

COMMON TO ALL BRANCHES
FIRST SEMESTER
PH 9111 - ENGINEERING PHYSICS
(REGULATIONS 2008)

Time: 3 hr

(Max. Mark: 100)

Answer ALL Questions
Part - A (10 × 2 = 20 Mark)

1. Write a short note on 'I'-shape girders.
2. Calculate the force to produce extension of 2 mm in a wire of length 3 m and of radius 1 mm. Young's modulus of the wire is 2.00×10^{11} N/m².
3. State Weber - Fechner law.
4. Calculate the natural frequency of 5.0 cm length of a copper rod fixed at its centre. The Young modulus of the copper is 1.20×10^{11} N/m² and the density is 8960 kg/m³.
5. Define the coefficient of thermal conductivity.
6. Calculate the efficiency of carnot engine operating between the temperatures of steam and ice.
7. Two separate monochromatic sources act like coherent sources.
8. A wedge shaped thin film of refractive index is 1.4. Calculate the angle of the wedge if the wavelength of light is 450 nm and width of the fringes is 0.28 mm.
9. What are Bravais lattice?
10. Draw the Miller planes for (1 1 0), (3 1 1).

Part - B (5 × 16 = 80 Mark)

11. (a) Calculate the packing fraction of SC, BCC, FCC and HCP.
12. (a) Derive the expression for the Young's modulus of a cantilever beam and explain the experiment to determine the Young's modulus of a cantilever beam.
(OR)
(b) Explain experiment with theory to find out the rigidity modulus of a wire using torsion pendulum.
13. (a) Obtain Sabine's expression for reverberation in a hall.
(OR)
(b) Explain with neat diagram, principle, construction, working of piezoelectric method to produce ultrasonics.

(P.T.O.)

14. (a) Describe the Forbe's method to determine the coefficient of thermal conductivity of good conductor.

(OR)

(b) Explain the Otto engine cycle with neat diagram and calculate the efficiency.

15. (a) Explain the construction of Michaelson interferometer, types of fringes and its uses.

(OR)

(b) Describe the construction, working and uses of CO_2 laser.