Indian Maritime University

(A Central University, Govt. of India)

Supplementary Examinations – September/October 2024

Programme Name: B Sc (NS)

Semester: 4

Subject Code: UG21T5405

Subject Name: Meteorology

Date: 30.09.2024	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) Ships Weather Code to be used.

Section A

Ten MCQ's of 01 Mark each – Choose the correct answer as applicable.

1. What is the westernmost longitude reached by the TRS center at the time of re-curving called as?
a. Vortex
b. Vertex
c. Cod
d. Trough

2. What among the following are the objectives of the World Meteorological Organization:
a. To facilitate the exchange of weather information across national borders
b. To provide the framework for international cooperation at a global scale on meteorological issues
c. To be the United Nation Organizations authoritative voice on the state and behaviour of the Earth's atmosphere
d. All of the above

3. What is Frost Point?
a. The freezing point of water
b. When the Dew Point temperature falls below freezing point it is termed as Frost Point
c. The temperature at which supercooled water freezes
d. It is the same as Dew Point

4. What are the Doldrums?
a. The permanent low pressure area over the equator
b. The permanent high pressure area over the equator
c. The permanent low pressure area between the tropics
d. The permanent high pressure area between the tropics

5. How is the tidal range on the days of Spring tide?
a. Tidal range is maximum
b. Tidal range is minimum
c. Tidal range is exactly at the mean average for the month
d. Neither Spring nor Neap tides influence the tidal range

6. The curved vertical lines on a Barograph chart paper:
a. Have a curvature which depends on the speed of the drum rotation
b. Have exactly the same radius of curvature as the diameter of the rotating drum
c. Have exactly the same radius of curvature as the pen arm
d. Have exactly the same radius of curvature as the radius of the rotating drum

7. What is a Col?
a. A high pressure area surrounded by areas of low pressure
b. A low pressure area jutting into areas of high pressure
c. An area between two highs and two lows situated alternately
d. A high pressure area jutting into areas of low pressure

8. What are Weather Analysis Charts?
a. Charts showing the existing weather situation at the preceding synoptic hour
b. Charts showing the predicted weather situation for a specified future time
c. Charts showing the existing weather situation at the preceding additional synoptic hour
d. Charts showing the predicted weather situation for the next 24 hours

9. What is the cause of the formation of Advection fog off Newfoundland coast?
a. The moisture laden winds of the Southwest monsoon
b. The convergence of the Gulf Stream & the Labrador current
c. The large amounts of water vapour near the equatorial regions

d. The extremely cold weather in the Newfoundland

10. Which type of icebergs have an irregular shape with pinnacle shaped tops?
a. All icebergs irrespective of their origin
b. Only icebergs of Antarctic origin
c. Icebergs of ice shelf origin
d. Icebergs of glacier origin

Section B

Five Questions of 02 Marks each

11. What is the cause of Index Error in an Aneroid Barometer?

12. Explain the different factors which affect the state of visibility.

13. What factors affect the salinity of surface seawater and how?

14. Define Dew Point Temperature and Relative Humidity.

15. Explain the characteristics and location of the ITCZ.

Section C

Seven Questions of 10 Marks each of which any 05 questions to be answered.

16.

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

(b) Describe the Northeast monsoon regime occurring seasonally over the China seas. (5 marks)

17.

(a) With the help of sketches, explain sequentially the origin and formation of a Frontal Depression. (6 marks)

(b) What influence do the characteristics of the source regions have on air masses formed in the Polar, Tropical, Maritime and Continental areas. (4 marks)

18.

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

(b) Explain the formation of Radiation Fog and Advection Fog. (5 marks)

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

Ship: WAKA, Position: 00deg. 05S 046deg. 58W,

CMG in last 3 hrs. 270deg. At 10 kts.

Visibility: 500 meters

Wind: 152deg estimated at 15 kts.

Atmospheric Pressure: 1018.6 mb. Tendency: +6.6 mb Barograph trace:

GMT: 20d 06h 10m

Temperature: Dry 27.5 deg.C Wet 23.8deg C Sea 20.7deg C

Clouds: Total- Overcast with a few blue patches, low clouds- 4 oktas of the sky, base 1500 m above sea level

Cu of strong vertical extent, Ac in a chaotic sky, Cc present

Weather: Present: Visibility poor due to dust in suspension in the air, not raised by wind at or near the ship

Past: Thick haze, thunderstorm

Sea: Period 07 sec, Height 0.3 m

Swell: From 180 deg. Period 09 sec, height 03 m.

20.

(a) Explain in detail the 1-2-3 theory of Tropical Revolving Storm avoidance with the help of a sketch. (6 marks)

(b) Enumerate and explain in brief the ideal conditions for the formation of a Tropical Revolving Storm. (4 marks)

21.

(a) Elucidate the main causes of the formation of ocean currents. (5 marks)

(b) Explain how tides influenced by the phases of the moon. (5 marks)

22.

(a) Explain the danger associated with the accumulation of large quantities of ice on ships and the measures that can be taken to avoid ice accumulation. (5 marks)

(b) Describe the principal, use and operation of the Barograph. (5 marks)

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