

B.Tech I Year(RR) Supplementary Examinations, May 2010
ENGINEERING PHYSICS

(Common to Civil Engineering and Mechanical Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Describe the interference pattern obtained due to superposition of coherent sources.
(b) Derive an expression for the distance between two successive bright fringes formed in Young's experiment.
(c) In a double slit experiment a light of $\lambda = 5460$ A.U. is exposed to slits which are 0.1 mm apart. The screen is placed 2 m away from the slits. What is the angular position of the 10th maximum and 1st minimum? [6+6+4]
2. (a) What is meant by diffraction of light? Explain it on the basis of Huygen's wave theory.
(b) What are the types of diffraction and give the difference between them.
(c) What is the difference between Interference and Diffraction? [6+6+4]
3. (a) Distinguish between polarized and unpolarized lights.
(b) What is Brewster's law? Explain how this can be used to find the polarizing angles of various crystals.
(c) Find the Brewster angle for a glass slab ($\mu = 1.5$) immersed in water ($\mu = 4/3$). [6+6+4]
4. (a) With necessary theory and energy level diagram, explain the working of a Helium-Neon gas laser.
(b) Mention some important applications of lasers. [10+6]
5. (a) Explain thermal expansion using the graph between potential energy and interatomic distance.
(b) Discuss the variation of thermal conductivity of a solid with temperature.
(c) Why the thermal conductivity of alloys is lower than that of the pure constituents? Explain. [8+4+4]
6. (a) How are the dielectric materials classified?
(b) Write short notes on "Porcelain". [10+6]
7. (a) Explain the phenomenon of spontaneous magnetization in magnetic materials.
(b) Discuss the characteristic features of ferromagnetic materials. [6+10]
8. (a) Why are the air pressure vessels required in aerospace?
(b) Explain the various properties of the materials used for air pressure vessels along with their salient feature.
(c) Why is the magnesium alloy not used for the air pressure vessels? [6+8+2]
