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**Indian Maritime University**  
**(A Central University, Govt of India)**

**Mar/Apr 26 SE**  
**Programme Name: DNS**

**Semester: 2**

**Subject Code: UD11T6204**

**Subject Name: Celestial Navigation**

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Date: 11.03.2026

Max Marks: 70

Duration: 03 Hrs

Pass Marks: 35

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General Instructions

- (i) All Sections (A, B & C) are to be attempted.
- (ii) Scientific Calculator is Permitted
- (iii) (Nories Table/Nautical Almanac etc) permitted.

**Section A**

MCQs/Fill in the Blanks of 01 Mark each – Choose the correct answer as applicable.

1. The Horizon system of units comprise of

- A RA ; dec
- B dec ; GHA
- C SHA; dec
- D Alt ; Az

2 If for a celestial body, GHA = 325DEG and LHA=55DEG then the Observer longitude is \_\_\_\_\_

- A 90DEG E
- B 90 DEG W
- C 120DEG W
- D 110 DEG E

3. The parallel of latitude 23.5 deg S refers to

- A Antarctic circle
  - B Arctic circle
  - C Tropic of Capricorn-
  - D Tropic of Cancer
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4 Speed of Earth in its Orbit around the Sun is  
A Maximum when at Aphelion  
B Minimum at Aphelion  
C Remains Constant.

5. Which is an inferior planet?  
A Saturn  
B Jupiter  
C Mars  
D Venus -

6. The summer solstice in northern hemisphere occurs somewhere closer to the date  
A 22 June-  
B 22 December  
C 21 March  
D 23 September

7. The Prime vertical circle is passing through  
A North south point  
B Sensible horizon  
C Equinoctial  
D East west point-

8. The time zone of the longitude 038 Deg E is  
A + 3  
B - 2  
C + 3  
D + 2

9. When a celestial body reaches its highest altitude  
A LMT is 1200  
B Its True Azimuth is 000 Or 180 Deg  
C Its Declination is same as the Latitude of the Observer  
D Its Azimuth is 090 or 270 Deg

10. Polar distance PX is  
A 90-declination-  
B 90-lat  
C 90-alt  
D 90.zenith distance

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### **Section B**

Five Questions of 02 Marks each

11. State the conditions needed to be fulfilled for a body to be Circumpolar.
12. Define the Ecliptic.
13. Define Local Hour Angle (LHA)
14. Define Amplitude of a celestial body.
15. Define Superior Planets

### **Section C**

Five Questions of 10 Marks each.

16. At a ship in DR  $44^{\circ} 31'N$   $69^{\circ} 42'E$ , the azimuth of the Sun was  $100^{\circ}$  (C) when GMT was 20<sup>TH</sup> July, 2008 04hrs 06min 12sec and variation was  $8^{\circ}W$ , find the deviation for the ship's head.

17 Explain Total Penumbral and partial, Lunar Eclipse with Diagram.

18A: Calculate the GP in the following case: Celestial Body Sun Date 04 March 2008 GMT 23h 14m 44s (5Marks)

18.B : Prove the formula  $\sin \text{Amp} = \sin \text{Dec} / \cos \text{lat}$ . (5Marks)

19. On 21st Jan 2008, in DR post  $24^{\circ} 36S$   $110^{\circ} 20W$  the sextant altitude of the sun LL on the meridian was  $85^{\circ} 03.5$ . If the IE was 1.6' off the arc and the HE was 10 m, Find the latitude and state the direction of the LOP.

20. An observer obtains the meridian altitude of a body as follows: above the Pole  $88^{\circ} 00m$  to the south and below the pole  $10^{\circ} 15m$  to the North. Calculate the Latitude and Declination. Draw a neat diagram to show your understanding.

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