INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)

May/June 2016 End Semester Examinations
B.Sc. (Nautical Science) - Second Semester (2013 batch onwards)

Nautical Physics Paper – III (T 2205)

Date : 17.06.2016 **Maximum Marks: 70**
Time: 3 Hrs **Pass Marks : 35**

Note: Answer any SEVEN from the following 9 questions.
All questions carry equal marks.

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1. a) Explain with neat diagram, construction and working of sextant (5)

   b) An object placed 48 cm from a lens produce a virtual image at a distance of 8 cm in front of lens. Calculate the focal length of the lens. (5)

2. a) Define relative humidity, dew point and absolute humidity. (5)

   b) A water fall is 800 metres high. Assuming that the entire kinetic energy gained during fall is converted into heat. Calculate the rise in temperature of water at the base of the fall. (5)

3. a) Explain with principle, construction and working of prism binoculars (5)

   b) On a certain day the RH is 66.67%. The saturated vapour pressure at room temperature is 18.6 mm. Calculate the saturated vapour pressure at dew point. (5)

4. a) Define Doppler effect in sound and explain the following cases in detail. (5)

   i. Source moves away from the stationary observer
   ii. Source moving away from the observer and the observer moving towards the source

   b) When a car sounding its horn of frequency 500 Hz passes a stationary observer with a speed of 25 m/s, the frequency changes in the ratio 9:10. Calculate the velocity of sound. (5)

5. a) Explain with principle, diagram, the phenomenon of optical fiber. (5 Marks)

   b) What are the effects of different parameters on velocity of sound in air and water? (5Marks)

6. Write short note on ANY TWO of the following: (10 Marks)Carnot's cycle

i. Entropy
ii. Heat Engine & Refrigerator

7. a) Explain briefly the following: (5 Marks)

(i) fog & Mist (ii) Snow and Hail

b) Explain how the "echo sounder" has been employed for measuring the depth of water (5 Marks)

8.a) Explain the working principle of solar cell. List their uses. (5 Marks)

b) One kg of water at 373 K is converted into steam at the same tempreture. Volume 1 cm^3 of water becomes 1671 cm^3 on boiling. Calculate the change in the internal energy of the system if the latent heat of vaporization of water is 5.4×10^5 calories/kg. (5 Marks)

9. a) What is a LASER. On what principle does it works. Discuss the uses of a laser (5 Marks)

b) Distinguish between Saturated and Un-Saturated vapour pressure.(5 Marks)

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