

Indian Maritime University
(A Central University, Govt of India)
End Semester Examinations – December 2024

DNS

2nd Semester

UD11T5201

NAVIGATION III: NAVIGATION & CHARTWORK

Date: 10.12.2024

Max Marks: 70

Duration: 03 Hrs

Pass Marks: 35

General Instructions

- (i) All Sections (A, B & C) are to be attempted.
- (ii) Options, if any, are specified in respective section.
- (iii) Tables (Steam/Log/Nautical Almanac etc) that can be used.
- (iv) Chart Work Booklets to be used.
- (v) Any other tables/charts to be used.
- (vi) Scientific Calculators (Non Programmable) are allowed
- (vii) Tidal graph and English Channel Chart BA 5049 to be used.

Section A

Ten MCQs/Fill in the Blanks of 01 Mark each – Choose the correct answer as applicable. (1x10 Mark)

1. Mercury is not suitable for Navigation as it is:

- a) Superior Planet
- b) Inferior planet
- c) Is always very close to Sun
- d) Is always very far from the Sun

2. Mariners Handbook NP 100 is used to understand abnormal meteorological conditions and phenomenon. (True/ False)

3. Speed of Earth in its orbit around the Sun is:

- a) Maximum when at apohelion
- b) Minimum at apohelion
- c) Remains Constant

- 4 A celestial body will be at Zenith when:
- (a) When its declination is Zero
 - (b) When its declination is same as the Latitude of the observer
 - (c) When its declination is zero and LMT is 1200
 - (d) When its GP is same as the observer position
- 5) The luminous range of light is the:
- (a) Range identified on the chart
 - (b) Charted range corrected for the visibility.
 - (c) Charted range corrected for observer's height of eye.
 - (d) Same as geographical range.
- 6) A vessel with draft 5m is at anchor in an area where charted depth is 4m, if the height of the tide is 12m, the depth of water under the keel is:
- (a) 7m
 - (b) 11m
 - (c) 12m
 - (d) 5m
- 7) When a celestial body reaches its highest altitude:
- (a) LMT is 1200
 - (b) Its True Azimuth is 000 or 180
 - (c) Its Declination is same as the Latitude of the observer
- 8) Information on services such as Navtex, VTS and Ice advisory service can all be found in :
- (a) Admiralty list of Radio Signals.
 - (b) Sailing Directions
 - (c) Annual notice to mariners.
- 9) The rise and fall of sea level is effected by:
- (a) Wind
 - (b) Barometric Pressure
 - (c) Gravitational attraction of sun and moon
 - (d) All the above
- 10) In PZX triangle, angle P is:
- a) Equal to LHA if the celestial body is West of the observer.
 - b) Equal to LHA if the celestial body is East of the observer.
 - c) Equal to $360 - \text{LHA}$ if the celestial body is West of the observer.

Section B

Five Questions of 02 Marks each

11. On a certain day in longitude 35°W , the Moon's LHA was 335° , when GHA γ (GHA Aries) was 263° . Find the SHA of the Moon.
12. Define SENC in ECDIS and state its significance
13. What is the cause of seasons and changes in the day and night durations at different places on the earth.
14. Describe the use of Ocean Passages of the world.
15. Find GP of Sun at GMT Mar 04d 05h 23m 09s

Section C

ALL FIVE QUESTIONS TO BE ANSWERED.

16. On 29 Nov 2008 in DR $26^{\circ} 27' \text{N}$ $130^{\circ} 27' \text{W}$, the sextant altitude of the Sun UL East of meridian was $28^{\circ} 11'$, at GMT 17h 47m 49s. If HE was 10m and IE was 2.3' off the arc, calculate the direction of the LOP and the longitude where it cuts the DR Latitude. **(10 Marks)**
- 17 Find the Great circle distance and initial course from
A $06^{\circ} 00' \text{N}$ $79^{\circ} 00' \text{W}$ to B $38^{\circ} 00' \text{S}$ $179^{\circ} 00' \text{E}$ **(10 Marks)**
- 18 At 2000Hrs Bill of Portland light bore 045(T) and at 2100Hrs the same light bore 309(T). Vessel was steering a course of 085(T) at engine speed of 11 Kts. Northerly wind was causing a leeway of 5 degrees, current was setting 180(T) at 2 kts. Find the CMG & the position of the vessel at 2000Hrs & 2100Hrs. **(10 Marks)**
- 19 On 23rd Sept 2008, in DR $23^{\circ} 40' \text{N}$ $161^{\circ} 56' \text{E}$, the sextant meridian altitude of the Sun's LL was $66^{\circ} 10.6'$. If IE was 2.3' on the arc and HE was 10.5m, find the latitude and LOP. **(10 Marks)**

20. Find the height of tide at 1500Hrs UTC at Bhavnagar on 20th Day of November 2024 for which data is given as per below (ZT-0530): **(5 Marks)**

| <u>Time</u> | <u>Height of water (m)</u> |
|-------------|----------------------------|
| 0148 | 6.9 |
| 0724 | 1.1 |
| 1338 | 7.2 |
| 1942 | 1.2 |

(b) Explain the base and standards modes of ECDIS Display. **(5 Marks)**