55° 13.3' N 013° 23.5'E) for deep draught tankers. Good visibility and strong N'ly winds prevail. Vessel is equipped with all the required navigational equipment including ECDIS keeping in mind the UKC policy of your company, plan a safe passage for the intended voyage. Courses and all necessary details to be marked on the chart, Tabular passage plan to be written drawn on the answer sheet.

Q.2 A vessel heading 245^O(C) near Hammerodde Lt Ho (55° 18'N, 014° 47'E) observes the bearing of the Lt. Ho as 137'(C) with a Radar range of 2.2'. Find the position a course of 258^O(T). Find the course and speed made good and also the distance of from Sandhammaren Lt. Ho (55° 23'N 014° 12E) when it is abeam to stbd.

Q.3 A vessel anchored south of YSTAD observes the following compass bearings: -

SANDHAMMAREN (55^O23'N 014^O12'E) : 067^O(C)
YSTAD   (55^O25'N 013^O49'E) : 001^O(C)
ABBEKAS   (55^O23'N 013^O36'E) : 316^O(C)

Find the vessel's position and compass error.

Q.4 A ship steering 118^O(T) observes Utklippan Racon (55^O58' 015° 20'E) at 1600 hrs bearing 060^O(T). At 1620 hrs the same light bore 032^O(T) and at 1650 hrs it bore 340^O(T). Find the vessel's position at 1650 hrs, the course made good and the rate of current, if the set was 068^O(T).

PART B:
ALL QUESTIONS ARE COMPULSORY

Q.5 1st January noon time vessel was in position 00° 30'S 065° 30'E sailed on following courses till next day noon time. Find vessel's position on 2nd January noon time, Effective CMG and DMG 1200 hrs to 2000 hrs course 80° true, speed 12 knot. 2000 hrs to 2200 hrs and engine break down took place. 0400 hrs to 1200 hrs course was 150° true, speed 12.5 knot. Throughout current was setting 030°T@ 2 knots. Ship's clocks were adv, by 1 hrs at midnight.

Q.6 Vessel is on GC track between 10° 00'S, 15° 00'W to 40°N, 160° 00'E. Find out GC distance Initial course and final course.

Q.7 Find out height of tide at port Deal ATT volume 1 on date 01.01.91 at time 1400 hr L.T.

Q.8 Draw following symbols use on BA charts.
a) Fairway buoy   b) West cardinal mark   c) South Cardinal mark
d) Ocean current   e) Wreck, depth unknown, dangerous to surface navigation.

****************************X***X****************************

GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

<u>Notes</u>:

1. Use Chart **5056** (Start point to the Needles), Deviation card No. 2; HE 12 m; Engine speed 12 knots if not mentioned in the question.
2. Luminous range diagram may be provided if necessary.
3. Use Admiralty Tide Tables for 1992.
4. Position of land marks are approximate and are to be used for identification only.

PART – A:

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING:
(30 MARKS EACH)

Q.1 Your vessel a VLCC Tanker just picked up pilot off Berry Head (50° 26'N, 003° 28'W), plan a safe passage from this position to anchor at Way mouth bay (approx. position 50° 33'N, 002° 23'W). Vessel likely to experience strong easterly gale. Plot courses on chart and mark alteration points, way points, courses and distances on each leg of passage and same to be written in the answer sheet. Maximum draft 18 mtr. Assume all navigational equipment's are working well.

Q.2 A vessel while steering a course 023^O(C) first Start Point Light (50° 13.2'N, 003° 38.5'W) at 2030 hrs in meteorological visibility of 5 n.m. Same light was last sighted at 2200 hrs. If the current was setting 159^O(T) at 2.9 kts and Height of eye of the observer is 15m, find:-
a) the position of the vessel at 2030 hrs and 2200 hrs.
b) Course made good and Speed Made good by the vessel. Variation:- 4°W.

Q.3 The following bearings were observed by a ship while at anchorage on a steady heading: -
Hope's nose (50° 27.8'N, 003° 28.8'W:- 260^O(C)).
The Ness (50° 32.2' N, 003° 29.8'W):- 301° (C)
Straight Point (50° 36.4' N, 003° 21.7' W):- 003^O(C)
Find the ship's position, compass error and deviation of the compass on this heading.

Q.4 While steering a course of 275^O(T) at 2000 hrs, Bill of Portland Lt. (50° 31'N, 002° 27.5' W) bore 000 (T) and 5 n.m. off. At 2030 hrs, same light ho bore 0450(T) and 7 n.m. off. Find the vessel's estimated position at 2100 hrs. At 2100 hrs vessels stopped for 1.5 hrs due to engine break down. From the 2230 hrs position, find compass course to steer to reach. Exmouth Pilot station (50° 36' N, 003° 22' W) counteracting the same current from 2000 hrs onwards.

Q.5 On 5th January, a ship in position 08° 22' N, 112° 20'E steered the following courses: -

Time	COMP CO	DEV^n	WIND	LEEWAY	SPEED (KTS)
1200	100°	1°E	SWXW	3°	10
1600	120°	2°E	SW	2°	10
2000	110°	2°E	SW	2°	8
2400	120°	2°E	SW	2°	8
0400	150°	5°E	S	---	10
0800	150°	5°E	S	---	8
1200					

Variation 12°E throughout. Find the DR position at Noon on 6th January. If at Noon on 6th Jan Observed position was found 05° 20' N, 114° 48.6' E, find set and drift of the current experienced.

Q.6 a) Find the total G.C. distance, the initial course from position 'A' 41° 00' S, 175° 00' E to Position 'B' 33° 00' S, 071° 30'W.

b) A vessel steams due east from 'A' in Long 060°W to Position 'B' in Long 020° 00' W. If the distance steamed is 1956 n.m., find the Latitude of 'A' and 'B'.

Q.7 Find the height of tide at 0900 hrs local time at dover on 3rd March.

Q.8 a) Write short notes on:-
i) ISO phase and occulting lights   ii) Cardinal Marks

b) Write chart symbols:-
i) No bottom found at the depth of 50m.   ii) depth of water 25m found by wire drag or wire swept   iii) submarine cables   iv) wind mill   v) drying height 0.5 m.

****************************x***x****************************

GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:

1. Use Chart **5047** (Bristol Channel), Deviation Card No. 2, HE: 10 m, Engine Speed 12 knots if not mentioned in the question. Variation as per chart.

2. Positions of the landmarks are approximate and are for identification only.

3. Use luminous range diagram as necessary.

4. Use Admiralty Tide Tables for 1992.

PART – A:

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING:

(30 MARKS EACH)

Q.1 A Vessel sailed out from Port Talbot, with maximum draft of 12 mtrs, drops pilot in position 51° 30' N 003° 55' W and is bound for Cardiff.

Prevailing weather: Visibility 5nm and Sw'ly winds with 20 knots speed.

Vessel is equipped with Radar, ARPA, Echo sounder & Doppler Log. Plan a safe passage to reach Cardiff pilot station (51° 21'N 003° 19'W).

Plot the courses on the chart, with clear marking of course & distance for each leg of passage. Also course alteration points should be marked on the chart.

Q.2 At 2200 hrs a vessel in position 51° 05'N 004° 35'W sailed on a course of 273^O(G) at 12 knots. At 2230 hrs North Lundy Is. Lt. (51° 12'N 004° 40.5'W) was observed for the first time at 2300 hrs, South Lundy Is Lt. (51° 09.5'N, 004° 39'W) was just obscured. H.E. 12m. If gyro error was 2^O Low, find:

a) The vessel's position at 2300 hrs   b) Set and drift of the current.

Q.3 A vessel observers St. Gowan light vessel (51° 30'N 005° W) to bear 260^O(C). At the same time St. Govan's Head (51° 36'N 004° 55.5'W) bore 300^O(C), Caldey Island light (51° 38'N 004° 41' W) bore 045^O(C). Find vessels position & calculate deviation. (Var: 1^{O}E)

Q.4 At 2000 hrs. Lundy Island North light bore 180^O(T) x 8'. Find the position of vessels? From this position find CTS to raise Helwick Lt vessel (10m) right ahead with Current setting 270^O(T) @ 2 knots. Find:

a) Position when Lt Vessel is right ahead   b) Course to steer   c) CMG / SMG

PART B:

ALL QUESTIONS ARE COMPULSORY

Q.5 1st March noon time, a ship was in position lat 45° 30' S 175° 30' E steamed following courses. At 1200 hour course was 150°T, 1800 hours changed to 180°T, from 2200 hrs to 2300 hrs engine breakdown took place, at 2300 hrs vessel resumed in course 180°T, next a/co was made at 0400 hrs to 210°T which continued till noon time. Find our EP position on 2nd March noon time, CMG and DMG between 1st march noon to 2nd march noon time. [Engine speed throughout 12 knot].

Q.6 Find out initial course, final course, position of vertex between 23° 00' N 074° 00' W to 45° 00' N 104° 00' W.

Q.7 Find out tide at 1048 hrs on 10th April 1992 at port drummore (ATT 1 No. 420).

Q.8 a) Admiralty weekly notices to mariner No. 2 of 2019 has following permanent chart correction for chart No. 5047. Correction No. 100.

Wreak dangerous for surface navigation in position 51° 30' N 004° 42'W.

Carry out the correction and make necessary entries [use pencil for correction] assume this chart is up to date and correct for all notice issued prior to ADM WNM No. 2 of 2011.

b) Write short notes on following: Chart corrections through Permanent Notices, Temporary notices and Preliminary notices.

**************************X***X****************************

GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:

1. Use Chart **5056** (Start point to the Needles), Deviation Card No. 2, Engine Speed 12 knots if not mentioned in the question.

2. Positions of the landmarks are approximate and are for identification only.

3. Use luminious range diagram as necessary.

4. Use Admiralty Tide Tables for 1992.

PART – A:

Note: Question No. 1 is compulsory. Attempt any two questions from the remaining three questions of this part. All questions carry 30 marks each in this Part.

Q.1 Vessel dropped pilot at 51° 45'N 007° 15'W. Her max. draft is 14m and is bound for North East bound lane of St. Georges Channel TSS. Max engine speed 13kts. Visibility is 8 miles with light rains. Vessel is equipped with all latest navigational aids. Plan a safe passage for above situation indicating courses, distances, waypoints, other required information etc. on the chart and in answer sheet.

Q.2 While steering 056^O(G), Old Head of Kinsale Lt. (51° 36.3'N 008° 31.8'W; F1 (2) 10s 72m 25m) at 1000 hrs bore 001^O(G), at 1030 hrs bore 313^O(G), at 1100 hrs bore 271^O(G). Current setting W'ly, Gyro error 1^O(H), Engine Speed 10 kts.

Find the a) Course & Speed made good   b) Position at 1000, 1030 & 1100 hrs

c) Drift of current

Q.3 At 1400 hrs, following compass bearings were observed by the vessel

* Ballycotton Island Lt. (51° 49.5'N, 007° 59'W) 294^O(C)

* Capel Island (51° 52.8'N, 007° 51.2'W) 338^O(C)

* Ram Head (51° 56.3'N, 007° 42.4'W) 008^O(C)

Determine ships position and compass error

Q.4 At 1800 hrs, while steering 251^O(G), Coninbeg Racon M (52° 02.4'N, 006° 39.4'W) was observed 10' off. At 1900 hrs Hook Head Racon 'K' (52° 07.4'N, 006° 55.8'W) bore 051° (G).

Current was known to be setting S'ly @ 2kts. Determine ship's position at 1800 & 1900 hrs, Gyro error 1^O(H).

PART B:

ALL QUESTIONS ARE COMPULSORY

Q.5 Following courses and distances were steamed by a vessel doing 15 knots, between noon of 1st Feb till noon of 2nd Feb. The noon position on 1st Feb was observed to be 10^ON 30^OE.

Ship's Time	Compass course (deg)	Variation (deg) E/W	Deviation (deg) E/W
1200 – 1800	150	3^OE	2^OE
1800 – 2400	135	3^OE	6^OW
0000 – 0600	090	3^OE	5^OE
0600 – 1200	120	3^OE	4^OW

Clocks were advanced for 1 hr at between 0300 hrs. Current setting 240° x 2.5 kts was experienced throughout. Calculate the noon position arrived at on 2nd Feb when above courses were steered and distances steamed.

Q.6 Calculate the Great Circle distance, initial & final course between 10^ON, 40^OE and 30^ON, 100^OE.

Q.7 Calculate the height of tide at Richmond (ATT Vol. 2, #2821) on 29th March 1992.

Q.8 Draw following symbols as used on BA charts.

a) Fairway buoy   b) East cardinal mark   c) North Cardinal mark

d) Submarine Power Cable   e) Isolated danger mark   (20 Marks)

************************X***X****************************

GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours	PASS MARKS: 140	MAX. MARKS: 200

Notes:

1. Use Chart **5047** (Bristol Channel), Deviation Card No. 2, HE 12 m, Engine Speed 12 knots if not mentioned in the question, Variation 4°E.

2. Positions of the landmarks are approximate and are for identification only.

3. Use luminious range diagram as necessary.

4. Use Admiralty Tide Tables for 1992.

PART – A:

Note: Question No. 1 is compulsory. Attempt any two questions from the remaining three questions of this part. All questions carry 30 marks each in this Part.

Q.1 A vessel having draft of 11m drops pilot at Bristol Pilot Grounds (51° 21'N, 003° 19' W) in gale force winds and is bound for Swansea (51° 32' N, 003° 57' W) while the vessel is equipped with ARPA, Echo sounder, Doppler Log. She is also experiencing steering problems. In view of the above, plan a safe passage for the intended voyage.

Q.2 A ship steered 020° (T) at 12 kts. Following bearing were obtained of North Lundy Light (Lat 51° 12.5'N, Long 064° 40' W), 2100 hrs 083^O(T), 2130 hrs 121^O(T), 2148 hrs 139° throughout, find the Course to steer and engine speed required to reach Port Talbot Pilot station (51° 29'N, 004° 00'W) at 0100 hrs next day.

Q.3 At 0600 hrs, a vessel anchored at Carmarthen Bay observes the following:

Watch tower (51° 42'N, 004° 20'W) ………………………………… 045° (C)

Rhossili Down Tr (189) (51° 35'N, 004° 17'W) ……………………. 118° (C)

Helwick Lt Vessel (51° 31'N, 004° 25' W) ……………………………. 180° (C)

Find the a) Compass Error   b) Position of the vessel

Q.4 At 0800 has a vessel observes Foreland point Lt. Ho (51° 14.5'N, 003° 47'W) to bear 157^O(G) and 5 n.m. off by radar. At the same time Nash Pt. Lt. Ho. (51° 24'N, 003° 33'W) was observed to be 12 n.m. off by radar. From the above positions set Gyro course to first sight. Helwick Lt. Vessel (51° 30.5'N, 004° 26'W) 30° on STBD bow in prevailing meteorological visibility of 2 miles.

PART B:

ALL QUESTIONS ARE COMPULSORY

Q.5 Calculate the Initial course, final course and distance along the GC track from position 'A' 35° 40'N, 141° 00'E to position 'B' 45° N, 174° 51.8' W.   (30 Marks)

Q.6 Find the height of tide at 1200 GMT at Gentbrugge (ATT 1) (#1539∆) on 6th day of March 1992.

(30 Marks)

Q.7 Draw the following chart symbols

a) Underwater rock of unknown depth, dangerous to surface navigation.

b) Wreck showing any portion of hull or superstructure at level of chart datum.

c) Radio Reporting point

d) Submarine Cable

e) A Pilot point. (20 Marks)

Q.8 From the following log abstract find:-

a) CMG, DMG noon to noon   b) position arrived at next Noon.

On 20th January Noon Position Lat:- 20° 30'N, Long:- 040° 20'E

Time	Comp Co.	Var^n	Dev^n	L'way	Wind	Log
1200 Set Co	283°	3°E	5°W	3°	NE	000
2100 A/C	044°	4°E	2^{O}E	2^{O}	N	111
0100 A/C	067°	5°E	4°E	4°	N	149
0800 A/C	340°	5°E	2^{O}W	1^{O}	N	206
21st N/N						256

Current was setting SE ly @ 2 kts throughout. Clocks were advanced by 1 hour at midnight.

(30 Marks)

**************************X***X*****************************

GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

<u>Notes</u>:

1. Use Chart **5056** (Start point to the Needles), Deviation card No.2. HE 10m and variation as per chart. Ship speed 12 knots if not mentioned in the questions, unless speed in the question.
2. Luminous range diagram may be provided if necessary.
3. Use Admiralty Tide Tables for 1992.
4. **Position of landmarks are approximate and are to be used for identification purpose only.**

PART – A:

QUESTION NO.1 IS COMPULSORY. ATTEMPT ANY 2 QUESTIONS FROM THE REMAINING:

Q.1 a) Describe briefly what you understand by Passage Planning?   (15)

b) How would you plan your passage after dropping Needless pilot (50° 38'N, 001° 39'W) to pick up Exmouth Pilot (50° 36'N, 003° 21.5'W) and list the Admiralty publications which you would prefer to.   (15)

Q.2 At 2000 hrs Channel Lt Vessel (49° 55'N, 002° 55'W) and East Channel Racon Buoy (49° 59'N, 002° 29'W) were equidistant on the radar. Vessel was steering a course of 025^OT at 12 kts. Wind was Northerly causing a leeway of 5°. A tidal stream was setting in the direction of 180^OT at 2 kts. At 2220 hrs Bill of Portland Lt (50° 31'N, 002° 27'W) was found to be 10' off on the radar. Find CMG (Course Made Good), SMG (Speed Made Good) & position of the vessel at 2220 & 2000 hrs.

Q.3 At 2000 hrs Channel Lt Vsl (49° 55'N, 002° 55'W) was raised and at 2100 hrs the same light was last sighted when the meteorological visibility was 5' only. During this interval the vessel was steering 045^OT at 11 kts. NW'ly wind was causing a leeway of 5°. Current was setting in a southerly direction at 2 kts. Find the following:

a) Raising & last sighted distances of Channel Lt. Vessel.

b) Position of the vessel at 2100 & 2000 hrs, HE 4m.

Q.4 a) At 0200 hrs straight Pt. Lt. (50° 36.6'N & 003° 21.7'W) bore 300^O(T) when the vessel crossed 30m contour. Find the ships position. From this position find the course to steer to pass Bill of Portland Lt. (50° 31'N, 002° 27'W) 9' off to port. Engine speed 12 kts. Vessel experiencing a NE'ly wind causing a leeway of 5°, current setting 180^O(T) x 2 kts. Also, find the time & position, when the vessel will pass Bill of PORTLAND light 9 off. Engine speed 9 kts.

ALL QUESTIONS ARE COMPULSORY

Q.5 A vessel sailed from lat 27° 12'N, long 178° 42'E doing 15 kts by engines. She steered 067^O(C), (Dev 3^OE), for 10 hours. Course was then altered to 096° (C) (Dev. 1^OE), and this course was maintained for 8 hours, thereafter she steered, 230° (C), (Dev 3^OW) for another 6 hours, find the position arrived, if she experienced a current setting 324^O(T) at 2.5 knots throughout. Also find the course and distance she made good. Variations 7^OW throughout. **(30)**

Q.6 A ship in position 04° 45'N, 081° 13'W is to follow a great circle, track to 41° 48'S, 176° 35'E. find: a) G. C. distance   b) Initial Course   c) Final Course   **(30)**

Q.7 Find the height of tide at 1030 hrs on 16th March 1992, at Hilbre Island (#461)   **(30)**

Q.8 Draw the following chart symbols:
a) Underwater rock of unknown depth, dangerous to surface navigation.
b) Wreck showing any portion of hull or superstructure at level of chart datum.
c) Radio reporting point
d) Submarine Cable
e) A Pilot Point

*************************X***X***************************

GOVERNMENT OF INDIA

Date: - 2nd December-2021

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

<u>Notes</u>:

1. Use Chart **5047** (Bristol Channel), Deviation card No.2. HE 12m and variation as per chart. Ship speed 12 knots if not mentioned in the questions.

2. Luminous range diagram may be provided if necessary.

3. Use Admiralty Tide Tables for 1992.

4. Position of landmarks are approximate and are to be used for identification purpose only.

PART – A:

QUESTION NO.1 IS COMPULSORY. ATTEMPT ANY 2 QUESTIONS FROM THE REMAINING:
(30 MARKS EACH)

Q.1 Plan a safe passage providing all the details from Port Talbot pilot station to Cardiff pilot station. Plot the courses on chart and mark accordingly for a vessel drawing 12 mtrs draft.

Q.2 At 1700 hrs Nash Point Light (51° 24.2'N, 003° 33.1'W) was 6 miles off by radar & at 1745 hrs Seaweather Light vessel Light (51° 26.8'N, 003° 56.2'W) was 4 miles off by radar. During this period the vessel steered a course of 290^O(C) and experienced a current setting 170^O(T) at 4 knots and Northerly wind caused leeway of 5°. Determine the vessel's position at 1700 hrs and 1745 hrs.

Q.3 At 1100 hrs, a vessel steering a course of 080^O(T), Porteymon Pt. (43) (004° 13'W, 51° 31.5'N) bore 030^O(T), at 1130 it bore 000^O(T) and at 1200 bore 330^O(T). Determine course and speed made good and the rate of current if the current was setting south.

Q.4 a) At 1900 Hrs ship in DR position 51^O20'N, 004^O20'W observing following: Star A Azimuth 218^O(T) x 2' Towards, Star B: Azimuth 143^O(T) x 1.5 toward. Find the vessel Position at 1900 Hrs.

b) From 1900 Hrs position vessels intends to reach 5.5' North of Hartland point. Current was setting south at 2 Knot. Find the compass course to steer?

PART B:

ALL QUESTIONS ARE COMPULSORY

Q.5 On 21st June @ N/N Position 20° 15'S, 160° 30'E from the following log abstracts find

- Course & distance made good noon to noon

- Position arrived at noon on 22nd June

Time	Compass Co.	Variation	Deviation	Leeway	Wind	Speed
Noon	313°C	3°E	3°E	3	N	12.5
2000 A/c	022°C	3°E	2°W	3	N	12.3
0200 A/c	075°C	3°E	6°E	Nil	NE	13.1
0800 A/c	123°C	3°E	1°E	3	E	14.0

Current was setting SW @ 2.5 knots throughout, Engine breakdown from 0400 hrs to 0600 hrs and clocks retarded by 1 Hr at Midnight. **(30 Marks)**

Q.6 Find the distance, initial course and the final course on great circle from position 24° 00'N, 074° 15'W to 46°N 053°45'W. **(30 Marks)**

Q.7 Calculate the UKC for a vessel drawing drafts of F = 9m and A= 10m. When she passes over shoal charted 10m at St. John (Att Vol II. #2864) at 0400 on 7th Feb 1992. **(30 Marks)**

Q.8 Define the following:

a) Chart Datum   b) Routing Charts   c) Isogonic – Lines

d) Drying Heights   e) ODAS Buoy.   **(20 Marks)**

**************************x***x**************************

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours	PASS MARKS: 140	MAX. MARKS: 200

<u>Notes</u>:

1. Use Chart **5072** (Flasterbo to Orland), Deviation card No.2. HE 10m, Engine Speed 12 knots, if not mentioned in the question. Variation 6°W.

2. Luminous range diagram may be provided if necessary.

3. Use Admiralty Tide Tables for 1992.

4. Position of landmarks are approximate and are to be used for identification purpose only.

PART – A:

QUESTION NO.1 IS COMPULSORY. ATTEMPT ANY 2 QUESTIONS FROM THE REMAINING:

(30 MARKS EACH)

Q.1 A container vessel with maximum draft of 8.5 mtr sailed out from Ahus harbor. She disembarked her pilot in position 55° 53.4' N, 014° 35.7'E. From this position, plan your safe passage to join north-east bound traffic lane of Olands Sodra Grund TSS. During the passage vessel should pass Utklippan light with minimum distance of 6 miles. Courses to be plotted on the chart, with clear marking of course and distance for each leg of passage. Also each course alteration points should be clearly marked on the chart. Write a brief summary of passage plan in the answer sheet.

Q.2 A ship steering 284°T, at 0900 hrs Sandhammaren Lt. (55° 23'N, 014° 11.8E) bore 311°T, at 0940 hrs it bore 352°T and again at 1010 hrs it bore 038°T. During this period the current was setting 190°T at 2 knots. Find following:-

a) Position at 0900 hrs and 1010 hrs   b) Engine speed

c) Course made good

Q.3 At 1900 hrs, a vessel steering a course of 300°(T) observes forward of beam Chritianso (S) Lt. (55° 19'N 015° 11'E) to be 7 nm. At 2030 hrs it observes Simrisham is WRG (55° 33.5'N, 0140° 22'E) to bear 302°(T). If the current was setting 000°(T) at 2 kts throughout, find the position of the vessel at 1900 hrs and 2030 hrs?

Q.4 In DR position 55° 18' N, 013° 51'E, a vessel observes following compass bearings:

a) Abbekas fishing light (55° 23.5'N, 013° 36'E)   -   303°(C)

b) Ystand light (55° 25.5'N, 013° 49'E)   -   014°(C)

c) Kaseberga light (55° 23'N, 014° 04'E)   -   077°(C)

Find (a) vessel's position   b) Deviation of ship's head.

ALL QUESTIONS ARE COMPULSORY

Q.5 At 1200 hours on 25th April 1992 a point of land in lat. 24° 37'N, long 047° 12'W bore 055^O(T), dist off by radar 5 miles, she then sailed the following courses and distances.

Gyro Co.	Gyro Error	Distance	Wind Direction	Leeway
347°	1^O High Through out	111 M	SW	3°
001°		47 M	W	Nil
187°		27 M	W	1^O

Find the estimate arrival position. If the final position by observation was 26° 27.5' N, 047° 32.2'W, find the set and drift of the current experienced and the course and distance made good.

(30 marks)

Q.6 Two vessels 45 nautical apart on the parallel of 40° 30'N steam 180° (T), at equal speeds, until the distance between them is 55 nautical miles. How far did each vessel steam?

(30 marks)

Q.7 A lighthouse at Amherst Habour (# 2877) has a charted elevation of 33 m. What will be its elevation at 1830 hrs Standard time on 22nd March, 1992? **(30 marks)**

Q.8 Following notices to mariners (Adm. NM No. 533 / 2013) were received for chart No. 5072. Do the necessary correction in the chart using correct symbols. (Use pencil only).
a) Insert 'Spoil ground' in position 56° 06.1' N, 016° 02'E.
b) Insert 'Special Mark' (Lit) in position 56° 06.1'N, 016° 02.2'E.
c) Shift the pilot boarding position from 55° 12.8' N, 015° 03.2' E to 55° 13.5' N, 015° 03.2' E to 55° s.5'N, 015° 01'E. **(20 marks)**

**************************X***X****************************

GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours	**PASS MARKS: 140**	**MAX. MARKS: 200**

Notes:

1. Use Chart **5072** (Flasterbo to Orland), Deviation card No.3. HE 10m and Variation 4°W, Engine Ship speed 12 knot, if not mentioned in the question.

2. Luminous range diagram may be provided if necessary.

3. Use Admiralty Tide Tables for 1992.

4. Position of landmarks are approximate and are to be used for identification purpose only.

PART – A:

QUESTION NO.1 IS COMPULSORY. ATTEMPT ANY 2 QUESTIONS FROM THE REMAINING:

Q.1 Consider you are on a fully loaded tanker with maximum draft of 19m. (Normal sea speed 15 knots). Plan a safe passage from Simrishamn pilot station (55° 33.5'N, 014° 24.0'E) to kullagrund pilot station for deep draught tankers (55°13.3'N, 013° 23.5'E), keeping in mind the UKC of MIN 2.0 MTR. Good visibility & strong N'ly winds prevails. Your vessel is fitted with all the required navigational equipment's and all are in good working condition. Show clearly courses to be steered, distance and all the waypoints on the chart recording their co-ordinators in the answer booklet as well. How long will this passage take basis steaming at sea speed? **(30)**

Q.2 A vessel near Hammerodde Lt. Ho. (55° 18'N, 014° 47'E) observes the bearing of the Lt. Ho. as 137°(T). At the same time the vertical sextant angle was observed to be 12.6'. If the tide had fallen by 2m below MHWS and the index error was 2' on the arc, find the position of the vessel. Thereafter, with the current setting 345°(T) at 2 knots, the vessel steered a course of 258°(T). Find the course and speed made good and also the distance off from Sandharmmeren Lt. Ho. (55°23'N 014° 12'E) when it is abeam to stbd. **(30)**

Q.3 Vessel anchored off YSTAD observes the following:

ABBEKAS LIGHT	(55° 23'N 13° 37'E)	– 298° (C)
YSTAD SOUTH	(55° 25'N 13° 49'E)	– 009° (C)
KASEBARGA LIGHT	(55° 23'N 14° 04'E)	– 078° (C)

Find the compass error and position of the vessel. From this position find a compass course do steer to pass Hammerodde lighthouse **55° 18'N, 014° 47'E** 2 miles off counteracting a current 060° x 2 knots and a strong northerly wind causing 5° leeway. **(30)**

Q.4 While steering a course of 228°(T) Olands Sodra Grund Racon light (56° 04'N 016° 42'E) was last sighted at 2100 hrs, when visibility was 5M only. At 2200 hrs, Utklippan Lt. (55° 57'N, 015° 41'E) was first sighted, visibility remaining the same. Current was known to be setting 013°(T) at 2.5 knots throughout. Find the vessel's position at 2100 hrs and 2200 hrs and also the time and position when Utklippan light will be last sighted. **(30)**

PART B:

ALL QUESTIONS ARE COMPULSORY

Q.5 Following courses and distances were steamed by a vessel doing 15 kts, between Noon of 15th Jan till noon of 16th Jan. The noon position on 15th Jan was observed to be 10°S, 45°E.

Time	Compass Co.	Variation (deg E/W)	Deviation (Deg E/W)
1200 – 1800	150°C	2^{O}E	3°E
1800 – 2400	135°C	2^{O}E	5°W
0000 – 0600	090°C	2^{O}E	6°E
0600 – 1200	120°C	2^{O}E	3°W

Calculate expected Noon position for 16th January. **(30)**

Q.6 a) If a ship departs from position 46° 14'N, 125° 36'W on a course of 237°T and covers 7076, find the position reached (by Mercator Sailing). **(25)**
b) A ship in position 41° 10'S 032° 45'W is steering a course of 090°T at a speed of 16 knots. Find the longitude reached after 22 hours of Steaming. **(05)**

Q.7 A vessel having a draft For'd 6m, aft 7 m wants to clear a bar (charted depth 6m), at Bombay (#4359) on 15th February 1992 with a UKC of 2m. Find the earliest time in the evening, when the vessel can do so. **(30)**

Q.8 Draw the following charts symbols:-
a) Obstruction with depth 11.9 m.
b) Limit of safety zone around offshore installations
c) East Cardinal Buoy
d) Radio reporting points
e) Established direction of Traffic in TSS.

*************************X***X***************************

2

TIME: 3 Hours	**PASS MARKS: 140**	**MAX. MARKS: 200**

Notes:
1. Use Chart **5048** (Old head of Kindsale to Turkar Rock), Deviation card No.2.
2. Luminous range diagram may be provided if necessary.
3. Use Admiralty Tide Tables for 1992.
4. Position of land marks are approximate and are to be used for identification only.

PART – A:

QUESTION NO.1 IS COMPULSORY. ATTEMPT ANY 2 QUESTIONS FROM THE REMAINING:

(30 MARKS EACH)

Q.1 A vessel dropped pilot at 51° 44.5' N, 007° 14.5'W. Her maximum draft is 13 meters and is bound for NE lane of St. Georges Channel TSS.

Max engine speed is 13 kts. Visibility is 10 miles. Vessel is equipped with all functioning bridge equipment. Plan a safe passage. **(30 Marks)**

Q.2 A vessel observes the following compass bearings:-

Ballycotton is Lt.	(51° 49.5'N 007° 59.0'W)	……………………	294^O(C)
Capel Island	(51° 52.8'N 007° 51.2'W)	……………………	338^O(C)
Ram Head	(51° 56.3'N 007° 42.4'W)	…………………..	008^O(C)

Find the position of the vessel and compass error. **(30 Marks)**

Q.3 A vessel steering 056° (G), observes Old Head of Kinsale Lt. Ho. (51° 36.3'N 008° 31.8'W), (Fl (2) 10s 72m 25M) to bear 001° (G) at 1000 hrs. At 1030 hrs it bore 313^O(G) and at 1100 hrs it bore 271^O(G). Current setting west, Gyro Error 1^O(H), Engine speed 10 kts.

Find (a) CMG, SMG (b) Rate of Current (c) Position at 1100 hrs. **(30 Marks)**

Q.4 At 1800 hrs, while steering 251^O(G), Conningbeg Racon M (52° 02.4'N, 006° 39.4'W) was observed 10' off. At 1900 hrs Hook Head Racon K (52° 07.4'N, 006° 55.8'W) bore 051^O(G), Current was known to be setting S'ly at 2 knots. Find (a) Position at 1800 and 1900 hrs. Gyro Error 1^O(H).

(30 Marks)

ALL QUESTIONS ARE COMPULSORY

Q.5 On 13th January Noon a Lt. House in position 50° 25.5'S, 179° 59.5'W, bore 004° T, Distance 16 miles. From the following log abstract find the course and distance made good and EP on 14th January noon:-

		Comp Co.	Dev	Var	Wind	Leeway	Log
13th Jan Noon	Set Co.	225°	3°W	3°E	Sly	2^O	00
2000hrs	A/Co	162°	Nil	3°E	Sly	3°	100
0200 hrs	A/Co	070°	2^{O}W	4°E	Ely	2^O	160
0800 hrs	A/Co	120°	2^{O}E	4°E	Ely	Nil	220
14th Jan Noon	A/Co	130°	3°E	4°E	Ely	2^O	270

A S W: current at 2 Kts was experienced throughout, clocks were advanced 1 hrs at midnight and vessel had engine breakdown from 0430 hrs to 0500 hrs. **(30 Marks)**

Q.6 Find GC distance, initial course and final course between A: 45° 00'N 165° 00'E to B: 10°00'S, 150° 00'W. **(30 Marks)**

Q.7 Find the High + Low water at Richmond (#2821) on 29th March 1992. **(30 Marks)**

Q.8 Draw the following symbols in your answer sheet:-

a) Fairway buoy   b) East Cardinal Mark   c) North Cardinal Mark

d) Wreck depth unknown and dangerous to surface navigation, and

e) Submarine Power Cable.

(20 Marks)

**************************x***x***************************

GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

<u>Notes</u>:

1. Use Chart **5056** (START POINT TO THE NEEDLES), Deviation card No.2, Variation 6.1^{O}W, HE 12 m, Engine speed 8 knots.

2. Luminous range diagram may be provided if necessary.

3. Use Admiralty Tide Tables for 1992.

4. Position of land marks are approximate and are to be used for identification only.

PART – A:

QUESTION NO.1 IS COMPULSORY. ATTEMPT ANY 2 QUESTIONS FROM THE REMAINING:

(30 MARKS EACH)

Q.1 Explain in detail the purpose and principles of passage planning. Plan a safe passage with clear marking of courses and distances, alteration points for each leg of passage from straight point pilot station. (50° 36.5'N, 003° 21.7'W) to Needles Channel pilot station. Draft is 12m and all modern navigational equipments are available onboard. **(30 Marks)**

Q.2 A vessel steering 200°C observed Berry Head Light (50° 24'N, 003° 29'W) bearing 277°C at 1800hrs. At 1845 hrs same light was bearing 320°C and at 1915 hrs it bore 335°C. Also at 1915 hrs Start Point light (50° 13'N, 003° 38.5'W) was bearing 249°C. Find the position at 1915 hrs and course and speed made good from 1800 hrs to 1915 hrs. Also find set and drift experienced during above mentioned times. **(30 Marks)**

Q.3 At 2130 hrs, in DR position 50° 04'N, 002° 00'W, the vessel observed star "X" with azimuth 160°T, intercept 2.5 miles away and star "Y" with azimuth 085°T, intercept 2 mile towards. Find the vessel's position at 2130 hrs and course to steer to sight Bill of Portland light right ahead, when 8 miles off, if the current was setting 300°T at 3 knots. Also, find the course and speed made good. **(30 Marks)**

Q.4 Following radar observations were made on a vessel at 2100 hrs, Straight Pt. (50° 36.5'N, 003° 21.7'W) was at a range of 7 miles. At 2145 hrs Beer Head (50° 41'N, 003° 05.7'W) was at the range of 5 miles. If the course steered by the vessel was 077°T and the current was known to be setting NW at 2 knots. Wind is blowing southerly making a leeway of 2^{O}. Find the course made good by the vessel and her position at 2145 hrs. **(30 Marks)**

PART B:

ALL QUESTIONS ARE COMPULSORY

Q.5 Following courses and distances were steamed by a vessel doing 15 knots, between noon of 15th Jan till noon of 16th Jan. The noon position on 15th Jan was observed to be 10°S 45°E.

Ship's Time	Compass Course (deg).	Variation (deg) E/W	Deviation (deg) E/W
1200 – 1800	150	2^{O}E	3°E
1800 – 2400	135	2^{O}E	5°W
0000 – 0600	090	2^{O}E	6°E
0600 – 1200	120	2^{O}E	3°W

Calculate the expected noon position for 16th January. **(30 Marks)**

Q.6 Calculate the Great Circle distance, initial & final course between 20° 00'S, 005° 00'W and 10° 00'N, 050° 00'W. **(30 Marks)**

Q.7 Calculate the height of tide at Sikka (ATT Vol 2 # 4333a) for 14th Feb 1992. **(30 Marks)**

Q.8 Draw following symbols as used on BA charts
a) Fairway buoy   b) South Cardinal mark   c) Dangerous Wreck
d) Submarine Cable   e) Isolated danger mark

(20 Marks)

*************************X***X****************************

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours	PASS MARKS: 140	MAX. MARKS: 200

Notes:

1. Use Chart **5048** (Ireland – South coast), Deviation card No. 2, HE 12 m, Variation 0.5^{O}E.
2. Luminous range diagram may be provided if necessary.
3. Use Admiralty Tide Tables for 1992.
4. Position of land marks are approximate and are to be used for identification only.

PART – A:

QUESTION NO.1 IS COMPULSORY. ATTEMPT ANY 2 QUESTIONS FROM THE REMAINING

(30 MARKS EACH)

Q.1 A vessel dropped pilot at 51° 44.5'N, 007° 14.5' W. Her maximum draft is 13 meters and is bound for NE lane of St. Georges Channel TSS.

Max engine speed is 13 kts. Visibility is 10 miles. Vessel is equipped with all functioning bridge equipment. Plan a safe passage.

Q.2 While steering 102^{O}(G) error 1^{O}(H), Old Head of Kinsale Lt. (51° 36.3'N, 008° 31.8'W, Fl (2) 10s 72m 25M) was observed to be 5 miles off in Starboard quarter. Echosounder indicated a depth of 45m. After steaming for an hour and experience S'ly current at 2ks with engine speed of 15kts Kinsale B West Lt. (051° 21.6'N, 008° 01'W) bore 181^{O}(G). Determine the initial and final position of the vessel.

Q.3 A vessel steering 056° (G), observes Old Head of Kinsale Lt. Ho. (51° 36.3'N, 008° 31.8'W), [FL (2) 10s 72m 25M] to bear 001° (G) at 1000 hrs. At 1030 hrs it bore 313^{O}(G) and at 1100 Hrs it bore 271^{O}(G). Current setting west, Gyro error 1^{O}(H), Engine speed 10 kts.

Find (a) CMG, SMG   (b) Rate of current   (c) Position at 1100 hrs.

Q.4 At 1800 Hrs, while steering 251° (G), Coninbeg Racon 'M' (52° 02.4'N, 006° 39.4'W) was observed 10' off. At 1900 hrs Hook Head Racon 'K' (52° 07.4'N, 006° 55.8' W) bore 051° (G). Current was known to be setting S'ly @ 2kts. Determine ship's position at 1800 & 1900 hrs. Gyro error 1^{O}(H).

ALL QUESTIONS ARE COMPULSORY

Q.5 On 13th January Noon a Lt. House in position 50° 25.5'S, 179° 59.5'W, bore 004°T. Distance 16 miles. From the following log abstract find the course and distance made good and EP on 14th January noon:-

		Comp. Co.	Dev	Var	Wind	Leeway	Log
13th Jan Noon	Set Co.	225°	3°W	3°E	Sly	2^O	00
2000 hrs	A/Co.	162°	Nil	3°E	Sly	3°	100
0200 hrs	A/Co.	070°	2^{O}W	4°E	Ely	2^O	160
0800 hrs	A/Co.	120°	2^{O}E	4°E	Ely	Nil	220
14th Jan Noon	A/Co.	130°	3°E	4°E	Ely	2^O	270

A SW x Wly current at 2 Kts was experienced throughout, clocks were advanced 1 hrs at midnight and vessel had engine breakdown from 0430 hrs to 0500 hrs.

Q.6 Calculate the Great Circle distance, initial & final course between 33°45'S, 23°18'E and 20°08'S, 104°06'E.

Q.7 Find the High + Low water at Richmond (#2821) on 29th March 1992.

Q.8 Draw following symbols as used on BA charts

a) Fairway buoy   b) East cardinal mark   c) North Cardinal mark

d) Submarine Power Cable   e) Isolated danger mark

(20 Marks)

****************************x***x****************************

GOVERNMENT OF INDIA

Date: - 8th April-2021

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours	**PASS MARKS: 140**	**MAX. MARKS: 200**

Notes:
1. Use Chart **5047** Deviation card No. 3, Variation 4°E, HE 10 m, Speed 12 knots.
2. Luminous range diagram may be provided if necessary.
3. Use Admiralty Tide Tables for 1992.
4. Position of land marks are approximate and are to be used for identification only.

SECTION – I (30 Marks Each)

QUESTION NO.1 IS COMPULSORY. ATTEMPT ANY 2 QUESTIONS FROM THE REMAINING 3

Q.1 Vessel having a draught of 11m drops pilot at Bristol Pilot Ground (51° 21'N, 003° 19'W) in gale force winds and is bound for Swansea (51° 32'N, 003° 57'W). Vessel is equipped with Radar, Arpa, Echo Sounder and Doppler Log. In view of above plan a safe passage for intended passage.

(30 Marks)

Q.2 a) At 1900 Hrs ship in DR position 51° 20'N, 004° 20'W observing following: Star A, Azimuth 218^O(T) X 2' Towards: Star B, Azimuth 143^O(T) X 1.5 toward. Find the vessel position at 1900 hrs.
b) From 1900 Hrs position vessels intends to reach 5.5' North of Hartland point. Current was setting south at 2 Knot. Find the compass course to steer? **(30 Marks)**

Q.3 At 1400 Hrs a ship observes radar range of Caldey island 51° 37.8'N, 004° 40.6'W is 4 miles. Again at 1500 hrs it was found that radar range of ST. Gowan Light ship (51° 30.5'N, 004° 59.6'W) was 5 miles. During 1400 Hrs to 1500 Hrs interval, ships course was 240^O(T) and speed 8 knot, current was setting 150^O(T) @ 2 knot. Find the vessel position at 1400 Hrs and 1500 Hrs.

(30 Marks)

Q.4 At 1100 Hrs, a vessel Steering 080^O(T), Porteymon Pt. (43)(51°31.5'N, 004°13'W) bore 030^O(T), at 1130 it bore 000^O(T) and at 1200 bore 330^O(T), determine course and speed made good and the rate of current if the current was setting south. **(30 Marks)**

Q.5 On 21st June @ N/N position 20° 15' S, 160° 30'E, from the following the log abstracts find

- Courses & distance made good noon to noon

- Position arrived at noon on 22nd June

Time	Compass Co.	Variation	Deviation	Leeway	Wind	Speed
Noon	313°C	3°E	3°E	3	N	12.5
2000 A/co	027°C	3°E	2^{O}W	3	N	12.3
0200 A/co	075°C	3°E	6°W	Nil	NE	13.1
0800 A/co	123°C	3°E	1^{O}E	3	E	14.0

Current was setting SW @ 2.5 knots throughout. Engine Breakdown from 0400 hrs to 0600 hrs and clocks retarded by 1 HR at Midnight. **(30 Marks)**

Q.6 Find the initial course, final course, distance when sailing on a great circle course from 24° 35'N, 063° 44'E to 40° 21'N, 139° 21'E. **(30 Marks)**

Q.7 A vessel in the port of Duclair (Att Vol 1 # 1588) completes loading cargo on 22nd Feb 1992 at 1200 hours with a maximum draft of 9.2m. She has to cross a bar marked 6m at the entrance of the port with a UKC of 1.5m. Find the earliest time when she can safely cross the bar. **(30 Marks)**

Q.8 Notices to Mariners: No. 384 of 2014 were received for the chart 5047 with the following corrections. Do the necessary correction in the char using correct symbols (use pencil only).

- Wreck dangerous for surface navigation in position 51° 30'N, 004° 42'W

- Insert 'Obstruction' (depth unknown) in position 51° 38'N, 004° 44'W

- Insert 'Isolated Danger Mark' (Lit) in position 51° 37.9'N, 004° 44'W

- Insert 'Submarine gas Pipeline' from 51° 26.3'N, 003° 36.2'W to 51° 14.6'N, 003° 47.0'W.

(20 Marks)

**************************x***x**************************

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours **PASS MARKS: 140** **MAX. MARKS: 200**

Notes:

1. Use Chart **5048** (Ireland – South coast), Deviation Card No.2; HE 12 m; Variation 0.5o E.
2. Luminous range diagram may be provided if necessary.
3. Use Admiralty Tide Tables for 1992.
4. Position of land marks are approximate and are to be used for identification only.

PART – A:

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING:

(30 MARKS EACH)

Q.1 A vessel in SW bound lane in St. George Channel initial waypoint 52° 10'N 006° 05'W. Her Max. draft is 12m and is bound for Cork harbor pilot station 51° 45.6' N 008° 14'W. Max. engine speed 13 kts. Visibility is 8 miles with light rains. Vessel is equipped with all latest navigational aids. Plan a safe passage for above situation indicating courses, distances, waypoints, other required information etc. on the chart and in answer sheet. **(30)**

Q.2 While steering 102^O(G) error 1^O(H), Old Head of Kinsale Lt. (51^O36.3'N 008^O31.8'W: Fl (2) 10s 72m 25M) was observed to be 5 miles off in Startboard quarter. Echosounder indicated a depth of 45m. After steaming for an hour and experiencing S'ly current at 2ks with engine speed of 15kts Kinsale B West Lt. (051^O21.6' N 008^O01'W) bore 181^O(G). Determine the initial and final position of the vessel. **(30)**

Q.3 At 1400 hrs, following compass bearings were observed by the vessel.

➢ Ballycotton Island Lt. (51° 49.5'N, 007° 59'W) 294^O(C)
➢ Capel Island (51° 52.8'N, 007° 51.2'W) 338^O(C)
➢ Ram Head (51° 56.3'N, 007° 42.4'W) 008^O(C)

Determine ship's position and compass error. **(30)**

Q.4 At 1800 hrs, while steering 251^O(G), Coninbeg Racon 'M' (52° 02.4'N, 006° 39.4' W) was observed 10' off. At 1900 hrs Hook Head Racon 'K' (52° 07.4'N, 006° 55.8'W) bore 051^O(G). Current was known to be setting S'ly @ 2 kts. Determine ship's position at 1800 & 1900 hrs, Gyro error 1^O(H). **(30)**

ALL QUESTIONS ARE COMPULSORY

Q.5 Following courses and distances were steamed by a vessel doing 12 knots, between noon of 1st Feb till noon of 2nd Feb. The noon position on 1st Feb was observed to be 15°N 30°W.   **(30)**

Ship's Time	Compass Course (deg)	Variation (deg) E/W	Deviation (deg) E/W
1200 – 1800	175	3°E	2^{O}E
1800 – 2400	133	3°E	6°W
0000 – 0600	090	3°E	3°W
0600 – 1200	061	3°E	4°W

Clocks were advanced for 1 hr at between 0300 hrs. Current setting 240° x 2 kts was experienced throughout. Estimate the noon position arrived on 2nd Feb when above courses were steered and distances steamed.

Q.6 Calculate the Great Circle Distance, initial & final course between 33° 45'S, 23°18'E and 20°08'S, 104°06'E.   **(30)**

Q.7 For port of Antwerp (Vol. 1) on 9th March 1992, determine height of tide at 1541 hrs LT.

(30)

Q.8 Draw following symbols as used on BA charts.
a) Fairway buoy   b) East cardinal mark   c) North Cardinal Mark
d) Submarine Power Cable   e) Isolated Danger Mark   **(20)**

***************************X***X***************************

GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:

1. Use Chart **5056** (Start point to Needles), Deviation Card No.1; HE 12 m; Engine Speed 12 knots if not mentioned in the question; Variation 3.8^O W.

2. **Positions of the landmarks are approximate and are for identification only.**

3. Use luminous range diagram as necessary.

4. Use Admiralty Tide Tables for 1992.

PART – A

QUESTION NO.1 IS COMPULSORY. ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING:

(30 MARKS EACH)

Q.1 Explain in detail the principles of passage planning. State the publications that are used for planning safe passage and their purpose.

Q.2 A Vessel steering 210°C observed Berry Head Light (50° 24'N, 003° 29'W) bearing 274°C at 1900 hrs. At 1930 hrs same light was bearing 318°C and at 1945 hrs it bore 345°C. Also at 1945 hrs Start Point light (50° 13'N, 003° 38.5'W) was bearing 247°C. Find the course and speed made good from 1900 hrs to 1945 hrs. Also find set and drift experienced during above mentioned times.

Q.3 At 2030 hrs, in DR position 50° 00'N, 002° 00'W, the vessel observed star "X" with azimuth 170°T, intercept 2 miles away, and star "Y" with azimuth 075°T, intercept 1 miles towards. Find the vessel's position at 230 hrs, and course to steer to sight Bill of Portland light right ahead, when 9 miles off, if the current was setting 290°T at 3 knots. Also find the course and speed made good.

Q.4 Following radar observations were made on a vessel at 2100 hrs Straight Pt. (50° 36.5'N, 003° 21.7'W) was at a range of 8 miles. At 2130 hrs Beer Fead (50° 41'N, 003° 005.7'W) was at the range of 7 miles. If the course steered by the vessel was 075°T and the current was known to be setting NW at 2 knots. Find the course made good by the vessel and her position at 2130 hrs.

PART – B
ALL QUESTIONS ARE COMPULSORY

Q.5 Following courses and distances were steamed by a vessel doing 15 knots, between noon of 14th March till noon of 15th March. The noon position on 14th March was observed to be 10° N 30° E.

Ship's Time	Compass Course (deg)	Variation (deg) E/W	Deviation (deg) E/W
1200 – 1800	085	3°E	2^{O}E
1800 – 2400	120	3°E	6°W
0000 – 0600	082	3°E	5°E
0600 – 1200	110	3°E	4°W

Calculate the expected noon position for 15th March.

Q.6 Calculate the Great Circle Distance, initial & final course between 10°N 40°E and 30°N 100°E.

Q.7 Calculate the height of tide at Richmond (ATT Vol.2, # 2821) on 29th March 1992.

Q.8 Draw following symbols as used on BA charts.

a) Fairway buoy   b) East cardinal mark   c) North Cardinal Mark

d) Submarine Power Cable   e) Gas Supply pipeline

*************************X***X*****************************

GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use Chart **5047** (BRISTOL CHANNEL), Deviation Card No.2; HE 12 m; Engine Speed 12 knots if not mentioned in the question; Variation 0.5^O E.
2. **Positions of the landmarks are approximate and are for identification only.**
3. Use luminous range diagram as necessary.
4. Use Admiralty Tide Tables for 1992.

PART – A

QUESTION NO.1 IS COMPULSORY. ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING:

(30 MARKS EACH)

Q.1 Your vessel has a maximum draft of 7.5m and is bound from position 51°N 004° 45'W to Port Talbot pilot station. V/L is fitted with all modern navigation aids. Plan a safe passage with clear marking of courses and distances, alteration points for each leg of passage.

Q.2 At 1600 hrs, a vessel steering 220°T, speed 10 kts, observes Caldey Light (51°37'N, 004° 40' W), radar range 4.5M. At 1700 hrs, range of Gowan Light ship (51°30'N, 004°59'W) was 6 miles. Determine the vessels position at 1600 and 1700 hrs, if the current was setting 170° T at 2 knots.

Q.3 At 1100 hrs on a vessel steering 345°T at a speed of 8 knots, Lundy Island light (Gp. Fl (2), 20s) bore 028°T, at 1130 hrs it bore 055°T and at 1230 hrs the same light bore 110°T. Determine:
   a) Course and speed made good,
   b) Rate of current, if the current was known to be setting south-west,
   c) Position of vessel at 1100 hrs and 1230 hrs.

Q.4 At 1900 hrs in DR position 51°30'N, 004°15'W, following celestial observations were made:
Star Spica: Azimuth 220°T, intercept 2 miles (towards)
Star Deneb: Azimuth 140°T, intercept 1 mile (towards),
Determine vessels observed position at 1900 hrs and course to steer to arrive 6 miles north of Hartland point (51°01.5'N, 004°32'W) and her ETA, if the current was setting south at 2.5 knots.

PART – B
ALL QUESTIONS ARE COMPULSORY

Q.5 A vessel's log abstract from 15th Sept noon to 16th Sept noon is as follows:-

Time	T. Co.	Speed
1200 – 1600	120°T	10 knots
1600 – 2000	150°T	11 knots
2000 – 0400	135°T	10.5 knots
0400 – 0800	100°T	12 knots
0800 – 1200	110°T	11.5 knots

If a light house (12°15.0'N 003° 20.0'W) bore 130°T at radar range of 4 miles at 1300 hours on 15th Sept and current was setting south at 3 knots throughout.
Find ship's Position at 1300 on 15th & noon position on 16th Sept.

Q.6 Find initial course, final course and GC distance from 32° 30'N 110° 15'E to 60° 20'N 040° 20'E.

Q.7 Find the earliest time on 3rd January 1992 to safely pass over a bar with charted depth 6m at Bay of Fundy St. John, N. B. (#2864) for a vessel having forward draft 7 m and aft draft 8 m with a UKC of 1m.

Q.8 Perform following corrections as per weekly notice to mariner 46 of 2015, (2412 / 2015) in pencil
a) Insert fairway buoy in Position 51° 36' N 004° 40'W
b) Insert Wreck dangerous for surface navigation in position 51^O30'N 004° 48'W
c) Submarine cable from 51^O24'N 003° 33'W to 51° 14'N 003° 50'W.

(20 marks)

****************************x***x****************************

GOVERNMENT OF INDIA

Date: - 11th November-2020

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   PASS MARKS: 140   MAX. MARKS: 200

Notes:

1. Use Chart **5056** (Start point to needles), Deviation Card No.2; HE 12 m; Engine Speed 12 knots if not mentioned in the question; Variation 6° W.

2. **Positions of the landmarks are approximate and are for identification only.**

3. Use luminous range diagram as necessary.

4. Use Admiralty Tide Tables for 1992.

PART – A

QUESTION NO.1 is compulsory. Attempt any two questions from the remaining three questions of this part. All questions carry 30 marks each in this Part.

Q.1 A vessel is located at 'Tor Bay' off Brixham ($50^O25.4$'N, 003° 30.5'W). She is bound for 'Portland Harbour' (50° 35' N, 002° 26.5' W). She has working radar, echo sounder, VHF and GPS. Plan your passage if Northerly gales and moderate visibility. Write the synopsis in answer sheet in details.

Q.2 In Meteorological Visibility of 5 n.m. a vessel steering 075^O(T) at 13 kts last sights on her port quarter Start point Lt Ho ($50^O13.4$' N, 003° 38.4'W) at 0245 hrs and at 0515 hrs first sights the Bill of Port land Lt ($50^O30.8$'N 002° 27.4'W) on her port bow. If the current is known to be setting 300^O(T) at 2 kts and strong Southerly gale is causing 5° leeway. Determine the a) Ships position at 0245 hrs and 0515 hrs and b) Course Made Good and Speed Made Good.

Q.3 At 1800 hrs while on a course 300^O(T) at 14 kts you have observed from a vessel 'East channel Racon' (49^O59' N, 002° 29'W) and 'Channel Lt Vsl' (49° 54.5' N, 002° 55.4' W) to be same distance away on her radar. Two hours later FR light at the 'Start point' Lt Ho (50° 13.3'N, 003° 38.4'W) becomes visible. If current is known to be setting 250^O(T) at 3 kts. Find Course Made Good, Speed Made Good and her position at 1800 hrs.

Q.4 A vessel was steering 260^O(T) at 15 kts. At 1400 hrs Bill of Portland Lt (50° 30.8'N, 002° 27' W) bore 310^O(T) and at 1440 hrs it bore 000^O(T) and again at 1510 hrs the same light bore 040^O(T). Find the Course Made Good, position of the vessel at 1400 hrs and 1510 hrs and drift of the current if current was known to be setting 050^O(T).

PART – B
ALL QUESTIONS ARE COMPULSORY

Q.5 Following courses and distances were steamed by a vessel doing 15 knots, between noon of 5th Jan till noon of 6th Jan. The noon position on 5th Jan was observed to be 10° S 45° E.

Ship's Time	Compass Course (deg)	Variation (deg) E/W	Deviation (deg) E/W
1200 – 1800	150	3^OE	2^OE
1800 – 2400	135	3^OE	6^OW
0000 – 0600	090	3^OE	5^OE
0600 – 1200	120	3^OE	4^OW

Calculate the expected noon position for 6th Jan.

1

Q.6 Calculate the Great Circle distance, Initial & final course between 20° S 30° W and 40° S 80° W.

Q.7 Calculate the height of tide at Sikka (ATT Vol.2, #4333a) for 14th Feb 1992.

Q.8 Draw following symbols as used on BA charts.
a) Light vessel   b) West Cardinal mark   c) Safe Water Mark
d) Submarine oil pipeline   e) Gas supply pipeline.

(20 marks)

***************************x***x****************************

GOVERNMENT OF INDIA

Date: - 6th October-2020

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use Chart **5047** (BRISTOL CHANNEL), Deviation Card No.1; HE 15 m; Engine Speed 12 knots if not mentioned in the question; Variation 03° E.
2. **Positions of the landmarks are approximate and are for identification only.**
3. Use luminous range diagram as necessary.
4. Use Admiralty Tide Tables for 1992.

PART – A

QUESTION NO.1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING:

(30 MARKS EACH)

Q.1 Your vessel has a maximum draft of 10.0 m and is bound from position 51° N 004° 43' W to Bristol Pilot station V/I is fitted with all modern navigation aids. Plan a safe passage with clear marking of courses and distances, alteration points for each leg of passage. Explain salient features of same.

Q.2 At 1800 hrs, a vessel steering 240°T, speed 12 kts, observes Caldey Light (51° 37' N, 004° 40' W), radar range 5.5M. At 1830 hrs, range of Gowan Light Ship 51° 30'N, 004° 59'W was 5 miles. Determine the vessels position at 1800 and 1930 hrs, if the current was setting 200 T at 3 knots.

Q.3 At 1300 hrs on a vessel steering 170°T at a speed of 7 knots, Lundy Island light (Gp. F1 (2), 20s) bore 210°T, at 1400 hrs it bore 235°T and at 1500 hrs the same light got obscured. Determine:
a) Course and speed made good,
b) Rate of current, if the current was known to be setting west
c) Position of vessel at 1500 hrs.

Q.4 At 2000 hrs in DR position 51° 30'N, 004° 15'W, following celestial observations were made:
Star Spica: Azimuth 220°T, intercept 1 mile (away)
Star Deneb: Azimuth 140°T, intercept Nil.
Determine vessels observed position at 2000 hrs, and course to steer to arrive 4.9 miles north of Foreland point (51° 14.7'N, 003° 47.2'W) and her ETA, if the current was setting south at 3.0 knots. Engine speed 13.3 knots.

PART – B
ALL QUESTIONS ARE COMPULSORY

Q.5 Initial position of the vessel 20° 15'S, 160° 30'E.
From the following log abstract find:
 a) Course and distance made good Noon to Noon
 b) Position arrived at next day Noon

	Compass Course	Var	Dev	Leeway	Wind	Speed
Set/ Co.	313^O(C)	3°E	3°E	2^O	N	12.5 kts
2000 A/C	027^O(C)	4°E	2^{O}E	3°	N	12.3 Kts
0200 A/C	074^O(C)	5°E	7°E	Nil	NE	13.1 Kts
0800 A/C	123^O(C)	6°E	1^{O}E	3°	E	14.0 Kts

Current was setting SW @ 2 knots throughout. There was an engine breakdown from 0400 hrs to 0530 hrs. Clocks were retarded by 1 hour at midnight. **(30 Marks)**

Q.6 Calculate the great circle distance, Initial Course and Vertex from position 56° 45'N 065° 32'E to position 33° 36'N 132° 20'E. **(30 Marks)**

Q.7 A vessel drawing 2m forward and 2.8m aft has to cross a sand bar marked 1m on the chart with an underkeel clearance of 2.5m in the port of Liverpool (ATT-1) on 16th March 1992. Find the earliest time she can cross the same on a rising tide. **(30 Marks)**

Q.8 Correct your chart as per weekly notice 23 of 2016 correction No. 128/ 2016 with following (with pencil) and make appropriate entry. Draw these symbols on answer sheet as well.
a) Insert "Wreck over which depth of 15.3 meters" in 51° 23.8'N, 003°43'W.
b) Insert "Oil Production Platform with flare whose identification is MZ-09 with safety zone of 1NM" in 51° 21.2'N, 004° 51'W.
c) Insert "Oil pipeline from 51° 38.2'N, 004° 47'W to new SBM in position 51°35.3'N, 004°45'W", and
d) Insert "West Cardinal mark Pillar Buoy" in 51° 32.2'N, 004° 52'W.

***************************X****X***************************

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:

1. Use Chart 5048 (Old head of Kinsale to Tuskar Rock), Deviation Card No.1; HE 12 m; Engine Speed 12 knots if not mentioned in the question; Variation to be used as per chart.

2. Positions of the landmarks are approximate and are for identification only.

3. Use luminous range diagram as necessary.

4. Use Admiralty Tide Tables for 1992.

PART – A

QUESTION NO.1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING:

(30 MARKS EACH)

Q.1 A bulk carrier with the maximum draft of 10 m disembarked her pilot at Youghal bay anchorage in position 51° 53.6' N, 007° 51'W. Plan a safe passage from this position to join the north east bound lane of st. Georges channel TSS. Write down the precaution you will take when you make a passage plan on ECDIS?

Q.2 Following bearings of old head KinsaleIt in position $51^O36.2'N, 008^O32'W$, were observed as follows:-

 0900 hrs – 330^O(T)
 0924 hrs – 280^O(T)
 1000 hrs – 025^O(T)

At 1000 hrs balley cotton island lt. in position ($51^O49.9'N, 007^O59'W$) was 10 miles off while vessel was steering a course of 043^O(T) at 12 kts find the followings:-

 a) Course Made Good   b) Speed Made Good   c) Set and Drift

 d) Also find the position at 1012 hrs

Q.3 Tusker rock lt ($52^O12'N, 006^O18'W$) was first seen at a distance of 3.6 miles off and 30 minutes later it was last seen at a distance of 3.6 miles off due to poor visibility, in this interval the vessel steered a course of 235^O(T), current was setting 330^O(T) in 2 kts, determine the position of the vessel at the time of first seen and last seen?

Q.4 A vessel observes balley cotton island lt ($51^O49.9'N, 007^O59'W$) bearing 236^OC, capel island ($51^O52.5'N, 007^O51'W$) bearing 295^OC and Williamson town lt ($51^O56.2'N, 007^O51'W$) bearing 340^OC. Find the ship's position and deviation for ship's head?

PART – B
ALL QUESTIONS ARE COMPULSORY

Q.5 Vessel in DR position $50^O16.0'S$ $145^O13'E$ on 30th July 2000 set course as follows:

Time	Compass Course	Dev	Var	Log
1200	244^OC	1^OW	3^OW	0
1600	194^OC	2^OW	2^OW	60
2000	201^OC	1^OW	0°	122
0400	172^OC	0°	2^OW	181
1200	139^OC	2^OE	1^OW	301

Find ship's noon position on 31st July 2000 if current was setting 260°T at 3 knots. Ship's clocks were retarded by 1 hour at 00:00 hours.

Q.6 Find the Initial course. Final course and position of Vertex between positions 30°N, 060°E to 50°S, 155°E.

Q.7 Find times and heights of H. W and L. W on 10th April 1992 at Navlakhi (Att-2).

Q.8 Draw the following chart symbols:-   **(20 Marks)**
a) Underwater rock of unknown depth, dangerous to surface navigation.
b) Wreck showing any portion of hull or superstructure at level of chart datum.
c) Radio Reporting Point
d) Submarine Cable
e) A Pilot Point

***************************x***x***************************

GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:

1. Use Chart 5047 (Bristol Channel), Deviation Card No.2; HE 12 m; Engine Speed 12 knots if not mentioned in the question; Variation as per chart.

2. Positions of the landmarks are approximate and are for identification only.

3. Use luminous range diagram as necessary.

4. Use Admiralty Tide Tables for 1992.

PART – A

QUESTION NO.1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING:

(30 MARKS EACH)

Q.1 Your ship is a container vessel having all modern bridge equipment and draft of 11m. Plan a safe passage from $51^O02.8'N$, $004^O19'W$ to Bristol Pilot Stn ($51^O20'N$, $003^O18'W$). Weather: Good visibility, Wind NW'ly x force 6.

Q.2 At 1400 hrs Bull Point Lt.. Ho. ($51^O09'N$, $004^O13'W$) was bearing $131^O(T)$ and at 1420 hrs its bore $181^O(T)$ and at 1450 hrs it was bearing $223^O(T)$. During this period ship's course was $082^O(T)$ and speed 12 kts. If current was estimated to set $022^O(T)$, find CMG, drift and position of vessel at 1400 and 1450 hrs.

Q.3 At 1900 hrs Caldey island Lt. Ho. ($51^O37'N$, $004^O42'W$) was 4.1 NM away and after 30 minutes same Lt. Ho. was bearing $322^O(T)$. During this period ship sailed on a course $155^O(T)$ at a speed of 10 kts. Current was estimated to set $170^O(T)$ x 1.5 kts, wind SW'ly x leeway. Find CMG, SMG, position at 1900 and 1930 hrs.

Q.4 While at anchor vessel following compass bearing were observed:

Lundy island South Lt Ho. ($51^O10'N$, $003^O 42'W$)	276^OC
Bull Point Lt. Ho.	071^OC
Hartland Lt. Ho. ($51^O02'N$, $004^O32'W$)	196^OC

PART – B
ALL QUESTIONS ARE COMPULSORY

Q.5 On 13th Jan noon a light house in position $50^O 25.5'S$ $179^O 59.5'W$ bore 004° True distance 16 miles. Ship thereafter steered following courses:

Time		Com. Co.	Dev	Var	Wind	Leeway	Log
13th Jan 1200 Hrs.	S/Co	225°	3^OW	3^OE	Sly	2^O	0
14th Jan 0200 Hrs.	A/Co	070°	2^OW	4^OE	Ely	2^O	160
0800 Hrs	A/Co	120°	2^OE	4^OE	Ely	Nil	220
1200 Hrs	A/Co	155°	1^OE	4^OE	1^OE	2^O	270

SW x Wly current at the rate of 2 kts was experienced throughout. Clocks were advanced by 1 hour at midnight. Find course and distance made good noon to noon and position of ship on 14th Jan Noon.

Q.6 Find the Great Circle distance, initial course and final course between following positions:

From (A) 15° 00.0' S; 012° 00.0' E

To   (B) 07° 00.0' N; 053° 00.0' W

Q.7 Find tidal Predictions for Bharuch (ATT Vol II, #4352) on 19th Feb 1992.

Q.8 Draw chart symbols of the following:-

a) Wreck over which depth is 14.3 m.

b) Rock whose drying height is 1.4 meters.

c) Suspended well over which depth is 16.5 meters.

d) Rock which covers and un-covers, height above chart datum unknown.

e) Disused Submarine power cable.

f) Yellow spherical buoy flashing 5 flashes every 20 seconds.

g) Tide Rips.

***************************X***X***************************

GOVERNMENT OF INDIA

Date: - 6th November-2019

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:

1. Use Chart 5072 (Falsterbo to Oland), Deviation Card No.2; HE 8 m; Engine Speed 12 knots if not mentioned in the question; Variation 3° W.

2. Positions of the landmarks are approximate and are for identification only.

3. Use luminous range diagram as necessary.

4. Use Admiralty Tide Tables for 1992.

PART – A

QUESTION NO.1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING:

(30 MARKS EACH)

Q.1 Plan a safe passage from Kullagrund (55°17'N 013°20'E) Pilot station to 56° 05'N 016° 15'E. Your vessel is a VLCC, having a draft of 18.5 meters, with normal service speed 15 kts and fitted with all latest navigational equipment as per SOLAS. Weather: Winds NE'ly x Force 6, Visibility about 3 nm.

Q.2 A vessel steering 185^O(T) observed following bearings of Christianso South Lt. Ho. (55° 19'N 015° 11'E): 1900 hrs: 222^O(T), 1925 hrs: 260^O(T) and 2015: 321^O(T). If current was estimated to set 125^O(T) x 2 kts, find CMG, engine speed and position at 1900 hrs and 2015 hrs.

Q.3 a) At 1300 hrs Utklippan Lt. Ho (55° 57'N 015° 44'E was bearing 031^O(T) and distance by radar 5 NM. From 1300 hrs find true course to steer to pass Hammeroddde Lt. ho (55° 18'N 015°03'E) by 4 NM on port side. Current was estimated to set 095^O(T) X 3 kts, wind E'ly X leeway 4°. Ship's Engine speed 14 Kts.

b) If vessel continued as per part (a) find time, and true bearing when Hammerodde Lt. Ho will be raised.

Q.4 On a vessel at anchor following gyro bearings were observed at 2330 hrs:-

    i) Hano ls Major Lt. (56° 01'N 014° 50'E)   250^O(G)

    ii) Tarno ls Lt. Ho. (56° 08'N 014° 58'E)   315^O(G) and

    iii) Gasefetan Lt. (56° 09'N, 015° 13'E)   045^O(G).

Find ships position & Gyro error.

PART – B
ALL QUESTIONS ARE COMPULSORY

Q.5 8th August at Noon Cape Sorell (42° 11'S 145° 10'E) bore 070°C distance 10 miles, Ship's head 292°C. From Noon, courses steered by the vessel are given in the following table:

SMT	Compass Course	Log	Wind Direction	Leeway	Deviation	Remarks
1200	292°	0	SW	3°	3°E	
1700	290°	32	SW x S	2^O	3°E	
2100	287°	62	SSW	2^O	2^{O}E	Variation 8°E Current
2100 – 2400	Vessel stopped for M/E Repair work. At 2400 hr resumed passage. Course 287°					Set direction 178^O(T) throughout.
0100	285°	90	SSW	NIL	1^{O}E	Drift 10 NM.
0900	279°	138	SSW	3°	1^{O}E	
1200	279°	138	SSW	3°	-	

Find the EP next noon. CMG & SMG by the vessel from 8th Noon to 9th Noon?

Q.6 Find the Great Circle distance and final course by Great Circle sailing from position 'A' in Lat 20° 00'S Long 165°00'W to a position 'B' in Lat 35°N Long 155°E?

Q.7 Find the earliest time on 11th March 1992 when a vessel can enter waters off Broom (ATT 6265) having a draft of 20 meters and the patch at the entrance has a charted depth of 15 meters and the vessel needs a UKC of 2.0 meters.

Q.8 Draw following chart symbols and write your reaction in case the ship's track was laid over them:
a. Radio Callin-in Point for SW direction of vessel movement.
b. Major Light Float.
c. Wreck over which depth is 14.2 meters.
d. Yellow Pillar Buoy fitted with Radar Transponder Beacon transmitting Morse code "D".
e. Dangerous under water rock over which depth is 4.2 meters.

****************************X***X****************************

Date: - 3rd Sept-2019 (Noida Batch P.M. Paper)

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:

1. Use Chart 5048 (Old head of Kinsale to Tuskar Rock), Deviation Card No. 2; HE 12m ; Engine Speed 12 knots if not mentioned in the question: Variation as per chart.

2. Positions of the landmarks are approximate and are for identification only.

3. Use luminous range diagram as necessary.

4. Use Admiralty Tide Tables for 1992.

PART – A

QUESTION NO.1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING:

(30 MARKS EACH)

Q.1 Plan a safe passage from Cork Harbour Pilot stn (51°45'N, 008° 15'W) to a position 52°08'N, 006°45'W. Your ship is VLCC with draft of 19.5m and fitted with latest bridge equipment.

Q.2 Following bearings of Mine Head Lt ho (52° 00'N, 007°35'W) were observed: 1900 hrs: 271^O(T), 1925 hrs: 314^O(T) and 2005hrs: 005^O(T). At 2005 hrs Ram Head Pt. (51°55'N, 007°43'W) was bearing 335^O(T). During above period ship steered a course of 222^O(T) at speed of 9 kts. Find course made good, set & drift and position at 2005 hrs.

Q.3 While steering a course of 062^O(T) x 14 kts, at 2100 hrs Bally cotton Lt. Ho. (51°50'N, 007°59'W) was first sighted and at 2140 hrs it was last sighted. During this period current was estimated to set 290^O(T) x 4 kts. Meteorological visibility 3 NM. Find Course Made Good, Speed Made Good and Positions at 2100 hrs and 2140 hrs.

Q.4 On a vessel at 0500 hrs Pilot Lookout Lt. Ho (52°09'N. 007°00'W) and Hood Head Lt. Ho (52°07'N, 006°56'W) were in transit bearing 302^O(G) and after 45 minutes Hook Head Lt. Ho was bearing 048^O(G). During this period vessel sailed on course of 265^O(G) at speed of 11 kts, current was estimated to set 210^O(T) x 4 kts. a) Find the gyro error   b) Find position at 0500 hrs, course made good and speed made good.

PART – B

ALL QUESTIONS ARE COMPULSORY

Q.5 On 1st April noon a vessel in position 30° 30'N 070° 45'E steamed following courses:

1200 hr course was 300°T, next alteration was at 1900 hrs to 010^O(T), Engine break down took place between 2000 hrs to 2100 hrs, vessel resumed her course of 010^O(T) again. Next alteration was at 0500 hrs to 045°T. Current was setting throughout NE @ 3 kts and clocks were retarded by 01 hour at midnight. Find – a) Course and distance made good noon to noon, b) position arrived at next day noon. (Engine speed was throughout 12 kts).

Q.6 A vessel sailed on initial G.C. course 210°T from position 38°30'S, 025° 30'W for a distance of 1000 NM. Find latitude and longitude arrived and final course.

Q.7 Given height of Bridge is 50M. MHWS range is 4M and chartered depth is 10M. Find earliest time a vessel with 12M draft can sail out from Bombay on 05th March 1992 to pass safely with minimum 1M clearance under the bridge and what will be her UKC. Maximum height of vessel from Keel to top of Mast is given as 62M.

Q.8 Draw following Symbols as used on BA charts:

a) Safely Fairway buoy   b) West Cardinal mark   c) Sounding of doubtful depth

d) Submarine Pipeline   e) Radio reporting point (both ways)

***************************X***X****************************

GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:

1. Use Chart 5047 (Bristol Channel), Deviation Card No.2; HE 10m; Engine Speed 12 knots if not mentioned in the question; Variation as per chart.
2. Positions of the landmarks are approximate and are for identification only.
3. Use luminous range diagram as necessary.
4. Use Admiralty Tide Tables for 1992.

PART – A

QUESTION NO.1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING:

(30 MARKS EACH)

Q.1 Your ship is a container vessel having all modern bridge equipment with draft of 10m. Plan a safe passage from 51° 03.2'N 004° 35.4'W to reach Bristol pilot station (51° 20'N 003° 18'W).

Q.2 At 0530hrs for a vessel in DR 51^O20.0'N 004° 15.0'W the Mambles Hd Lt (51^O33.8'N 003° 58.2'W) bore 055^OT, at the same time sight of STAR VEGA gave an intercept of 5' and an azimuth of 230° away. Find ship's position at 0530 hours.

From this position find True course to steer so as to pass 3 miles off south of Helwick light vessel (51° 30.4'N 004° 25.8'W) if prevailing current was setting 170^OT at 3 knots and S'ly wind causing 3° leeway.

Q.3 For a vessel sailing, St Gowan Lt Vessel (51° 30.5'N 004° 59.5'W) bore 235^OT at 2000 hrs. Same light vessel bore 270° after 30 minutes. Again at 2115 hrs same light vessel was observed at 310^OT. At 2030 hrs caldey island lt bore 036^OT.

Find Course Made Good, Speed Made Good and Course steered if current was setting 135^OT at 2 knots (Engine speed unknown).

Q.4 A vessel heading 002^OT x 10 kts, observes north Lundy lt (51° 12'N 004° 40.6'W) 060^OT at 2100hrs and the same light bore 150^OT after 30 minutes.

If current was setting NE at 6.4 knots and W'ly wind causing a leeway of 3°.

Find Course Made Good, Speed Made Good & Time when Helwick light (51^O30'N 004^O26'W) will be abeam.

PART – B
ALL QUESTIONS ARE COMPULSORY

Q.5 From following log abstracts find the course and distance made good noon to noon and EP on 14th Noon if observed position on 13th Noon is 40° 25'N 070° 38'E:-

Time	Remark	Com. Co.	Dev	Var	Wind	Leeway	Log
13th 1200	Set Co	220	2W	3E	Sly	2	00
2000 Hrs	A/C	160	1E	3E	Sly	3	100
14th 0800 Hrs	A/C	122	2E	4E	Ely	Nil	210
1200 Hrs	A/C	130	3E	4E	Ely	2	260

A SW'ly current @ 2kts was experienced throughout. Clocks were advanced 1 hrs at midnight. Ship had engine breakdown from 0200 hrs to 0300 hrs on 14th.

Q.6 Find initial course, final course and position of Vertex between Cape Bird 77°08'S 166°30'E and San Francisco 37°49'N 122°25'W.

Q.7 Find daily tidal predictions on 19th Feb 1992 at Port Duclair (Att Vol 1, #1588).

Q.8 i. Draw chart symbols of the following:-
a. Wreck which cleared by wire sweep to depth is 15.3 meters.
b. Production platform showing flare.
c. Suspended well over which depth is 19.6 meters.
d. Rock which dries at level of chart datum.
e. Sw'ly 3 kts Flood tide.

ii. Write section-wise brief contents of weekly notices to mariners.

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GOVERNMENT OF INDIA

Date: - 10th July-2019

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:

1. Use Chart 5056 (Start point to Needles), Deviation Card No.4; HE 12m; Engine Speed 12 knots if not mentioned in the question; Variation as per chart.
2. Positions of the landmarks are approximate and are for identification only.
3. Use luminous range diagram as necessary.
4. Use Admiralty Tide Tables for 1992.

PART – A

QUESTION NO.1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING:

(30 MARKS EACH)

Q.1 A vessel drawing a draft of 16m drops pilot at Needles channel (50° 38' N 1^O 39'W) in gale force winds and is bound for Tor Bay (50° 25'N, 30° 28'W). The vessel is also experiencing steering problem on account of a damaged rudder stock. The vessel is equipped with the following:

   1. Radar with ARPA.   2. Echo Sounder
   3. Rate of turn indicator   4. Doppler Log.

Plan a safe passage.

Q.2 While steering a course of 276^O(G), engine speed unknown, following bearings of Bill of Portland Lt. Ho (50° 31.0'N 002° 27'W) were observed – at 1300 hrs 327^O(G), 1330 hrs 032^O(G) and at 1350 hrs 067^O(G). If Gyro Error was 2^O Low and current was setting 025° (T) at 4 Kts. Find Course made good, engine speed and position at 1300 and 1350 hours.

Q.3 At 1400 hrs a vessel observes East Channel Lt. (49° 59'N 002° 29'W) bearing South and at the same time Channel Lt. vessel bore WSW. Find Ship's position. From this position set a course to pass 4' north of channel Lt. vessel if current was setting 200° T at 2.5 Kts and NW wind was causing a leeway of 3°. Find True course to steer and time when Channel Lt. will be abeam.

Q.4 At 2000 hrs Start point Lt. was 6' off and at 2100 hrs Berry Head Lt. was 5' off on Radar. During the above period, vessel steered a course of 020^OT at 11 kts in a northerly wind causing a leeway of 5°. The current was setting 180^OT at 2 kts. Find CMG, SMG, Position of vessel at 2000 & 2100 hrs.

PART – B
ALL QUESTIONS ARE COMPULSORY

Q.5 Following courses and distances were steamed by a vessel doing 15 knots, between noon of 14th March till noon of 15th March. The noon position on 14th March was observed to be 10^ON 30^OE.

Ship's Time	Compass Course (deg)	Variation (deg) E/W	Deviation (deg) F/W
1200 – 1800	085	3^OE	2^OE
1800 – 2400	120	3^OE	6^OW
0000 – 0600	082	3^OE	5^OE
0600 – 1200	110	3^OE	4^OW

Calculate the expected noon position for 15th March?

Q.6 Calculate the Great Circle distance, initial & final course between 10^ON 40^OE and 30^ON 100^OE.

Q.7 Calculate the height of tide at Richmond (Att Vol.2 #2821) on 29th March 1992.

Q.8 Draw following symbols as used on BA charts   (20 marks)
a) Fairway buoy   b) East cardinal mark   c) North Cardinal mark
d) Submarine Power Cable   e) Gas supply pipeline

**************************X***X****************************

GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:

1. Use Chart 5072 (Falsterbo to Oland), Deviation Card No.2; HE 12m; Engine Speed 14 knots if not mentioned in the question; Variation 4° E.
2. Positions of the landmarks are approximate and are for identification only.
3. Use luminous range diagram as necessary.
4. Use Admiralty Tide Tables for 1992.

PART – A

QUESTION NO.1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING:

(30 MARKS EACH)

Q.1 Your vessel a Tanker just dropped pilot off Savaneke (55° 08.5'N, 015° 11.5' E), plan a safe passage from this position to join west bound traffic lane (TSS) off Falsterbore (55° 18.5' N, 12° 40'E) in a restricted visibility condition. Plot courses on chart and mark alteration points, way points, courses and distances on each leg of passage and same to be written in the answer sheet. Maximum draft 18 mtr. Assume all navigational equipments are working well.

Q.2 At 0800 hrs a vessel was equidistant from Hammerodde (55° 18' N, 014° 47' E) and Christianso Lt (55° 19.3' N, 015° 11.5'E) houses. She was steering a course 325^O(T) at 12 kts, current was estimated to set SW'ly at 2 kts. At 09300 hrs Stensuvud Lt Ho bore 300^0(T). Find the position of the vessel at 0800 hrs and 0930 hrs.

Q.3 While steering a course 228^O(T) Olands sodra Grund Racon light (56° 04' N, 016° 42' E) was last sighted at 2100 hrs, when visibility was 5 n.m. At 2200 hrs Utklippan Lt (55° 57' N, 015° 41' E) was first sighted, visibility remaining same. Current was known to be setting 013^O(T) at 2.5 kts throughout. Find the vessel's position at 2100 hrs and 2200 hrs. Also find time and position when Utklippan light will be last sighted, if visibility remain same. Eng. spd – 12 kts, HE 12m.

Q.4 At 2000 hrs, a vessel drops pilot at Simrishamn Pilot Station (55° 33.5' N, 014° 24'E) and steers a course of 071^O(T) at 9 kts with Meteorological visibility being 5 n.m. Master decides to alter course when Simrishamn Lt (Iso WRG 6s) is last seen. After altering course she is to pass Hano Lt (56° 01' N, 014° 51'E) 3 n.m. on her port side. If current was setting 120^O(T) at 2 kts, find the time and position when (i) Vessel alters course towards Hano Lt. (ii) Hano light is first sighted H.E:- 12m.

PART – B
ALL QUESTIONS ARE COMPULSORY

Q.5 Having reset the log to zero, a ship steered the following courses from noon on 25th June 1992.

Duration	Course	Total Dist.
1200 – 1900	162^O(T)	84
1900 – 2400	122^O(T)	144
0000 – 0600	087^O(T)	220
0600 – 1200	350^O(T)	300

At 1730 hrs a point of land in 42°05'S 118°28'E was observed to be 4 points on the port bow. At 1810 hrs the point was a beam. Find the Course and Distance Made Good and DR position at noon 26th. (30 Marks)

Q.6 Find the initial Course and final Course, the distance along GC track from 25°15'N 045° 12'E to 10° 40'N 130° 20'E. (30 Marks)

Q.7 Find out the height of tide at Suez at 1100 h GMT on 28th April. (30 Marks)

Q.8 Draw the symbols: (20 Marks)
     a) Insert wreck mast visible
     b) Insert south cardinal buoy
     c) Submarine power cable.
     d) Tide rips
     e) Leading Lights.

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GOVERNMENT OF INDIA

Date: - 6th March-2019

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use Chart 5047 (Bristol Channel), Deviation Card No.2; HE 12m; Engine Speed 12 knots if not mentioned in the question; Variation 4°E.
2. Positions of the landmarks are approximate and are for identification only.
3. Use luminous range diagram as necessary.
4. Use Admiralty Tide Tables for 1992.

PART – A

Note: QUESTION NO. 1 is compulsory. Attempt any two questions from the remaining three questions of this part. All questions carry 30 marks in this Part.

Q.1 A vessel having draft of 11m drops pilot at Bristol Pilot Grounds (51° 21'N, 003° 19'W) in gale force winds and is bound for Swansea (51° 32' N, 003° 57' W) while the vessel is equipped with ARPA, Echo sounder, Doppler Log. She is also experiencing steering problems. In view of the above, plan a safe passage for the intended voyage.

Q.2 A ship steered 020^O(T) at 12kts. Following bearings were obtained on North Lundy Light (Lat 51° 12.5'N, Long 064° 40'W), 2100 hrs:- 083^O(T), 2130hrs 121^O(T), 2148 hrs 139^O(T). At 2130 hrs same light house was 8.4 n.m off. If the current remained same throughout, find the Course to steer and engine speed required to reach Port Talbot Pilot station (51°29'N; 004° 00'W) at 0100 hrs next day.

Q.3 At 0800 hrs a vessel observes Foreland point Lt Ho (51° 14.5'N, 003° 47'W) to bear 157° (G) and 5 n.m. off by radar. At the same time Nash Pt Lt Ho (51° 24'N, 003° 33' W) was observed to be 12 n.m. off by radar. From the above position set Gyro course to first sight Helwick Lt. Vessel (51° 30.5' N, 004° 26'W) 30° on STBD bow in prevailing meteorological visibility of 2 miles.

Q.4 At 0600 hrs, a vessel anchored at Carmarthen Bay observes the following:
Watch tower (51° 42'N, 004° 20' W) ……………………………………… 045° (C)
Rhossili Down Tr (189) (51° 35'N, 004° 17' W) ……………………………… 118° (C)
Helwick Lt. Vessel (51° 31'N, 004° 25' W) …………………………………… 180° (C)
Find the   a) Compass Error,   b) Position of the vessel

PART – B
ALL QUESTIONS ARE COMPULSORY

Q.5 From the following Log abstract Find:-
a) CMG, DMG noon to noon, b) position arrived at next Noon.
On 20th January Noon Position Lat:- 20° 30'N, Long:- 040° 20'E

Time	Comp Co	Var^n	Dev^n	L'way	Wind	Log
1200 Set Co	283°	3°E	5°W	3°	NE	000
2100 A/C	044°	4°E	2^{O}E	2^O	N	111
0100 A/C	067°	5°E	4°E	4°	N	149
0800 A/C	340°	5°E	2^{O}W	1^O	N	206
21st N/N						256

Current was setting SE ly @ 2 kts throughout. Clocks were advanced by 1 Hour at midnight.   (30 Marks)

Q.6 Calculate the Initial course, final course and distance along the GC track from position 'A' 35° 40'N, 141° 00' E to position 'B' 45° N 174° 51.8W. (30 Marks)

Q.7 Find the height of tide at 1200 GMT at Gentbrugge (TT 1) (#1539a) on 6th day of March 1992.

(30 Marks)

Q.8 Draw the following chart symbols: (20 Marks)
   a. Underwater rock of unknown depth, dangers to surface navigation.
   b. Wreck showing any portion of hull or superstructure at level of chart datum.
   c. Radio Reporting Point.
   d. Submarine Cable
   e. A Pilot Point.

*****************************X***X*****************************

GOVERNMENT OF INDIA

Date: - 3rd Jan-2019

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours	PASS MARKS: 140	MAX. MARKS: 200

Notes:

1. Use Chart 5056 (Start point to the Needles), Deviation card No.2; HE 12m, Engine speed 12 knots if not mentioned in the question. Variation as per chart.

2. Positions of the landmarks are approximate and are for identification only.

3. Use luminous range diagram as necessary.

4. Use Admiralty Tide Tables for 1992.

PART – A

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY 2 QUESTIONS FROM THE REMAINING: (30 MARKS EACH)

Q.1 You are on a Car Carrier which is having all modern bridge equipment with maximum sea speed of 16 kts and draft of 10m. Plan a safe passage from Needles Channel Pilot station (50° 38'N, 001° 39'W) to Exmouth Pilot Station off Straight Point (50°36'N, 003°22'W). Weather: Good visibility, Wind NE'ly x Wind force 7. Estimated Tidal Stream: NW'ly X 2 kts.

Q.2 While steering a course of 051^O(T) at a speed of 14 kts, following bearings of Start point Lt Ho. (50°13'N, 003°38'W) were observed: 1030 hrs.: 354^O(T), 1100 hrs: 307^O(T) and 1140 hrs 264^O(T). If current was known to set at 3 kts in NE quadrant. Find course made good, speed made good, exact direction of current and position at 1140 hrs.

Q.3 A vessel was steering a course of 160^O(G) at engine speed of 9 kts. At 1100 hrs Bill of Portland Lt. Ho. (50°30'N, 002°27'W) was bearing 120^O(G) and after 45 minutes it was bearing 058^O(G). If current was known to set 195^O(T) at 4 kts, wind NE'ly causing leeway of 3°. Find CMG, SMG and position at 1100 hrs and 1145 hrs. Also find estimated position arrived at 1300 hrs in case vessel continued in same conditions. GE 1^O(H).

Q.4 At 2200 hrs following radar bearings were observed:

Brownsea Is Occ WRG Lt Ho (50°41'N, 001°57'W)	281^O(C)
Hengistbury head (50°42'N, 001°45'W) 031^O(C)	
Needles Point Lt Ho (50°40'N, 001°35'W) 081^O(C)	

Find ship's position & Deviation of compass (Variation 6°W)

PART - B
ALL QUESTIONS ARE COMPULSORY

Q.5 On 1st May at noon a ship in observed position 05°54' S 006° 06.8' W steered following courses till 2nd May noon.

Time	Com. Co.	Dev	Var	Wind	Leeway	Log
1200 Hrs S/Co	160°	2^{O}E	5°W	Sly	1^O	0
2000 Hrs A/Co	247°	4°W	5°W	Sly	4	110
0400 Hrs A/Co	224°	3°W	4°W	Sly	2^O	210
1200 Hrs A/Co	283°	5°W	4°W	Sly	Nil	305

A NNW'ly current was setting at the rate of 2 kts. Throughout, clocks were advanced by 1 hour midnight and engines stopped for repairs between 0430 Hrs. to 0515 Hrs on 2nd May.

Find course and distance made good and position of ship at noon on 2nd May.

Q.6 Find great initial course, final course and position of vertex between departure position (A) 37° 00'S 019° 00'E and arrival position (B) 56° 00'S 067° 00'W.

Q.7 Find tidal Predictions for Filder's Ferry Wharf (ATT Vol 1, #456a) on 13th Feb 1992.

Q.8 Carry out following corrections (weekly notice 10/2017) **with pencil** on your chart:

a. Notice no 103/2017: Insert new wreck showing part of hull in position 50°37'N, 001°41.4'W.
b. Notice no 112/2017: Insert yellow can buoy named "AZ" in position 50°37.5'N, 002°58.5'W with yellow light flashing twice every 15 seconds.
c. Notice no 321/2017: Insert wreck over which depth is 18.3 meters in position 50°36'N, 003°10.3'W.
d. Notice no. 006/2018: Insert underwater rock over which depth is unknown dangerous for surface navigation in position 50°30.3'N, 002°23.6'W.

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GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:

1. Use Chart 5056 (Start point to the Needles), Deviation card No.2; HE 12m, Engine speed 12 knots if not mentioned in the question.
2. Positions of the landmarks are approximate and are for identification only.
3. Use luminous range diagram as necessary.
4. Use Admiralty Tide Tables for 1992.

PART – A

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY 2 QUESTIONS FROM THE REMAINING: (30 MARKS EACH)

Q.1 You are on board a car carrier drawing 09 m fwd and 11 m aft. Keeping in mind the UKC policy of your company plan a safe passage after dropping Needles Pilot (50° 38'N 001° 39'W) to pick up Ex-mouth pilot (50° 36'N 003° 21.5'W). The vessel is fitted with all modern navigational equipment.

Q.2 While steering a course of 280^O(G), following bearings of Bill of Portland Lt. Ho. (50° 31'N, 002° 27'W) were observed, 1300 hrs, 331^O(G), 1330 hrs; 036^O(G) and 1350 hrs 071^O(G). If Gyro Error was 2^O High, current was estimated to set 025^O(T) at 4 kts.
Find course made good, engine speed and position at 1300 and 1350 hrs.

Q.3 At 2030hrs, in DR position 50° 00'N, 002° 00'W, the vessel observed star "X" with azimuth 170^OT, intercept 2 miles away, and star "Y" with azimuth 075^OT, intercept 1 mile towards. Find the vessel's position at 2030 hrs, and course to steer to sight Bill of Portland light right ahead, when 9 miles off, if the current was setting 290^OT at 3 knots. Also find the course and speed made good.

Q.4 While on course of 021^O(G) at speed of 14 kts, at 1600 hrs Start Pt Lt ho (50^O13'N, 003^O30'W) was bearing 270^O(G) and after 45 minutes Berry Head Lt. Ho (50^O24'N, 003^O29'W) was 6 nm away. During this period current estimated to set 045^O(T) at 3 kts, wind wind S'ly with leeway 2^O. If Gyro Error 2^O(H), find CMG, SMG & position at 1600 and 1645 hrs.

PART - B
ALL QUESTIONS ARE COMPULSORY

Q.5 At noon a light house 34^O10'N, 45^O12'E bore 315° by compass (var 10^OW, dev 8^OW), distance 16m she then steamed the following course till next day noon.

Course by compass	Deviation	Variation	Distance
240°	8^OW	8^OW	50M
260°	7^OW	8^OW	65M
275°	4^OW	9^OW	70M
280°	2^OW	9^OW	90M

Find the DR position next noon, if the observed position was 33^O00'N 040^O00'E, find the set and drift experienced.

(30 Marks)

Q.6 Find the initial Course and final Course, the distance along GC track from $49^O 50'N\ 005^O 15'W$ to $32^O 29'N$ $064^O00'W$. (30 Marks)

Q.7 Find the height of tide at 0900hrs local time at Dover on 3rd March. (30 Marks)

Q.8 Draw the following Chart symbols:
a) Radio Tower
b) Contour lines with spot height 132m
c) Rock Awash at the level of chart datum.
d) Obstruction which has been swept by wire of the depth shown.
e) Sounding in true position.

(20 Marks)

****************************x****x*************************

GOVERNMENT OF INDIA

Date: - 5th Sept-2018

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:

1. Use Chart 5072 (Falsterbo to Oland), Deviation Card No. 2; HE 12 m; Engine Speed 12 knots if not mentioned in the question. Variation 6°W.
2. Positions of the landmarks are approximate and are for identification only.
3. Use luminous range diagram as necessary.
4. Use Admiralty Tide Tables for 1992.

PART – A

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY 2 QUESTIONS FROM THE REMAINING: (30 MARKS EACH)

Q.1 Consider you are on a fully loaded container ship maximum speed 26 kts. Plan your passage from simrishamn pilot station 55°33.5'N 014°24.0'E to kullagrund pilot station 55°17.0'N 013°10.5'E if moderate visibility & strong N'ly winds prevails. Show clearly all the way points on the chart recording their co-ordinates in the answer booklet as well. How long will this passage take?

Q.2 The following bearing was observed:

Christianso Lt (55°19'N 15°11.5'E)	057°C
Svaneke Lt (55°08'N 15°10'E)	167°C
Hammerodde Lt (55°18'N 14°47'E)	284°C

Find the ship's position and the deviation for the ship's head if variation was 6°W.

Q.3 At 0200hrs Christiansolt (55°20'N 15°10'E) bore 204°T 6 miles off by radar. From this position find the compass course to steer as to sight Simrishamn Lt. (55°33.5'N 14°22'E) right a head in meteorological visibility of 5 miles with the current setting 040°T at 4 kts. Also estimate the time when Simrishamn light will be sighted right ahead.

Q.4 A vessel in DR posn 55°46'N 15°40'E took a stellar observation at 0430 hrs, which gave an Azimuth of 300°T intercept 3 miles AWAY. From this available information find the safe course so as to pass 4 miles off Christianso Lt. 55°20'N 15°10'E on the portside. Also find the time of final alternation of course.

PART - B
ALL QUESTIONS ARE COMPULSORY

Q.5 On 23rd September, at Noon a light house in position 25° 50'N, 126° 30' E, bore 000° (C), dev 2^O E, Var 6°W, distance 10 n.m. The vessel then steered the following courses:

TIME	COMP CO	VAR^N	DEV^N	LOG
1200	190°	6°W	2^{O}E	000
2000	ENGINES STOPPED TILL 2030 HRS			080 (LOG HAULED)
2030	185°	5°W	NIL	RESET TO 000 (ZERO)
24TH 1200				

Calculate the NOON position on the 24th if current was setting 300^O(T) at 1.5kts throughout.

(30 Marks)

Q.6 Find the initial Course and final Course, the distance along GC track from 25°15'N 045°12'E to 10°40'N 130°20'E.   (30 Marks)

Q.7 Find the depth of water at 0500 hrs on 21st February 1992 at Seattle (A.T.T No.9174). Where the charted depth is given as "dries 0$_5$mtrs". (30 Marks)

Q.8 (a) Write short notes on:-
i) Wind Rose   ii) Hydrographic Note   (10 Marks)
b) Draw the below mentioned chart symbols:-   (10 Marks)
i) Rock awash   ii) Reporting points   iii) Eddies   iv) Foul ground
v) Un-surveyed wreck over which depth unknown but considered to be safe clearance 9m.

***************************X***X****************************

GOVERNMENT OF INDIA

Date: - 3rd July-2018

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use Chart **5048** (Old head of Kinsale to Tuskar Rock), Deviation Card No. 2; HE 12 m; Engine Speed 12 knots if not mentioned in the question. Variation 1^OW.
2. **Positions of the landmarks are approximate and are for identification only.**
3. Use luminous range diagram as necessary.
4. Use Admiralty Tide Tables for 1992.

PART – A

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY 2 QUESTIONS FROM THE REMAINING: (30 MARKS EACH)

Q.1 A Vessel dropped a pilot VLCC pilot station (51^O45'N 008^O15'W). You were experiencing bad weather. Plan a passage to Tarmore Bay W off Browtone head to position 52^O07.6'N 007^O08.6'W. The vessel is equipped with all latest navigational aids. Ships speed 14 kts and maximum draft is of 10m. Demonstrate the art of passage plan along the coast.

Q.2 A vessel coming out of St. George's channel TSS, the following compass bearing were observed at 0800 hrs. TUSKAR ROCK LT HOUSE: 020^O(C), KARNSORE PT TIP: 320^O(C), LITTLE SALTEE ISLAND SOUTH TIP:275^O(C). Find the position of the vessel at 0800 hrs, and the deviation of the compass, if the variation was 2^OW.

Q.3 While steering a course of 073^OT, Mine Head Light (51^O59'N 007^O36'W) was observed to bear 025^OT at 2000h. At 2020h, it bore 345^OT and at 2040h, it bore 293^OT. The current was estimated to set 028^OT. Find the vessel's position at 2020h and 2040h and rate of drift. What course must be steered to make good 073^OT?

Q.4 With vessel 5 miles due south of Tuskar Rock Bar at 1700h, Vessel alters course to pass Conningbeg light vessel, 2 miles off when nearest, counteracting a current setting due north at 2 knots. Ship's speed being 12 knots. Vessel however, was found 8 miles due south off Conningbeg light vessel at 1830h. Find the actual set and drift. (HE 10m)

PART - B
ALL QUESTIONS ARE COMPULSORY

Q.5 At Noon a vessel sailed with a buoy in position 42^O11'S 050° 15'W bearing 180^OT distance 5 miles. The log was set to zero and course was set to 050^O(C), Var. 10^OW and Dev 2^OE. At the following Noon when log registered 345', the position was found to be in Lat.37^O54'S Long. 045° 12'W. Find the course and speed made good and set and drift for the day.

Q.6 Find the Great Circle distance and the initial course between 7° N 053° W and 15^OS 012^OE.

Q.7 A vessel having a draft of forward 6m and aft 7m has to cross a bar marked 3m on the chart with an underkeel clearance of 1m. Find the earliest time she can do so during the rising tide of 7th April 1992. (Port Antwerp, ATT-VOL.1)

Q.8 (a) Explain how will you correct a chart not corrected for 2 years.
(b) Insert in pencil a wreck in position lat.: 55° 15'N long.: 016° 00'E of which the mast only are visible at chart datum.

**************************************X****X**************************************

GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:

1. Use Chart **5047** (Bristol Channel), Deviation card No. 3, HE-10 m and variation 4° E. Ship Speed 12 knots if not mentioned in the question.
2. **Positions of the landmarks are approximate and are for identification only.**
3. Use luminous range diagram as necessary.
4. Use Admiralty Tide Tables for 1992.

PART – A

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY 2 QUESTIONS FROM THE REMAINING: (30 MARKS EACH)

Q.1 A Vessel having a draft of 11.5 mtrs drops pilot at Cardiff Pilot Grounds (51° 21'N 003° 19' W) in rough weather and is bound for Swansea (51° 32'N 003° 57'W). Vessel is equipped with GPS, Radar, ARPA, Echo sounder & Doppler Log. Plan a safe passage for the intended voyage. Plot courses and distance on the chart along with way points. Vessel has to maintain safe distance of at least 2 nm away from all dangers during the voyage.

Q.2 At 0600 hrs, UTC on 2nd Feb 1992, a vessel anchored at Carmarthen Bay observes the following:

WATCH tower   (51° 42' N 004° 20'W)............. 045° (C)
Rhossili Down Tr.   (181) (51° 5' N 004° 17'W)............ 118° (C)
Helwick Lt. Vessel   .... 180° (C)
Find the   a) Compass error   b) Position of the vessel.

Q.3 a) At 1800 hrs vessel in DR Position 51° 20'N 004° 20'W observed following star sights. STAR A: Azimuth 220° T x 2' towards, STAR B: Azimuth 140° T x 1' toward. Find the vessel's position at 1800hrs.
b) From 1800 hr position vessel intends to reach 5' north of Hartland point, current was setting south at 2 Knot. Find compass course to steer?

Q.4 At 1400 hour a vessel observe radar range of Caldey island (51° 37.8'N, 004° 40.6' W) is 4 miles. Again at 1500 hour it was found that radar range of St. Gowan light vessel (51° 30.5'N 004° 59.6' W) was 5 miles. During 1400 hour to 1500 hour interval, vessel's course was 240° true and speed 8 knot, current was setting 150° true x 2 knot. Find out vessel's position at 1400 hrs and 1500 hrs.

PART - B
ALL QUESTIONS ARE COMPULSORY

Q.5 8th August at noon Cape Sorell (42° 11'S 145° 10' E) bore 070° C dist 10 nm. Ships head 292° C. From noon, courses steered by the vessel are given in the following table:

SMT	Compass Course	Log	Wind direction	Leeway	Deviation	Remarks
1200	292°	0	SW	3°	3^OE	
1700	290°	32	SW x S	2^O	3^OE	Variation 8^OE, Current set direction 178° (T) throughout. Drift 10 nm.
2100	287°	62	SSW	2^O	2^OE	
2100 – 2400	Vessel Stopped for M/E Repair work. At 2400 hr resumed passage, course 287°					

0100	285°	90	SSW	0°	1^{O}E	
0900	279°	138	SSW	3°	1^{O}E	
1200	279°	158	SSW	3°	-	

Find the EP next noon, CMG & SMG by the vessel from 8th noon to 9th noon?

Q.6 Vessel Sailed on initial G.C. Course 210^O(T) from 38° 30'S 025° 30'W. Find the longitude arrived after sailing 1000nm and the final course?

Q.7 A Vessel is to cross a bar marked 2m on chart at Elephant point in Rangoon River, ATT {II} ON 17th March 1992, at 1200 hrs. If minimum UKC of 1m is required, find the maximum draft to which vessel can load?

Q.8 Notices to mariners No: 2537 of 2012 were received for chart no. 5047 with following corrections. Do the necessary correction in the chart using correct symbols. (use pencil only)
a) Insert 'obstruction' (depth unknown) in position 51° 38'N 004° 44'W.
b) Insert 'Isolated danger mark' (Lit) in position 51° 37.9'N 004° 44'W.
c) Insert 'submarine gas pipeline' from 51°26.3'N 003° 36.2'W to 51° 14.6'N 003° 47'W.

[20 Marks]

****************************x****x****************************

GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   **PASS MARKS: 140**   **MAX. MARKS: 200**

Notes:
1. Use Chart **5048** (Ireland South Coast), Deviation card No. 2, HE 12m, Engine speed 12 knots if not mentioned in the equation. Variation 0.5^OE.
2. **Positions of the landmarks are approximate and are for identification only.**
3. Use luminous range diagram as necessary.
4. Use Admiralty Tide Tables for 1992.

PART – A

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY 2 QUESTIONS FROM THE REMAINING: (30 MARKS EACH)

Q.1 Vessel dropped pilot at 51° 45'N 007° 15'W. Her max. draft is 14m and is bound for North East bound lane of St. Georges Channel TSS. Max. engine speed 13kts. Visibility is 8 miles with light rains. Vessel is equipped with all latest navigational aids. Plan a safe passage for above situation indicating courses, distances, waypoints, other required information etc. on the chart and in answer sheet.

Q.2 While steering 056° (G), Old Head of Kinsale Lt. (51° 36.3'N 008° 31.8'W, Fl (2) 10s 72m 25M) at 1000 hrs bore 001° (G), at 1030 hrs bore 313° (G), at 1100 hrs bore 271° (G). Current setting Why, Gyro error 1^O (H), Engine Speed 10kts. Find the
a) Course & Speed made good   b) Position at 1000, 1030 & 1100 hrs   c) Drift of current

Q.3 At 1400 hrs, following compass bearings were observed by the vessel
- Ballycotton Island Lt. (51° 49.5'N, 007° 59'W) 294° (C)
- Capel Island (51° 52.8'N, 007° 51.2'W) 338° (C)
- Ram Head (51° 56.3'N, 007° 42.4'W) 008° (C)

Determine ship's position and compass error.

Q.4 At 1800 hrs, while steering 251° (G), ConinbegRacon 'M' (52° 02.4'N, 006° 39.4' W) was observed 10' off. At 1900 hrs Hook Head Racon 'K' (52° 07.4'N, 006° 55.8'W) bore 051° (G). Current was known to be setting S'ly @ 2kts. Determine ship's position at 1800 & 1900 hrs, Gyro error 1^O (H).

PART - B
ALL QUESTIONS ARE COMPULSORY

Q.5 Following courses and distances were steamed by a vessel doing 15 knots, between noon of 8th Jan till noon of 9th Jan. The noon position on 8th Jan was observed to be 10° S 45^OE.

Ship's Time	Compass course (deg)	Variation (deg) E/W	Deviation (deg) E/W
1200 – 1800	150	3^OE	2^OE
1800 – 2400	135	3^OE	6^OW
0000 – 0600	090	3^OE	5^OE
0600 – 1200	120	3^OE	4^OW

Calculate the expected noon position for 09th January.

Q.6 Calculate the Great Circle distance, initial & final course between 10° N, 40° E and 30° N, 100° E.

Q.7 Calculate the height of tide at Richmond (ATT Vol. 2, # 2821) on 29th March 1992.

Q.8 Draw following symbols as used on BA charts.
a) Fairway buoy   b) West cardinal mark   c) South Cardinal mark
d) Ocean Current   e) Wreck, depth unknown, dangerous to surface navigation.

************************X***X**************************

GOVERNMENT OF INDIA

Date: - 6TH January-2018

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours   PASS MARKS: 140   MAX. MARKS: 200

Notes:
1. Use Chart **5056** (Start point to the Needles), Deviation card No.2; Engine speed 12 knots if not mentioned in the question.
2. **Positions of the landmarks are approximate and are for identification only.**
3. Use luminous range diagram as necessary.
4. Use Admiralty Tide Tables for 1992.

PART – A

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY 2 QUESTIONS FROM THE REMAINING: (30 MARKS EACH)

Q.1 Your container ship is loaded having draft of 9.5 meters and fitted with latest bridge equipment. Plan a safe passage from Straight Point (50°37'N, 003°22'W) Pilot stn to a position 50°36'N, 002°22'W.

Q.2 While steering a course of 280^O(G), following bearings of Bill of Portland Lt. Ho. (50°31'N, 002°27'W) were observed: 1300 hrs, 331^O(G), 1330 hrs: 036^O(G) and 1350 hrs 071^O(G). If Gyro Error was 2^O High, current was estimated to set 025^O(T) at 4 kts. Find the course made good, engine speed and position at 1300 and 1350 hrs.

Q.3 At 2000 hrs following bearings were observed:
   Brownsea is Occ WRG Lt. Ho (50°41'N, 001°57'W) 281^O(G)
   Hengistbury head (50°42'N , 001°45'W) 031° (G)
   Needles Point Lt. Ho (50°40'N , 001°35'W) 081° (G)
Find ship's position & gyro error. At 2000 hrs also find distance from nearest South Cardinal Mark buoy.

Q.4 While on a course of 021^O(G) at speed of 14 kts, at 1600 hrs Start Pt. Ltd. ho (50°13'N,003°30'W) was bearing 270^O(G) and after 45 minutes Berry Head Lt. Ho (50°24'N, 003°29'W) was 6 nm away, During this period current estimated to set 045^O(T) at 3 kts, wind S'ly with leeway 2^O. If GE 2^O (H), find CMG, SMG & position at 1600 and 1645 hrs.

PART - B
ALL QUESTIONS ARE COMPULSORY

Q.5 Following courses and distances were steamed by a vessel doing 15 knots, between noon of 1st Feb till noon of 2nd Feb. The noon position on 1st Feb was observed to be 10°N30^{O}E.

Ship's Time	Compass course (deg)	Variation (deg) E/W	Deviation (deg) E/W
1200 – 1800	150	3°E	2^{O}E
1800 – 2400	135	3°E	6°W
0000 – 0600	090	3°E	5°E
0600 – 1200	120	3°E	4°W

Clocks were advanced for 1 hr at between 0300 hrs. Current setting 240° x 2.5 kts was experienced throughout. Calculate the noon position arrived at on 2nd Feb when above courses were steered and distances steamed.

Q.6 Calculate the Great Circle distance, initial & final course between 20° S 30°W and 40° S 80°W.

Q.7 Calculate the height of tide at St. Helena Bay (ATT Vol. 2, #3778) for 29th March 1992.

Q.8 Draw following symbols as used on BA charts.
a) Fairway buoy   b) East Cardinal mark   c) North Cardinal Mark
d) Submarine Power Cable   e) Isolated Danger Mark

(20 marks)

*****************************x***x*****************************

GOVERNMENT OF INDIA

Date: - 7th November-2017

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours	PASS MARKS: 140	MAX. MARKS: 200

Notes:
1. Use Chart **5072** (Falsterbo to Oland), Deviation Card No. 2; HE 12m; Engine Speed 12 knots if not mentioned in the question; Variation 6°W.
2. **Positions of the landmarks are approximate and are for identification only.**
3. Use luminous range diagram as necessary.
4. Use Admiralty Tide Tables for 1992.

PART – A

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY 2 QUESTIONS FROM THE REMAINING: (30 MARKS EACH)

Q.1 Your vessel is a deep drafted tanker having maximum draft of 19m. She is bound from deep drafted pilot station (55° 13.3 'N 013°23.5' E) to OLANDS SODRA GRUND TSS. Vessel is fitted with all modern navigations aids. Plan a safe passage with clear marking of courses and distances, alteration points for each leg of passage.

Q.2 At 1500 hrs a vessel observes bearing of Utklippan Light (55° 57'N 015° 42.6'E) WAS 032° T, range 7 miles. At 1530 hrs same light bearing was 010°T and again at 1615hrs it was 340°T. During above interval the vessel steered 108°T at 8 knots. Find course made good and set and rate of current encountered by the vessel.

Q.3 At 2000 hrs a vessel in DR, position 55° 30'N, 014° 30'E, observed the following star sights.
 ➤ Star 'A': Azimuth 210° T, intercept 1 miles towards.
 ➤ Star 'B': Azimuth 090°T, intercept 2.5 miles away.
 Find the position of vvessel at 2000hrs.
b) From 2000 hrs position, find out compass course to steer to reach pilot station off Hammerrode Light (55° 18'N, 014° 48'E) if current was setting south at 2 knots. Leeway 3° Wind SW. Ship's speed is 12 knots.

Q.4. An anchored vessel in position South of Yastad observed following compass bearings:
 ➤ Sandhammaren (55° 24'N, 014° 10'E) 067° C
 ➤ Yastad (South) (55° 25'N, 013° 49'E) – 010° C
 ➤ Abbekas (55° 23'N, 013° 06'E) – 320° C
 Find vessel's position and compass error.

PART - B

ALL QUESTIONS ARE COMPULSORY

Q.5 From the following log abstract find:-
  i) Course and distance made good Noon to Noon.
  ii) Position arrived at Noon next day.
 Noon position lat 10° S, long 10° W.

		Var	Dev	Log
Noon	Set/ Co 320° (C)	3°E	4°W	00
1800	A/Co 015° (C)	3°E	2^{O}W	75
2400	A/Co 060° (C)	4°E	4°W	153
0200	Engine Break Down			178
0400	Resume Course			00
1000	A/Co 102° (C)	4°E	4°E	68
Noon				93

Current was setting SW at 2kts throughout.   **(30 marks)**

Q.6 Find the initial and the final course and distance along a Great Circle track from a position 'A' lat 56^OS Long 67° W to a position 'B' Lat 37° S Long 19° E. **(30 marks)**

Q.7 A vessel runs lightly aground a Antwerp on 01.03.1992. Find the earliest time when she would refloat.

(30 marks)

Q.8 (a) What are the advantages of Passage Planning.
    (b) Write a brief note on 'Appraisal" stage on passage planning. **(20 marks)**

**************************x***x**************************

GOVERNMENT OF INDIA

Date: - 6th September-2017

SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 Hours	PASS MARKS: 140	MAX. MARKS: 200

Notes:
1. Use Chart **5047**, Deviation Card No.2, Variation as per chart, ship's speed 12 knots and Height of eye of the observer 10m, if not mentioned in the question.
2. **Positions of the landmarks are approximate and are for identification only.**
3. Use luminous range diagram as necessary.
4. Use Admiralty Tide Tables for 1992.

PART – A

QUESTION NO. 1 IS COMPULSORY, ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING:

(30 MARKS EACH)

Q.1 A general cargo vessel having draft of 10 mtrs drops pilot at Avonmouth pilot station (51° 21'N 003° 19'W) in rough weather and is bound for Swansea pilot station (51° 32'N 003° 57'W). Vessel is fitted with all the necessary navigation equipments. Plan a safe passage, plot courses on chart and make brief summary of passage plan in the answer sheet.

Q.2 A vessel observes the following compass bearings:
Scarweather Lt. v/l (51° 27'N 003° 56'W): 306° (C), Porthcawl point Lt. Ho.(51° 28'N 003° 42W): 006° (C),
Nash Point Lt. H. (51° 24' N 003° 33'W): 076° (C)
Find the vessel's position and calculate the deviation. Variation 8°W.

Q.3 At 1000hrs, on a vessel steering 080^O(T), Caldey Island Light bore 030^O(T). At 1030hrs the Caldey Island Light bore 000° (T), and at 1100hrs same Light bore 330° (T) and at 1112hrs Hevick lt. v/l bore 094^O(T). Determine
(a) Course and speed made good   (b) Course and Rate of current

Q.4. A Vessel while steering a course of 036° (T) observes Lundy is South light (51° 09'N 004° 39'W) for the first time at 1800hrs. The visibility at this time was 5 miles. The light was obscured at 1836hrs. If the current was setting 340° (T) at 3 knots, find:
(a) Position of vessel at 1836hrs   (b) Course and speed made good

PART - B

ALL QUESTIONS ARE COMPULSORY (Question Nos: 5,6,7 carry 30 Marks each; Question No.8: 20 Marks)

Q.5 10th Noon position 15° 00'N 040° 00'E set course as follows:

	Time	Co (C)	Dev	Var	L'way	Wind	Log
	1200	082°	2^O W	1^O E	1^O	E	0
a/c	2000	100°	2^O W	3° E	2^O	E	120
a/c	0200	166°	3° W	1^O E	3°	E	198
a/c	0800	245°	3° W	2^O E	NIL	NIL	272
a/c	1200						332

A current setting NW at 2 knots throughout. Clocks were retarded by 1 hr at midnight. The engines were stopped for repair from 0400 to 0600 hrs. Find the EP next noon and the course and distance made good.

Q.6 Find the great circle distance, initial course and final course from A 30° 00'N, 085° 00'E to B 42° 00'N, 110° 00'E.

Q.7. Vessel having draft F: 7m, A: 8m wants to clear a bar (charted depth 6m), at Mumbai (#4359) on 20.01.1992 with a UKC of 1m. Find the earliest time in evening to cross the Bar?

Q.8 Draw chart symbols for the following:
(a) Wreck dangerous to navigation   (b) Temple   (c) Eddies   (d) Gas supply pipeline
(e) Mean Sea Level   (f) Submarine cable (g) Unused pipeline   (h) Wreck

**************************X***X***************************

Code

TIME: 3 HOURS　　　　**PASS MARKS: 140**　　　　**MAX MARKS: 200**

Notes:
1. Use Chart No. 5072 (Falsterbo to Oland), Deviation Card No.2; HE 12 m; Engine Speed 12 knots if not mentioned in the question; Variation 6° W.
2. Positions of the landmarks are approximate and are for identification only
3. Use luminous range diagram as necessary
4. Use Admiralty Tide Tables for 1992

PART - A
QUESTION NO. 1 IS COMPULSORY. ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING:　　　　　　　　　　　　　　　　**(30 MARKS EACH)**

Q. 1 Your vessel having a draft of 18.5 m and speed of 16 knots, drops pilot at Simrishamn pilot station (55° 33.5'N, 014° 24.0'E) and is bound for Kullagrund pilot station (55° 13.3' N, 013° 23.5'E) for deep draught tankers. Good visibility and strong N'ly winds previl. Vessel is equipped with all the required navigational equipment including ECDIS Keeping in mind the UKC policy of your company, plan a safe passage for the intended voyage. Courses and all necessary details to be marked on the chart, Tabular passage plan to be written/drawn on the answer sheet

Q. 2 A vessel heading 245° (C) near Hammerodde Lt Ho (55° 18'N 014° 47'E) observes the bearing of the Lt Ho as 137° (C) with a Radar range of 2.2'. Find the position of the vessel. Thereafter, with the current setting 345° (T) at 2 knots, the vessel steered a course of 258° (T). Find the course and speed made good and also the distance off from Sandhammaren Lt.Ho (55° 23'N 014°12'E) when it is abeam to stbd.

Q. 3 A vessel anchored south of YSTAD observes the following compass bearings
SANDHAMMAREN　(55°23'N 014°12'E):　067°Ⓒ
YSTAD (SOUTH)　(55°25'N 013°49'E):　001°Ⓒ　　6.7°W.
ABBEKAS　(55°23'N 013°36'E):　316°Ⓒ
Find the vessel's position and compass error.
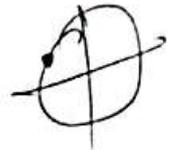
Q. 4 A Ship steering 118° (T) observes Utklippan Racon (55°58'N 015°20'E) at 1600 hrs bearing 060° (T). At 1620 hrs the same light bore 032° (T) and at 1650 hrs it bore 340°(T). Find the vessel's position at 1650 hrs, the course made good and the rate of current, if the set was 068° (T).　　55°N　　　　107°　　　　3.84°
　　　　　　　　　　　　15°E
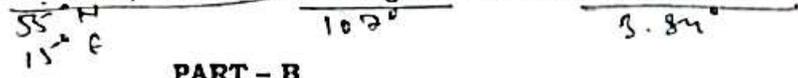
PART – B
ALL QUESTION ARE COMPULSORY

Q. 5 1st January noon time vessel was in position 00°30'S 065°30'E, sailed on following courses till next day noon time. Find vessel's position on 2nd January noon time, Effective CMG and DMG. 1200hr to 2000hr course 80° true, speed 12knot. 2000hr to 2200hr to and 2300hr to next day until 0400hr course was 120° true, speed 13knot. 2200hr to 2300hr engine break down took place. 0400hr to 1200hr course was 150° true, speed 12.5knot. Throughout current was setting 030°T @ 2knots. Ship's clocks were adv. by 1 hr at night.

Q. 6 Vessel is on GC track between 10° 00'S, 150°00'W to 40°N, 160°00'E, Find out GC distance, Initial course and final course.　　4824.83　　N 39 E
　　　　　　　　　　　　　　　　　　　　　　　N 54 E

Q. 7 Find out height of tide at port Deal ATT volume I on date 01.01.92 at time 1400hr LT. 2.3

Q. 8 Correct the chart for followings: Wreck dangerous for surface navigation in 50°14'N 002°59'W Tidal rips in position 50°16'N 003°06'W, Obstruction depth unknown in position 50°08'N 001°58'W　　　　　　　　　　　　　　　　　　　　　[20Marks]

JULY – 2017
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Q-8. Draw.
Fairway buoy　　　West cardinal Mark　South C.M.
Ocean Curr　　　Wreck, depth unknown, danger to surface nav.

GOVERNMENT OF INDIA
SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

Code 96A

TIME: 3 HOURS   PASS MARKS: 140   MAX MARKS: 200

Notes:

1. Use Chart No. **5056** (Start point to the Needles), Deviation card No. 2; HE 12 m, Engine speed 12 knots if not mentioned in the question; Variation 7° W
2. **Positions of the landmarks are approximate and are for identification only**
3. Use luminous range diagram as necessary
4. Use Admiralty Tide Tables for 1992

PART - A

QUESTION NO. 1 IS COMPULSORY. ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING: (30 MARKS EACH)

(30Marks)

Q 1 Explain the process of preparing passage plan.

Q. 2 Following 3 bearings were observed of Bill of Portland light (50°30.8N 002°27.4'W):
1000 hour   340°True, Vessel was 10' of from Bill of Portland light.
1024 hour   002°True   1054 hour 028°True,
Course steered by vessel was 265° True, engine speed was 12 Knots.
Find CMG, Set and drift of vessel and vessel's position at 1054 hour.

Q. 3 1200 hour vessel observes radar distance of Berry head light (50°24.5'N 003°28.8'W) was 6' same vessel again at 1230hr observes radar distance of Start point light (50°13.4'N003°39'W) was 5'. During time interval between 1200hrs to 1230hrs course steered by vessel was 175° (T), engine speed was 12 Knot, Current was setting 270°(T) at rate 2Knot. Find out vessel's position at 1200hr and at 1230hour

Q. 4 At 1800 hour vessel was in DR position Lat 50°12'N long 002°30'W
Observes following star sights.
Star A Azimuth 128°T, Intercept 2'Toward
Star B Azimuth 210°T, intercept 1'Away
Find out vessel's position at 1800 hour
From 1800 hour position find out course to steer to reach 6' south of anvil point light.
Current was setting throughout 150°True at rate 2knot. Ship's speed 12Knots.

PART – B:
ALL QUESTION ARE COMPULSORY

Q. 5 From the following log abstract find the course and distance made good from noon to noon. At noon a point of land in 50°25.5'S 179°40'W bore 338° C, distance 16nm and the ship's head 079°C.

	Deviation	Varition	Log
Set course 028°C	6°E	12°E	0
1600 h A/Co 248°C	7°W	12°E	32
2000 h A/Co 079°C	14°E	12°E	62
2400 h A/Co 343°C	4°E	14°E	96
0400 h A/Co 188°C	1°W	14°E	126
0800 h A/Co 051°C	8°E	14°E	157
NOON	--	--	190

Throughout the above period, the current set 082°T @ 1Kn. Also find the position at next noon

Q. 6 Find the initial and final course and great circle distance from Lizard point (49°50' N, 005°12'W) to Barbodas (13°06'N, 059°20'W).

Q. 7 Find the earliest time to sail out of Walnut Groove (Sacramento River, ATT Vol.3), after 7 'o' clock in the morning of the 17th Feb '92. Master wants a height of tide at least 1m, at the time of sailing.

Q. 8 Draw the chart symbols which are used on B.A. charts for the following:
a) Gas Supply pipeline
b) Fish haven
c) Limit of safety zone around offshore installation.
d) Wreck, depth unknown, dangerous to surface navigation.
e) Rock awash at chart datum.
f) Ocean current
g) No bottom found until 250m depth
h) Submarine power cable
i) Quarantine anchorage area
j) Over falls, tide rips

[20Marks]

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GOVERNMENT OF INDIA
SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

Code 93A

TIME: 3 HOURS   PASS MARKS: 140   MAX MARKS: 200

Notes:

1. Use Chart 5056 (**Start point to The Needles**), Deviation Card No.1, HE-10 m and variation as per chart 6°W. Ship Speed 12 knots if not mentioned in the question
2. **Positions of the landmarks are approximate and are for identification only**
3. Use luminous range diagram & ATT 1992 as necessary
4. PART - A: Qn No1 is compulsory, attempt any two questions from remaining
5. PART - B: Qn No 5,6,7 carries each 30 Marks; Qn No.8: 20 Marks

PART - A   (30 MARKS EACH)

Q.1 A Bulk of carrier with a maximum draft of 11m drops pilot at Needles Channel pilot station (50° 37.8' N 001° 39' W) and is bound for Portland Harbour (50° 36' N 002° 25' W). Vessel is equipped with all the required Navigational equipments including ECDIS. Plan a safe passage for the intended route considering the UKC policy of your company .Courses need to be plotted on the chart. Course and distance for the each leg of passage and course alteration points to be clearly shown on the charts.

Q.2 A vessel observew following bearing of Bill of Portland light (50° 30.8' N, 002° 27.4' W):
1200 hours –330°T , 1230 hours –000° T , 1300 hours –030°T.
Course steered by vessel during 1200 hours to 1300 hours was 260° T, speed 12 knots. Current was setting 350° T, rate unknown. Find out vessel's speed, position at 1200 hours, 1300 hours, and rate of current?

Q.3 At 1000 hours Horizontal sextant angle between Hope's nose (50° 27.8' N 003° 29'W) and Berry head (50° 24' N 003° 29' W) was 20° and again at 1100 hours same vessel observes radar distance of start point (50° 13.5' N 003° 38.8' W) was 8 miles. Between 1000 hours to 1100 hours course steered by vessel was 210° T, speed 10 knots. Current was setting 270° T at rate of 1 knot . Find vessel's position at 1000 hours and 1100 hours?

Q.4 At 2000 hrs a vessel last sighted Anvil point light (50° 35.5' N, 001° 57.6' W) & at 2100 hours same vessel first seen Bill of Portland light (50° 30.8' N, 002° 27.4, W). During 2000 hrs to 2100 hrs course steered by vessel was 240° T and speed 10 kts, Find out vessel's position at 2000 hr and 2100 hours .(Met visibility was 2 miles throughout the period)

PART B   ALL QUESTIONS ARE COMPULSORY

Q. 5 On 1st February noon time a vessel was 5n mile south east of position lat 35° 40'N long 080° 30'E, steamed following courses:
1200 hr course was 45°T and 1800 hour next alteration was 1200T, Engine breakdown took place between 2000 hour to 2100 hour and clocks were retarded by 01 hour at mid-night. Next alteration was made at 0300 hour as 170°T and vessel steered same course till 2nd Feb noon time. Throughout sailing vessel's engine speed was 12 knot and current was setting west at rate of 3 knot. Find out EP on 2nd February noon time, CMG and DMG.

Q.6 Find Initial co, Final co and posn of vertex between position 30° N, 060°E to 50°S, 155°E

Q.7 Find the height of tide at port Seattle date 08.03.1992 (ATT no 9147) at 0900 hr LMT

Q.8 a) In admirality weekly notice to mariners chart no. BA 5056 has following permanent Corrections, ADM WNM No.3 of 2011 correction no. 105:
Obstruction for surface navigation' in position 50° 31.8'N 003° 26'W
Carry out chart correction for the same and make necessary entry in chart. Assume BA 5056 is corrected and up to date for all notices previous to ADM WNM No. 03 of 2011 (Correct the chart by pencil)
b) Write notes on following – Chart Datum, Natural scale, Meridional part, plate dimension

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GOVERNMENT OF INDIA
SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

Code 90A

TIME: 3 HOURS   **PASS MARKS: 140**   **MAX MARKS: 200**

Notes:

1. Use Chart **5047 (Bristol Channel)**, Deviation Card No.2, HE-12 m and variation as per chart. Ship Speed 12 knots if not mentioned in the question
2. **Positions of the landmarks are approximate and are for identification only**
3. Use luminous range diagram & ATT 1992 as necessary
4. PART - A: Qn No1 is compulsory, attempt any two questions from remaining
5. PART - B: Qn No 5,6,7 carries each 30 Marks; Qn No.8: 20 Marks

<div align="center">

PART – A   (30 MARKS EACH)

</div>

Q.1 A Vessel having a draft of 10 m drops pilot at Cardiff Pilot Grounds (51° 21' N 003°19' W) in gale force winds and is bound for Swansea (51° 32' N 003° 57' W) while the vessel is equipped with ARPA, Echosounder, Doppler Log. She is also experiencing steering problems. In view of the above, plan a safe passage for the intended voyage. Write a summary of passage plan in the answer sheet

Q.2 At 0600 hrs. UTC, a vessel anchored at Carmarthen Bay observes the following:
Watch tower (51° 42' N 004° 20' W) ....045°(C)
Rhossili Down Tr. (181) (51° 35' N 004° 17 W] .... 118°(C)
Helwick Lt. vessel ....180°(C)
Find the a) Compass error   b) Position of the vessel

Q.3 At 1000 hour vessel observes bearing of Caldey Island light (51°37.8'N 004° 40.6' W) 030°C, 1030 hrs bearing of same was 000°C and at 1100 hrs it was 330°C, during 1000 hrs to 1100 hrs vessel's course was 080°C, speed 12 knots, current was southerly. Find out CMG, SMG and rate of current

Q.4 A vessel while steering a course 034° (T) observes Lundy Island South Lt. (51° 09' N 004° 39' W) for the first time at 2000 hrs. The visibility at this time was 5 miles. The light was obscured at 2036 hrs. If the current was setting 338° (T) at 3 knot, find:
a) Position of the vessel at 2036 hrs   b) Course & speed made good

<div align="center">

PART B   ALL QUESTIONS ARE COMPULSORY

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Q.5 At noon on 10th March, vessel is in observed position 36° 20'S 020° 30'W. Then vessel steered the following courses till next day noon

Com co   Dev   Var
S 30°E   6°E   2°W   90 miles
S 10°E   1°E   2°W   30 miles
S 5°E   2°E   2°W   120 miles

The clocks were retarded by 30 minutes during this period
a) Calculate the D.R.Noon position on 11th March
b) If by observation, Noon position on 11th March was 40° 00'S 018° 20.5' W, Find the set and drift of the current

Q.6 Find the great circle distance, and final course from position 'A' in Lat 08° 15' N Long 078° 00'E to position 'B' in Lat. 33° 50'S long 025° 30'E

Q.7 On 15th Feb 1992, what will be earliest time on a rising tide that a ship with maximum draft 5.5m can cross a bar marked 4m in Antwerp (ATT-I) with an UKC of 1.5m.

Q.8 Following NTM (No. 2438/2013) were received for chart no. 5047. Do the necessary correction in the chart using correct symbols. (Use pencil only)
a) Under water obstruction (depth unknown) in position 51° 36.5'N 004° 41.5'W
b) Isolated danger mark (Lit) adjacent to position (a) above
c) Submarine cable from 51° 24'N 003° 33'W to 51° 14.6'N 003° 47'W
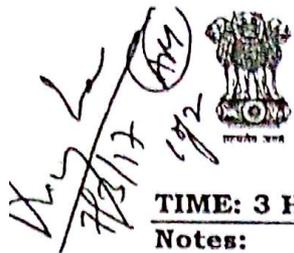
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GOVERNMENT OF INDIA
SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

Code 91A

TIME: 3 HOURS   PASS MARKS: 140   MAX MARKS: 200

Notes:
1. Use Chart **5056 (Start point to The Needles)**, Deviation Card No.1, HE-10 m and variation as per chart 6°W. Ship Speed 12 knots if not mentioned in the question
2. **Positions of the landmarks are approximate and are for identification only**
3. Use luminous range diagram & ATT 1992 as necessary
4. PART - A: Qn No1 is compulsory, attempt any two questions from remaining ·
5. PART - B: Qn No 5,6,7 carries each 30 Marks; Qn No.8: 20 Marks

PART – A   (30 MARKS EACH)

Q.1 A vessel having maximum draft of 8.5 meters sailed out from Portland harbour. She disembarked her pilot in position 50° 35.2'N 002° 22'W. From this position, plan your safe passage to join south west bound traffic lane off East channel Racon. Courses to be plotted on the chart, with clear marking of course and distance and each course alteration point for each leg of passage

Q.2 At 1200 hrs radar distance of Anvil point light house was 7 miles & same vessel at 1306 hrs observes radar distance of bill of Portland light was 8 miles. During interval between 1200 hr to 1306 hr course steered by vessel was 260° (T), engine speed was 9 knot, current was setting 185°(T) at a rate of 1 knot. Find vessel's position at 1200 hr and also at 1306 hrs

Q.3 a) At 1800 hrs vessel is in DR position lat 50° 15'N Long 003° 00'W observes following stellar bearing & found intercept as star A Azimuth 125°(T) intercept 1' Towards and at 1820 hrs star B Azimuth 205°T Intercept 1'away . Between 1800 hr to 1820 hr CMG of vessel was 272°(T), SMG was 12 knot (for 2nd observation 1820hr EP was used in taking 2nd sight). Find vessel's position at 1820 hrs.   (20 marks)
b) From 1820 hours position vessel want to reach 2 miles east of start point light(50° 13.4' N 003° 38.5'W), current is southerly at 1 knot. Find out course to steer? Engine speed was 12 knot after 1820 hrs onward   (10 marks)

Q.4 At 1200 hour an anchored vessel observes following compass bearings:
Straight point light (50° 36.4'N 003° 21.4'W)   042°C
Ness light (50° 32'N 003° 30'W)   292°C
Hope's Nose light (50° 28'N, 003° 28.6'W)   221°C
Vessel's DR position was at 50° 31'N 003° 37'W. Find vessel's position & also compass error

PART B   ALL QUESTIONS ARE COMPULSORY

Q. 5 M.V. MZXY sails from a position 03°25'N 085°32'E at 1600h local time (zone:-5.5h) on May 3rd. If her destination is port of Lima (33° 42'N 140° 36'E)(Zone:-09h) determine the following:
a) ETA to be given to Lima pilots at an average speed of 14kts (Assume one straight rhumb line course between the two points)
b) If an oil rig ZXT-16 was expected to pass 8M bearing 270°T at 1600h ship's time on May 4th but was observed to be bearing 090°T distant 6M at that time, what is the set and rate experienced. Clocks were advanced 60 minutes at 0000 hrs 4th May

Q.6 Find out Great circle distance, initial course, and position of vertex between following positions: From 19°00'N 067° 00'W to 36° 00'N 006° 30'W.

Q.7 Find out the height of tide at 1215 hrs IST on 10th April 1992 at port Navlakhi (ATT-2)

Q.8 a) Extracts of Admiralty weekly notice to mariners No. 04 of 2012. No. 625 is as follows:
i) Insert isolated danger mark buoy in position 50° 34.2'N 002° 38.2'W,
ii) Insert oil rig (lit) in position 50° 41'N 001' 50'W
Correct the chart and record the correction for the NM 625 of 2012 in pencil.
b) How will you verify whether the chart was corrected up-to date prior to this correction?

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GOVERNMENT OF INDIA
SECOND MATE OF A FOREIGN GOING SHIP
FUNCTION: NAVIGATION
PAPER: TERRESTRIAL & COASTAL NAVIGATION

Code 86A

TIME: 3 HOURS   **PASS MARKS: 140**

MAX MARKS: 200

Notes:

1. Use Chart No. **5047**, Deviation card No. 2, Variation as per chart, ship's speed 12 knots and Height of eye of the observer 10m if not mentioned in the question
2. **Positions of the landmarks are approximate and are for identification only**
3. Use luminous range diagram as necessary
4. Use Admiralty Tide Tables for 1992

PART - A

QUESTION NO. 1 IS COMPULSORY. ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING: (30 MARKS EACH)

Q.1 A vessel having a draft of 10m drops pilot at Bristol pilot grounds (51º 21' N 003º 19' W) and is bound for Swansea (51º 32'N 003º 57'W) while vessel equipped with modern equipment in Moderate Visibility. Plan a safe passage for the intended voyage

Q.2 A vessel in position 51º 11.0'N 004º 49.4'W at 2300 sailing on a course of 131ºT, at 2320 south Lundy Light (51º 9.5'N 004º 40.0'W) was First observed and at 23 50 North Lundy light was just obscured. Find CMG, SMG, engine speed and position at 2350 if current was setting 3 Knots SW

Q.3 AT 1800 hours, following compass bearings were observed

Scar weather Light Vessel	085º C
Mumbles Hd	055º C
Porteynon pt (51º 32.4'N 004º 12.4'W).	018º C

Find Ship's position at 1800 hours and compass deviation if variation was 2ºW

Q.4 A vessel doing a course of 034 T took sun sight at 0800 hours and worked with long by chron method gave an azimuth of 040ºT DR latitude 51 22.4'N Obs Long 004 42'W. At 0930 Caldey Island Lt observed 330º T. Current was setting 240º T at 3 knots and Engine speed was 10knots. Find CMG, SMG and ship's position at 0800 hours

PART - B

ALL QUESTIONS ARE COMPULSARY
(Question Nos: 5,6,7 carry 30 Marks each; Question No.8: 20 Marks)

Q.5 At noon on 20th Nov a light house in lat 05 46'N 79 36'E bore 000 (C), error 3W, distance 10 M. course was then set to 225 (C) Dev 1E, Var 2W, and Log 0. At 2000, engine broke down and log was showing 80, was hauled in. at 2200, engines were repaired and course was reset to 200 (C) Dev 2E , Var 2 W log 0. Ship maintained this course till noon next day when log showed 130. A current was estimated to set 320(T) at 3 knots throughout. Find the EP at noon on 21st Nov

Q.6 Find GC distance and initial Course from 20º 30' S 120º 15'E to 36º 20'N 179º 40' E and also find vertex

Q.7 Find the earliest GMT time to pass 1m clearance below a bridge with charted height of 15m at Antwerp (#1539) on 6th February 1992. Use ATT Vol. I for a vessel on even keel draft of 9m with top of mast 26m from keel

Q.8 Draw chart symbols for the following
(i) Wreck unknown depth, dangerous to surface navigation   (ii) Reporting point
(iii) Quarantine anchorage area   (iv) Suspended well over which depth is known
(v) Anchoring prohibited area

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TIME: 3 HOURS   PASS MARKS: 140   MAX MARKS: 200

Notes:

1. Use Chart **5047 (Bristol Channel)**, Deviation Card No.2, HE-12 m and variation as per chart. Ship Speed 12 knots if not mentioned in the question
2. **Positions of the landmarks are approximate and are for identification only**
3. Use luminous range diagram & ATT 1992 as necessary
4. PART - A: Qn No1 is compulsory, attempt any two questions from remaining
5. PART - B: Qn No 5,6,7 carries each 30 Marks; Qn No.8: 20 Marks

PART – A   (30 MARKS EACH)

Q.1 A General cargo vessel having a draft of 10 mtrs drops pilot at Avonmouth pilot station (51° 21'N 003° 19'W) in rough weather and is bound for Swansea pilot station (51° 32'N 003° 19'W) in rough weather and is bound for necessary navigational equipments. Plan a safe passage for the intended voyage. Courses to be plotted on the chart, Provide a brief summary of passage plan in the answer sheet

Q.2 At 1000 hrs following compass bearings were taken by the vessel at anchor:
Foreland pt. (51° 14'N, 003° 47'W)   - 130°(C)
Highveer pt. (51° 14'N, 003° 55'W)   - 166°(C)
Ilfracombe Pt. (51° 13'N, 004° 0.65'W)   - 225°(C)
Find deviation for the ship's head and vessel's position at 1000 hrs

Q.3 At 1800 hrs while steering a course of 240°(T) at 15 knots, Morte point (51° 11.2'N 004° 13.8'W) bore 080° (T) 10.5 miles off. At 1820 hrs Hartland point light (51° 01.8'N 004° 31.5'W) bore 160°(T) and at 1900 hrs, it bore 120°(T). Find:
a) Course & speed made good between 1800 hrs & 1900hrs
b) Position of vessel at 1900hrs   c) Rate and direction of current

(handwritten: ω:6, 225)

Q.4 A vessel steering a certain compass course, observes following at 1900 hrs
Govan's Head pt. (37) (51° 35.8'N, 004° 55.4'W)   259°(C)
Caldey Is.Lt (51° 37.9'N, 004° 41.0'W)   079°(C)
St. Govan Lt. Vessel (51° 30.6'N, 004° 59.7'W) was 30° on her starboard bow. At 1930 hrs find the same Lt. Vessel 60° on her starboard bow. Find position of vessel at 1900 hrs and the compass route steered by the vessel

(handwritten: 5 i.9.8, 4 ⟨6.8)

PART B   ALL QUESTIONS ARE COMPULSORY

Q. 5   August 15th at noon, point of land in Lat 42° 11' S, Long 145° 10' E bore N 70° E by compass x 11'. Ship's head N 68° W (C), Variation and deviation as per log

Time	Speed	Compass co.	Wind	Leeway	Deviation
1200	8kts	N 68° W	SW x S	3°	3° E
1700	7kts	N 70° W	SW x S	2°	3° E
2100	7kts	N 73° W	SSW	2°	2° E
0100	6.5kts	N 75° W	SSW	0°	1° E
0500	6kts	N 78° W	SSW	2°	0°
0900	5kts	N 81° W	SSW	3°	1°W

Till Noon   Note: Variation 8° E for the first 12 hrs and 6° E afterwards
Find the course and distance from noon to noon and her D/R position on 16th August noon.

Q.6 A vessel sailed on an initial great circle course of 210° (T) from 38° 30' S 025° 30'W. Find the longitude reached after the vessel has traversed 1,000 M.

Q.7 Clearance of a Bridge given on the chart is 80m. Mean High Water Spring (MHWS) level is 5m. What will be the bridge clearance at 1200 hours LMT at Antwerp on 4th April 1992?

Q.8 A light vessel with Recon (U) is placed in position 51° 33' N 004° 42'W, characteristics Fl (2) 10 sec 55 ft 14 M. Offshore oil platform (Lit) is established in position 51° 32'N 004° 42' W. Correct the chart and record the correction for the NM 12 of 2014 in pencil. How will you verify whether the chart was corrected up-to-date prior to this correction?

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JAN 2017

TIME: 3 HOURS   **PASS MARKS: 140**   **MAX MARKS: 200**

Notes:

1. Use Chart No. 5056 (Start point to The Needles), Deviation Card No. 2 Speed 12 knots if not mentioned in the question;
2. **Positions of the landmarks are approximate and are for identification only**
3. Use luminous range diagram as necessary
4. Use Admiralty Tide Tables for 1992

08/11/2016.

PART - A

QUESTION NO. 1 IS COMPULSORY. ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING:

(30 MARKS EACH)

Q.1 Your ship is an oil tanker having all modern bridge equipment with maximum sea speed of 14 kts and draft of 13m. Plan a safe passage from Needles Channel Pilot station (50°38'N, 001°39'W) to Exmouth Pilot Station off Straight Point (50°36'N, 003°22'W). Weather: Good visibility, Wind NW'ly x force 6.

Q.2 While steering a course of 052°(G) at a speed of 14 kts, following bearings of Start point Lt Ho. (50°13'N, 003°38'W) were observed: 1030 hrs.: 355° (G), 1100 hrs: 308°(G) and 1140 hrs 265°(G). If GE was 1° High, current was known to set at 3 kts in NE quadrant. Find course made good, speed made good, exact direction of current and position at 1140 hrs.

Q.3 After dropping pilot at Pilot Boarding ground at 2000 hrs off Berry head light Ho (50°24'N, 003°29'W) vessel intends to pass Bill of Portland Lt ho (50°31'N, 002°27'W) by 5 NM. Find compass course to steer counteracting current setting 025° (M) X 3 kts, wind NE'ly with leeway of 3°. Variation 3°W and ships speed 16 kts.

Q.4 While at anchor following compass bearings were observed at 1200 hrs:
Trinity Hill 203 (50° 45'N , 002°59'W) 300° C
Shipton Hill 168 (50° 44'N , 002°42'W) 058° C
Hardy Monument 240 (50° 41'N , 002°33'W) 097° C
Find ship's position & Deviation of compass (Variation 6° W)

PART - B

ALL QUESTIONS ARE COMPULSARY

(Question Nos: 5, 6, 7 carry 30 Marks each; Question No.8: 20 Marks)

Q.5 Initial position of the vessel 20° 15'S, 160° 30'E.
From the following log abstract find:
a) Course and distances made good Noon to Noon
b) Position arrived at next day Noon

	Compass Co	Var	Dev	Leeway	Wind	Speed
Set/Co	313°(C)	3°E	3°E	2°	N	12.5kts
2000 A/C	027°(C)	4°E	2°W	3 °	N	12.3kts
0200 A/C	074°(C)	5°E	7°W	Nil	NE	13.1kts
0800 A/C	123°(C)	6°E	1°E	3°	E	14.0kts

Current was setting SW @ 2 knots throughout. There was an engine breakdown from 0400hrs to 0530hrs. Clocks were retarded by 1 hour at midnight.

Q. 6 Calculate the great circle distance, Initial Course and Vertex from position 56° 45'N 065° 32'E to position 33° 36'N 132° 20'E.

Q. 7 A vessel runs lightly aground at Antwerp at 0400hrs on 01.03.1992. Find the earliest time when she would refloat.

Q.8 a) What are the advantages of Passage Planning.
b) Write a brief note on 'Appraisal' stage of passage planning

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GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
OFFICER INCHARGE OF A NAVIGATIONAL WATCH

FUNCTION: NAVIGATION

PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 HOURS   PASS MARKS: 140   MAX. MARKS: 200

NOTES:
1. Use Chart No. 5072(Falsterbo to Oland), Deviation Card No. 2;Height of eye (HE) 12 m; Engine Speed 12 knots if not mentioned in the question; Variation 6° W.
2. Luminous range diagram may be provided if necessary.
3. Use Admiralty Tide Tables for 1992.
4. Positions of landmarks are approximate and are to be used for identification only.

PART – A:
QUESTION NO.1 IS COMPULSORY. ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING: (30 MARKS EACH)

Q. 1 Plan a safe passage from Pilot Station (55°57.5'N 014° 38'E) off Silinasudde Lt ho to Trelleborgs Redd pilot station (55°20.5'N 013°06'E). Ship's draft 7.65 m and minimum UKC required 0.5 m. Vessel is feeder container ship fitted with latest bridge equipments.

Q. 2 A vessel steering 120° (T) observes Kullagrund Racon (55° 20'N 013° 20'E) at 1400hrs Bearing 050° (T). At 1420hrs bearing 025° (T). 1450hrs bearing 350° (T). Find the vessel's position at 1450hrs, the course made good and the rate of current, if the set was 210° (T).

Q. 3 A vessel at anchor observes the following compass bearings:
   a) Christianso (5) Lt. (55° 19.2'N 015° 11.4'E) : 065° (C)
   b) Svaneke Lt. (55° 08.0'N 015° 09.0'E) : 161° (C)
   c) Hammerrodde Lt. (55° 17.8'N 014° 46.6'E) : 284° (C)
   Find the vessel's position and the deviation on the ship's head

Q.4 A vessel, engine speed 9 knots was in position 55°32.25'N 015° 29.4'E at 0630 hours. She sets her course for 'Taggen' pilot stn. (55° 53.4'N 014° 35.5'E) allowing only for 5° leeway for NE'ly winds.
At 1030 hours her echo sounder alarm sounded showing just 3m UKC (draft 8.7m, Height of tide 2.7m). Estimate the ships position now & the cause for this.

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PART – B:
ALL QUESTIONS ARE COMPULSORY

Q. 5 A vessel steams the following courses by Gyro compass. Gyro error 2^0
High   30

11th Jan	1200 – Co.140^0 (G) Speed 14.0 knots
a/c	1600 – Co 188^0 (G) Speed 15.0 knots
a/c	2000 – Co 166^0 (G) Speed 16.0 knots
22nd a/c	0400 – Co 102^0 (G) Speed 15.5 knots

and continued till noon, 12th Jan, At 1900 on 11tht Jan, a light house
in 38°28.5' N 065° 05'E bore 4 points on the starboard bow and
at 1930 it was abeam. Find the 12th noon DR position, the course
and distance made good noon to noon.

Q. 6 Find great circle distance, initial course and final course from position 06°   30
N, 079° W to position 38° S, 175° E.

Q. 7 A vessel at Hastings (#086) having draft F 6.10m, A 6.20m wants   3 0
to cross a bar with an UKC of 2m. Chart depth 6m. Find the earliest
time on 25th March 1992 to cross the bar.

Q.8 a) Define Geographic range, Nominal range and Luminous range.

                                                                                                         20.
b) On the parallel of 55° 20'N & between the meridians of 016° 00'E 016°
30'E draw the following chart symbols:
(i)   No bottom found at the depth of 150 meters.
(ii) Sounding of Doubtful depth.
(iii) Ebb stream of 3 knots.
(iv) Isolated danger mark.
(v)   Production platform.

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GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
OFFICER INCHARGE OF A NAVIGATIONAL WATCH

FUNCTION: NAVIGATION

PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 HOURS   PASS MARKS: 140   MAX. MARKS: 200

NOTES:

1. Use Chart No. 5056 (Start point to The Needles), Deviation Card No. 2; HE 12 m; Engine Speed 12 knots if not mentioned in the question; Variation 6° W.
2. Luminous range diagram may be provided if necessary.
3. Use Admiralty Tide Tables for 1992.
4. Positions of landmarks are approximate and are to be used for identification only.

PART – A:

QUESTION NO.1 IS COMPULSORY. ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING: (30 MARKS EACH)

Q. 1) A vessel having maximum draft of 12.5 meters sailed out from Portland harbour and disembarked her pilot in position 50°35.2'N 002°22'W. Plan your passage from pilot position to join southwest bound traffic lane of East channel recon. Courses and distances to be plotted on the chart with each alteration course for each leg of passage. Also, mark all relevant hazards on the chart and the answer sheet.

Q. 2) In DR Position 50° 00.0'N; 002° 00.0'W at 2000 hours, the vessel observed Star A with azimuth of 160 (T) intercept 2.6' away and Star B with Azimuth 075 (T), intercept 2.0 miles Towards. Find the Ship's position. From this position, find the Compass course to Steer to sight the Bill of Portland light right ahead when 8.5 miles off, if the current is 305 (T) at 3 knots. Also find the CMG & SMG.

Q.3) At 2100 hrs a vessel observes East Channel Light Float (49°59'N, 002°29'W) to bear 270°(C) x 5.8 miles. At 2136 hrs it bore 221°(C) and at 2230 hrs it bore 150° (C).If the ship was steering a course of 292° (C), 0Find:

    (a) Course and speed made good.

    (b) Set and drift of current

    (c) Ship's position at 2100 hours & 2230 hours.

Q.4) A vessel at anchor observes the light Occ. WRG (50° 41.5'N 001° 52.5'W) to bear 283°(C). Spire of Church (50° 43'N 001° 52.6'W) bore 353°(C) and Water Tank (50° 43.5'N 001° 48'W) bore 036°(C). Find the ship's position and the deviation on the ship's head.

Contd..... 2...

PART – B:

ALL QUESTIONS ARE COMPULSORY

Q. 5 From the following log abstract find co. and distance from N/N to N/N and Positioning arrived at next noon I.e. – 22ⁿᵈ Jan.

Position @ 21ˢᵗ Jan Noon- 20°30'N; 040°20.0'E

	Comp. Co	Variation	Deviation	Leeway	Wind	Log
N/N Set co.	283°	3°E	5°W	3°	NNE	000
2100hrs a/c	044°	4°E	2°E	2°	N	111
0100hrs a/c	067°	5°E	4°E	4°	N	149
0800hrs a/c	340°	5°E	2°W	1°	N	206
Noon						256

Current was setting at NE@2Knts throughout. Clocks were advanced by 1Hr at midnight. Engines were stopped for repairs from 0400Hrs to 0630Hrs.

(30 Marks)

Q. 6 Calculate the great circle distance, Initial Course and Vertex from position 20°N 075°W to position 045°N 050°W   (30 Marks)

Q. 7 A vessel drawing following drafts of Fwd 6.0m, Aft 7.0m has to clear the bar of charted depth of 6m at Bombay (#4359) on 15ᵗʰ Feb 1992 with UKC of 2m. Find the earliest time in the evening when the vessel can do so. (30 Marks)

Q. 8 Carry out following corrections (weekly notice 13/2016) with pencil on your chart:
   a. Notice no 372/2016: Shift Needles Channel pilot station to new position 50°37'N, 001°41.4'W.
   b. Notice no 415/2016: Insert yellow can buoy named "AZ" in position 50° 37.5'N, 002°58.5'W with yellow light flashing twice every 15 seconds.
   c. Notice no 1005/2016: Insert wreck over which depth is 18.3 meters in position 50° 36'N, 003°10.3'W.
   d. Notice no 1311/2016: Insert underwater rock overwhich depth is unknown dangerous for surface navigation in position 500 30.3'N, 002°23.6'W.

(20 marks)

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GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
OFFICER INCHARGE OF A NAVIGATIONAL WATCH

FUNCTION: NAVIGATION

PAPER: TERRESTIAL & COASTAL NAVIGATION

TIME: 3 HOURS   **PASS MARKS: 140**   **MAX. MARKS: 200**

NOTES:
1. Use Chart No. 5048, Deviation Card No. 2;
2. Luminous range diagram may be provided if necessary.
3. Use Admiralty Tide Tables for 1992.
4. Positions of landmarks are approximate and are to be used for identification only.

PART – A:
QUESTION NO.1 IS COMPULSORY. ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING: **(30 MARKS EACH)**

Q. 1 A vessel dropped pilot at VLCC pilot station (51°45'N 008°15'W). You were experiencing bad weather. Plan a passage to Tarmore Bay W off Browston Head to a position 52°07.6'N, 007°08.6'W. The vessel is equipped with all latest nav. Aids. Ship Speed 14kts. And max draft of 10 mtrs. Demonstrate the art of passage plan along the coast.

Q. 2 A vessel coming out of St.George's channel TSS, the following compass bearing were observed at 0800 hrs.TUSKAR ROCK LT HOUSE: 020°(C), CARNSORE PT TIP:320°(C), LITTLE SALTEE ISLAND SOUTH TIP: 278°(C). Find the position of the vessel at 0800 hrs, and the deviation of the compass if the variation was 2deg.W.

Q. 3 A vessel steering a course of 094(T), at 0900 hrs. Mine head pt. Lt<(51°49.5'N 007°35'W) bore 049(T) at 0930 hrs it bore 354(T) and again at 1010 hrs it bore 318(T). During the period the current was setting 176(T) at 4kts. Find the Vessel's position at 0900 hrs and 1010 hrs and the engine speed of vessel and the course made good.

Q. 4 A vessel off Bailey cotton gas field in Dr. Position 51°30.0'N, 008°06.0'W a star gave azimuth 330(T) 2 miles towards. There after the radar was in operational and vessel encountered restricted visibility. Find the safe courses to steer so as to reach 2 miles off old head of Kinsale lt house. Also find the distance steamed on the first course. The vessel's speed was 10 kts in reduced visibility and the current was setting 215(T) at 2 knots. What is the principle involved?

PART – B: ALL QUESTIONS ARE COMPULSORY

Q. 5 On 10th Feb, the noon position was 18°52.0N, 0072°52.0'E. The vessel steamed as follows:

Time	Course (G)°	gyro error°	speed by log
1200	237	1H	15.0
a/c 1700	283	1L	16.0
a/c 2000	262	Nil	15.0
a/c 0400	197	1L	14.5
1200	197	1L	15.0

At 0200 clocks were retarded by one hour.

Find I) the DR position at Noon on 11th Feb.
If at noon on 10th Feb, the fix was 15°50.0'N 068° 26.0'E, find II) set and drift of current.

Q. 6 Find the initial course, distance and final course from position 24°00'N 074° 30' E to 48°00'N 145° 18'E

Q. 7 A vessel at port Hedland, having a draft F:6.0m A:8.0m wishes to cross a shoal marked 4m on the chart with an under keel clearance of 1m. Find the earliest time on the rising tide of 16th April 1992 she can do so?

Q. 8 Implement the following correction on chart:
a) Wreck over which exact depth is unknown but which is considered to have a safe clearance at depth 20m in position 51°34'N, 008°04.0'W.
b) An quarantine anchorage centered in position 51°54.0'N, 007°47.2'W to a radius of 1.00NM.
c) Historic wreck and restricted area in position 51°27.0'N, 007°50.0'W centred 1 NM
d) Submarine power cable in position 52°04.8'N,007°19.5'W extending to adjoining coast in a direction 020 DEG

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GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
OFFICER INCHARGE OF A NAVIGATIONAL WATCH

FUNCTION: NAVIGATION

PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 HOURS   PASS MARKS: 140   MAX. MARKS: 200

NOTES:
1. Use Chart No. 5056 (Start point to The Needles), Deviation Card No. 4; HE 12 m; Engine Speed 15 knots if not mentioned in the question; Variation 5^0 W.
2. Luminous range diagram may be provided if necessary.
3. Use Admiralty Tide Tables for 1992.
4. Positions of landmarks are approximate and are to be used for identification only.

PART – A Q.1 is Compulsory.

ATTEMPT ANY THREE QUESTIONS: **(30 MARKS EACH)**

Q. 1 A Bulk carrier with a maximum draft of 11m drops pilot at Needles Channel pilot station (50° 37.8'N 001° 39'W) and is bound for Portland Harbour (50° 36'N 002° 25'W). Vessel is equipped with all the required Navigational equipments including ECDIS.
Plan a safe passage for the intended route considering the UKC policy of your company. Courses need to be plotted on the chart. Course and distance for each leg of passage and course alteration points to be clearly shown on the chart.

Q. 2 While on a course of 210°(T), a vessel observes Berry Head Light (50° 24'N 003° 29') at 2100hrs to bear 239°(T), at 2130hrs to bear 258°(T) and at 2212hrs to bear 342°(T). At 2212hrs Start Point Light (50 13'N 003 30'W) bore 230 (T), if the set and rate of current had remained the same, find the course to pass 5nm off Start Point Light. Also find the time when this light will be abeam.

Q. 3 A vessel steering 014°(T) observed Start point Light house(50°13'N,005°38'W) bearing 295°(T) at 2100 hours. At 2118 hours, the fixed red light at Start point also became visible and at 2136 hours the light bore 235(T).Also at 2136 hours Berry Head light house (50°24'N,003°29'W) bore 342° (T). Find the following:
a) Ship's position at 2100 hours and 2136 hours.
b) Course and speed made good from 2100 hours to 2136 hours.
c) Set and drift experienced from 2100 hours to 2136 hours.

Q. 4 From a vessel steering 255° (T), east Channel Beacon (49°59'N, 002°29'W) was last seen at 2030 hours and at 2100 hours Channel Light Vessel (49°54'N, 002°55'W) was first sighted. During this interval, the meteorological visibility was 2 miles and the vessel experienced a Leeway of 3° (Wind Southerly) and current setting 320° (T) at 3 knots. Find the ship's position at 2100 hours and 2030 hours.

PART – B: ALL QUESTIONS ARE COMPULSORY

Q. 5 From the following log abstract find co. and distance from N/N to N/N and Positioning arrived at next noon ie – 22nd Jan.

Position @ 21st Jan Noon- 20°30'N; 040°20.0'E

	Comp. Co	Variation	Deviation	Leeway	Wind	Log
N/N Set co.	283°	3°E	5°W	3°	NNE	000
2100hrs a/c	044°	4°E	2°E	2°	N	111
0100hrs a/c	067°	5°E	4°E	4°	N	149
0800hrs a/c	340°	5°E	2°W	1°	N	206
Noon						256

Current was setting at NE@2Knts throughout. Clocks were advanced by 1Hr at midnight. Engines were stopped for repairs from 0400Hrs to 0630Hrs.

Q. 6 Calculate the great circle distance, Initial Course and Vertex from position   56° 45'N 065° 32'E to position 33° 36'N 132° 20'E.

(30 marks)

Q. 7 A vessel drawing following drafts of Fwd 6.0m, Aft 7.0m has to clear the bar of charted depth of 6m at Bombay (#4359) on 15th Feb 1992 with UKC of 2m. Find the earliest time in the evening when the vessel can do so.

Q. 8 a) Extracts of Admiralty weekly Notice to Mariners No. 04 of 2012. No. 625 is as follows:

Insert isolated danger mark buoy in position 50° 34.2'N 002° 38.2'W, Insert Oil rig (lit) in position 50° 41'N 001° 50'W

Correct the chart and record the correction for the NM 625 of 2012 in pencil.

b) How will you verify whether the chart was corrected up-to date prior to this correction? Briefly explain the guidelines for correcting the BA charts.

(20 marks)

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GOVERNMENT OF INDIA

SECOND MATE OF A FOREIGN GOING SHIP
OFFICER INCHARGE OF A NAVIGATIONAL WATCH

FUNCTION: NAVIGATION

PAPER: TERRESTRIAL & COASTAL NAVIGATION

TIME: 3 HOURS   PASS MARKS: 140   MAX. MARKS: 200

NOTE:
1. Use Chart No. 5047 (Bristol Channel), Deviation Card No. 2, HE-12 m and variation as per chart. Ship Speed 12 knots if not mentioned in the question.
2. Luminous range diagram may be provided if necessary.
3. Use Admiralty Tide Tables for 1992.
4. Positions of landmarks are approximate and are to be used for identification only.

PART - A:

QUESTION NO.1 IS COMPULSORY. ATTEMPT ANY TWO QUESTIONS FROM THE REMAINING: (30 MARKS EACH)

Q. 1 Plan a safe passage providing all the details from Port Talbot pilot station to Cardiff pilot station. Plot the courses on chart and mark accordingly for a vessel drawing 12 mtrs draft.

Q. 2 At 1700 hrs Nash Point Light (51° 24.2'N, 003° 33.1'W) was 6 miles off by radar & at 1745 hrs Scarweather Light vessel Light (51° 26.8'N, 003° 56.2'W) was 4 miles of by radar. During this period, the vessel steered a course of 290° (C) and experienced a current setting 170° (T) at 4 knots and Northerly wind caused leeway of 5°. Determine the vessel's position at 1700 hrs and 1745 hrs.

Q. 3 At 1100, on a vessel Steering 080°(T), Porteymon Pt.(43) (004° 13'W, 51° 31.5'N) bore 030°(T), at 1130 it bore 000°(T) and at 1200 bore 330°(T). Determine Course and Speed made good and the rate of current if the current was setting south.

Q. 4 a) At 1900Hrs ship in DR position 51° 20'N; $004^\circ20'$W observing following: Star A Azimuth 218°(T) X 2' Towards; Star B: Azimuth 143°(T) X 1.5 Toward. Find the vessel Position at 1900Hrs.
b) From 1900Hrs position vessels intends to reach 5.5' North of Hartland point. Current was setting south at 2Knot. Find the compass course to steer?

PART – B: **ALL QUESTIONS ARE COMPULSORY**

Q. 5 On 21st June @ $^{N}/_{N}$. Position 20° 15′ S; 160° 30′ E, from the following log abstracts find

- Courses & distance made good noon to noon
- Position arrived at noon on 22nd June

Time	Compass Co.	Variation	Deviation	Leeway	Wind	Speed
Noon	313° C	3°E	3° E	3	N	12.5
2000 A/c	027° C	3° E	2° W	3	N	12.3
0200 A/c	075° C	3° E	6° W	Nil	NE	13.1
0800 A/c	123° C	3° E	1° E	3	E	14.0

Current was setting SW @ 2.5knots throughout. Engine breakdown from 0400hrs to 0600hrs and clocks retarded by 1Hr at Midnight

Q. 6 Find the distance, initial course and the final course on great circle from position 24° 00′N 074° 15′W to 46° N 053° 45′W. **(30 Marks)**

Q. 7 Calculate the UKC for a vessel drawing drafts of F= 9m and A=10m. When she passes over shoal charted 10m at St. John (ATT Vol II. # 2864) at 0400 on 7th Feb 1992

Q. 8 Define the following :
a) Chart Datum, b) Routing Charts.
c) Isogonic -Lines. d) Drying Heights. e) ODAS Buoy.
(20 Marks)

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