

INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)
END SEMESTER EXAMINATION DEC-2017

Programme: DNS

Subject Name: Applied sciences

Date: 05.12.2017

Time: 2 Hours

Semester: I

Subject code: UD11T3102

Maximum marks: 70

Pass marks:35

Part –A (Physics)

Answer any 4 from the following

(4×10=40)

1. a) Explain the term "Gyro inertia". (5)
- b) A thin metal ring of diameter 0.6 m and mass 1kg starts from rest and rolls down on an inclined plane. its linear velocity on reaching the foot of the plane is 5 ms^{-1} . calculate the 1)moment of inertia of the ring 2)K.E of rotation at that instant. (5)
2. a) Derive the relationship between Celsius, kelvin and Fahrenheit scale (5)
- b) Explain Anomalous expansion of water. (5)
3. a) Explain Damped oscillations and undamped oscillations. (5)
- b) Write the equation of a simple harmonic motion with an amplitude of 5 cm if 150 oscillations are performed in one minute and the initial phase is 45° (5)
4. a) How does a ship echo sounder work? (5)
- b) An automobile moving at 30 m/s is approaching a factory whistle that has a frequency 500 Hz. if the speed of sound is 340 m/s, find the apparent frequency of the whistle as heard by the driver. (5)
5. a) Explain with neat diagram, the propagation of light in optical fibre. (5)
- b) Explain with neat diagram, construction and working of sextant. (5)

Part-B (Electricity)

Answer any two from the following

(2×10=20)

6. a) Define Electric Current and Voltage. (5)
b) Define Power and Energy. (5)
7. a) If a coil of 150 turns is linked with a flux of 0.01 wb when carrying a current of 1 A, calculate the inductance of coil. Now, if current is uniformly reversed in 0.1 sec, calculate the induced emf. (5)
b) Explain the working principle of DC generator. (5)
8. a) List the various types of electric cables used in onboard ship. (5)
b) State the hazards associated with static electricity. (5)

Part-C (Electronics)

Answer any one from the following

(1×10=10)

9. a) Explain with block diagram, the working principle of super heterodyne receiver. (5)
b) Write a short notes on Ionosphere and its layer. (5)
10. Explain with block diagram, the working principle of RADAR transmitter and receiver. (10)
