

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

**End Semester Examination December 2017**

**Programme:** B.Sc (Nautical Science)

**Semester:** I

**Subject Name:** Nautical physics

**Subject Code:** UG21T3103

**Date:** 09.12.2017

**Maximum Marks:** 70

**Time:** 3 Hrs

**Pass Marks:** 35

**Part-A**

(Compulsory question – 10 Marks)

1. a) State first law of thermodynamics. (2 marks)
- b) Explain why wheel house windows are required to be inclined. (2 marks)
- c) Define one decibel. (2 marks)
- d) Define Mechanical advantage and velocity ratio. (2 marks)
- e) Define Angle of contact. (2 marks)

**Part -B**

Answer any five from the following questions

(5×12=60)

2. a) Define the terms enthalpy and entropy, explain h-S diagram in detail. (6 marks)
- b) Explain the different modes of heat transfer. (6 marks)
3. a) Explain dry, wet and hair hygrometer. (6 marks)
- b) A ray of light is incident from glass on the interface separating it from air at an angle of  $40^\circ$  and is deviated through  $15^\circ$ , calculate the critical angle for glass-air interface. (6 marks)

4. a) Explain with neat diagram, construction and working of prism binocular. (6 marks)

b) Give the application of optical fibre in medical field. (6 marks)

5. a) State and prove the Bernoulli's equation for the liquid of flow. (6 marks)

b) Explain streamline flow and turbulent flow in liquids. (6 marks)

6. a) Derive the formula for rate of flow of the water in venturimeter. (6 marks)

b) With the help of neat sketch, explain the differential pulley and derive an expression for its efficiency. (6 marks)

7. a) How does a ship echo sounder work? (6 marks)

b) Discuss the Characteristics of sound. (6 marks)

8. a) Define Viscosity, viscous flow and Reynolds number. (6 marks)

b) For cylindrical pipes, Reynolds number is nearly 2000. If the diameter of a pipe is 2 cm and water flows through it, determine the velocity of the flow. Take  $\eta$  for water =  $10^{-3} \text{ N s m}^{-2}$  (6 marks)

9. a) Give the difference between hard and soft magnetic material. (6 marks)

b) Explain Gyro compass in detail. (6 marks)

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