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Indian Maritime University
(A Central University, Govt of India)
Sep/Oct'25 SE
Programme Name: B Sc (NS)
Semester: 4
Subject Code: UG21T5405
Subject Name: Meteorology

Date: 12.09.2025 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) Ship's Weather Code is permitted.

Section A
Choose the correct answer as applicable (10 x 1mark = 10 marks)

1. A Tropical Revolving Storm may cause the water level in coastal areas to rise suddenly leading to a _____ (Storm Surge/Tsunami)

2. Doldrums are the permanent low pressure area over the _____ (Tropics/Equator)

3. _____ (Spring Tides/Neap Tides) occur when the Moon is at 1st or 3rd quarter and separated from the Sun by 90° as viewed from the Earth.

4. Readings of the Hygrometer are not accurate if the ventilatory winds are less than _____ (7 knots/5 knots)

5. _____ (Sea Breeze/Land Breeze) blows from a couple of hours before noon till sunset

6. A _____ (Col/Trough) is an area between two high pressure areas and two low pressure areas situated alternately

7. For a TRS in the Northern Hemisphere, the Right Hand Semi Circle is the _____ (Navigable Semicircle/Dangerous Semicircle)

8. A single high tide and low tide occurring every day is described as _____ (Diurnal Tide/SemiDiurnal Tide)

9. A _____ (Continental Tropical/ Maritime Tropical) air mass is a warm & dry air mass.

10. In order to obtain the correct atmospheric pressure at sea level, always _____ (Add/Subtract) the height correction to the bridge barometer reading.

Section B
Answer all Five Questions (5 x 2marks = 10 marks)

11. What is a Secondary Cyclone?
12. Define Dew Point Temperature and Relative Humidity.
13. Explain how Katabatic winds get formed.
14. With reference to a Tropical Revolving Storm, define the terms Vertex and Dangerous Quadrant
15. What factors affect the salinity of surface seawater and how?

Section C
Answer any five questions out of seven (5 x 10 marks = 50 marks)

16. Encode the following weather report using the Ships Weather Code. (10 marks)

Ship: ATTA, Position: 00deg. 03S 045deg. 56W,

CMG in last 3 hrs. 315 deg. At 12 kts.

Visibility: 11 nautical miles

Wind: 140 degrees estimated at 3 kts.

Atmospheric Pressure: 1011.2 mb. Tendency: +2.2 mb Barograph trace: ———

GMT: 01d 18h 15m

Temperature: Dry 27.5 deg. C Wet 23.8deg. C Sea 22.8deg. C

Clouds: Total- 5 oktas, low clouds- 4 oktas of the sky, base 1500 m above sea level

Cumulus of moderate vertical extent, Altocumulus present with Nimbostratus. No high level clouds seen

Present Weather: Intermittent slight drizzle

Past Weather: Clouds covering more than half of the sky throughout, Rain

Sea: Period 2 sec, Height 0.5 m

Swell: From 050 deg. Period 4 sec, height 1 m.

17.
a) Write a short note on Ridge and Trough. (5 marks)

b) Describe the Southwest monsoon regime occurring seasonally over the Indian subcontinent. (5 marks)

18.

a) With the help of sketches, explain sequentially the origin and formation of a Frontal Depression. (5 marks)

b) With the help of sketches, explain the formation of Land and Sea Breeze. (5 marks)

19.

a) Write a short note on the Voluntary Observing Fleet program under the Indian Meteorological Department. (5 marks)

b) Explain Synoptic and Prognostic categories of weather facsimile charts (5 marks)

20.

a) Explain in detail the risks associated with accumulation of ice on ships. (5 marks)

b) Explain the formation of Advection Fog and enumerate the reasons for it's dispersal, mentioning any one area in the world where mariners are likely to experience advection fog. (5 marks)

21.

a) Explain in detail the 1-2-3 theory of Tropical Revolving Storm avoidance along with a sketch of the same. (5 marks)

b) Enumerate and explain in brief the ideal conditions for the formation of a Tropical Revolving Storm. (5 marks)

22.

a) Explain with the help of a sketch, the principal, construction and operation of an Aneroid Barometer. (5 marks)

b) What are the main causes for the formation of ocean currents? State any two examples each, of cold currents and warm currents. (5 marks)

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