

AUGUST 2006

2006 MAHATMA GANDI UNIVERSITY
B.TECH DEGREE EXAMINATIONS
II SEMESTER ELECTRICAL AND ELECTRONICS ENGINEERING
ENGINEERING PHYSICS

TIME : 3 HOUR
MARK : 100

ANSWER ALL QUESTIONS

EACH QUESTION CARRIES 4 MARKS. (10 X 4 = 40 MARKS)

1. Explain the terms (a) Population inversion and (b) Metastable state.
2. Write a short note on semiconductor laser.
3. What is isotopic effect on superconductors?
4. Briefly explain any four applications of superconductors.
5. What are different crystal systems?
6. Define Packing factor. Calculate the packing factor for body-centred cube.
7. Define Magnetic permeability and Susceptibility. Obtain the relation between them.
8. How are dielectric materials classified?
9. With a neat diagram, explain the structure of an optical fibre.
10. Explain any four advantages of Optical fibre over the conventional cables.

EACH QUESTION CARRIES 12 MARKS. (5 X 12 = 60 MARKS)

11. (a) Describe the construction and working of an electron microscope.
Or
(b) Describe the construction and working of He-Ne laser.
12. (a) What are type I and type II superconductors? Explain B.C.S. with the key note of Cooper pairs.
Or
(b) What is SQUID ? Explain its working. Explain Josephson effect.
13. (a) What do you mean by Miller indices? Give their role in crystal structure. Calculate the separation between lattice planes in face-centred cubic lattice.
Or
(b) Give the theory of Bragg's X-ray diffraction. Describe Bragg's X-ray spectrometer. How it is used to verify Bragg's law?
14. (a) How do you distinguish between Diamagnetic, Paramagnetic and Ferromagnetic materials?
Or
(b) What is piezoelectric effect? With necessary circuit diagram, explain the production of ultrasonics using Piezoelectric crystal.
15. (a) Explain with necessary theory, the propagation of light in optical fibres. Derive the expression for numerical aperture.
Or
(b) Describe various types of optical fibres. Explain optical fibre sensors.