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16/06/2017 AIN

INDIAN MARITIME UNIVERSITY

(A Central University, Government of India)

May/ June 2017 End Semester Examinations

Diploma in Nautical Science- Second Semester

(AY 2015 batch onwards)

Navigation - IV Advanced Bridge Equipment, Watchkeeping and Meteorology (UD11T3202)

Date : 16.06.2017 Maximum Marks: 70

Time: 2 Hrs Pass Marks : 35

Note: 1. Attempt Q. No. 1 and any other 3 Questions from Section A.
2. Attempt Q. No. 6 and any other 2 Questions from Section B. All Questions carry equal marks;
3. Use of 'Ship's Weather Code 1982 is permitted in the exam hall.

SECTION –A

BRIDGE EQUIPMENT AND WATCH KEEPING

1. a) What is the significance of Rule 6 (a) (iv) which states that "In determining a safe speed, at night the presence of background light such as from shore lights or from back scatter of her own lights should be taken into account." (5 marks)

   b) Draw a sketch to display lights displayed during night and shapes displayed during day by a vessel more than 100 meters length at anchor and list out the sound signals made by this ship during restricted visibility. (5 marks)

2. a) Trace the journey of radar pulses from their transmission from the Radar scanner to painting on a PPI as a targets. Indicate how each of the four units of Radar are used with a sketch showing position of each of the four units. Components of individual unit need not be shown. (5 marks)

   b) Draw a simple sketch of a Doppler log and explain how it can measure fore and aft speed as well as speed in athwarship direction. (5 marks)

3. a) Write a brief note on AIS explaining its full form, its purpose, its effective range, one advantage over radar and one limitation. (5 marks)

   b) Why are Vector charts superior to Raster charts? (5 marks)

4. a) A relieving OOW, prior to taking over a watch on a ship, is required to check and confirm number of items and data about Navigation, Weather, Equipment and Special Instructions etc. List out any five points about Bridge Equipment which the OOW should check.(5 Marks)

b) List out any five measures which should be taken by an OOW during an anchor watch. (5 Marks)

5. (5 x 2 Marks each)

i. How is a log book maintained on a ship useful in case of an accident?
ii. Who maintains Movement Book and name any two data entered in it.
iii. Name any six types of meteorological data entered in Deck Mates Log.
iv. Show contents of Compass (Azimuth error) book in a tabular format. NO EXPLATION IS TO BE GIVEN.
v. Who carries out Departure Control Test and name any two equipment or functions which are tested during this test.

SECTION –B
METEOROLOGY

6. (10 Marks)

Encode the weather report which reads

A vessel (c/s STNH) on 27th December 2007, at 1825 Hrs (UTC) in position 15° 37'N, 070°59'E.
Course made good in last 3 hours – 225°(T) / speed 12knots.
Estimated Wind NE – 12 kntos, Horizontal visibility 10 Km.
Temperatures ; Dry bulb 31.0°C. Wet bulb 24.0°C. Sea water 26.5°C,
Present Pressure 993.9hPa, Barometric Tendency 2.0 mb, decreasing steadily

Present Weather : Moderate intermittent non-freezing rains at time of observation. Past Weather Thunder storms with rain.

7/8th sky covered with clouds. Stratocumulus clouds formed by the spreading of cumulus, with the base of the lowest cloud at 800m above sea level.

Nimbostratus with a significant covering of 5/8th of the sky.

Cirrus in the form of filaments, strands or hooks, not progressively invading the sky.

The wind waves period of 5 sec and height 4.5 m. Swell direction Northerly, period of 8 sec and a height 4.5m.

7. a) Explain how advection fog is formed in North Atlantic and describe a method for predicting it. (5 Marks)

b) i) Explain how Spray is formed and how it affects visibility at sea. (2 Marks)

ii) Cirrus clouds are often sighted at sea. Briefly describe their appearance and what conclusions can OOW draw when cirrus is sighted. (3 Marks)

8. a) Draw a sketch showing path of TRS in a Southern Hemisphere indicating its position relative to the equator, and its Track, Path, Trough and Vertex (5 Marks)

b) i) Draw a sketch showing formation and path of Katabatic winds (3 Marks)

ii) Give two reasons why katabatic winds are dangerous. (2 Marks)

9. a) What causes a drift Current? Draw a map to show any two major oceanic drift currents. (5 Marks)

b) Write a brief note on Tsunami explaining cause of its origin, its effect on a ship at sea and origin and effect of 2004 Tsunami in the Indian Ocean. (5 Marks)

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