



I Fill in the Blanks

(10x1=10)

- 1 What is Zeeman effect?
- 2 What are high temperature superconductors?
- 3 Give two examples for Type I superconductors.
- 4 What are coherent sources?
- 5 Define bandwidth of an interference pattern.
- 6 What is the difference between laser and maser?
- 7 Quantum dots are dimensional nanomaterials.
- 8 Carbon nanotubes are obtained by rolling sheets.
- 9 What is meant by pumping in a laser device?
- 10 Define numerical aperture of an optic fibre.

II Write Short notes on any FIVE of the following

(5x2=10)

- 1 Write a note on squids.
- 2 Give any two advantages of optical fibre communication.
- 3 What is the role of He atoms in He-Ne laser?
- 4 Give any two advantages of using nanoparticles in drug delivery .
- 5 What are stokes and antistokes lines?
- 6 Distinguish between spontaneous and stimulated emission.
- 7 What do you mean by donor and acceptor levels in semiconductors?

III Answer any FIVE of the following.

(5x4=20)

- 1 Explain colours of thin films.
- 2 Explain the principle of optical fibre.
- 3 What is Meissner effect? Prove that superconductor is a perfect diamagnet.
- 4 Calculate the numerical aperture, maximum acceptance angle and the critical angle of optical fibre having a core of refractive index 1.5 and cladding of refractive index 1.45 when placed in air.
- 5 Establish the relation between Einstein's A and B coefficients.
- 6 Explain recording of a hologram.
- 7 Compare diamagnetic and paramagnetic materials.

IV Write an essay on any ONE of the following

(1x10=10)

- 1 Explain band theory of solids. Based on this theory how solids are classified into solids, insulators and semiconductors.
- 2 With neat diagrams explain the construction and working of Ruby laser.
