

INDIAN MARITIME UNIVERSITY
(A Central University, Govt. of India)
May/June 2018 End Semester Examinations
DNS (Diploma in Nautical Science)
Semester I
Applied Science(UD11T3102)

Date:05.06.2018

Max. Marks: 70

Time: 2 Hrs

Pass Marks: 35

SECTION -A (Physics)

Answer any Four Out of Five Questions.All Questions carry equal marks.

1. a) Explain the term "Precession" in gyroscope. (5 marks)
b) A constant retarding force of 60 N is applied to a body of mass 30 kg moving initially with a speed of 18 m/s. How long does the body take to stop. (5 marks)
2. a) Explain why water has its minimum volume and maximum density at 4°C. (5 marks)
b) How much heat is gained by 60 g of mercury when its temperature rises from 27°C to 60°C. The specific heat capacity of mercury is 1.39 J/g°C. (5 marks)
3. a) Explain Damped and undamped oscillations. (5 marks)
b) An harmonic oscillation is represented by $y=0.26 \sin(4000t+\pi/6)$ Determine amplitude, frequency, angular frequency, time period, initial phase. (5 marks)
4. a) Discuss the characteristics of sound. (5 marks)
b) The intensity of sound in normal conversation at home is about $3 \times 10^{-6} \text{ W/m}^2$ and the frequency of normal human voice is about 1000 Hz. Find the amplitude of the waves assuming that the air has a density 1.29 kg/m^3 and velocity of sound in air is 332.5 m/s (5 marks)
5. a) Explain with neat diagram, construction and working of prism binocular. (5 marks)

b) Monochromatic light of wavelength 600 nm is incident from air on a glass surface. What are the wavelength, frequency and speed of the refracted light? (μ of glass 1.5) (5 marks)

SECTION-B (Electricity & Electronics)

Answer any three out of given four questions. All questions carry equal marks

6. a) Explain heating effect of electric current. (5 marks)

b) Two capacitors $C_1=3\mu\text{F}$ and $C_2 =6 \mu\text{F}$ are in series across 90V DC supply. Show a circuit and calculate the charges on C_1 and C_2 and potential difference across each. (5 marks)

7. a) Explain Principle, construction and working of AC generator.(5marks)

b) Magnetic field through a coil having 200 turns and cross sectional area 0.04 m^2 changes from 0.1 wbm^{-2} to 0.04 wbm^{-2} in 0.02 seconds.find the induced emf. (5 marks)

8. a) Explain with block diagram, the working of RADAR. (5 marks)

b) Define self and mutual induction. (5 marks)

9. Write short notes on any Two, with diagrams (if necessary)
(5 Marks x 2=10)

a) Yagi uda antenna.

b) Transducers.

c) Working of radio transmitter with block diagram.
