ANNA UNIVERSITY OF TECHNOLOGY, COIMBATORE

B.E. / B.TECH. DEGREE EXAMINATIONS : DEC 10 / JAN 11

REGULATIONS : 2008

FIRST SEMESTER

080040001 - ENGINEERING PHYSICS I

(COMMON TO ALL BRANCHES)

TIME : 3 Hours **Max.Marks : 100**

PART – A

(20 x 2 = 40 Marks)

ANSWER ALL QUESTIONS

1. What is cavitation in ultrasonics?
2. State the magnetostriction principle
3. Define A-scan display in ultrasonics.
4. Write any four properties of ultrasonic waves.
5. Define "holography"
6. Mention the different types of pumping methods in Lasers.
7. Distinguish between spontaneous emission and stimulated emission.
8. State any four properties of laser.
9. Calculate Numerical Aperture and angle of acceptance of a fibre if the refractive index of the core is 1.55 and that of cladding is 1.5.
10. State any two differences between step index fibre and graded index fibre
11. How do you differentiate single mode from multimode fibre?
12. What do you mean by splicing of optical fibres?
13. Calculate deBroglie wavelength of an electron accelerated to a potential of 100Volts.

14. Find the lowest energy of an electron confined in a box of length 0.2 nm.
15. Write the physical significance of wave function.
16. State Wien's displacement law.
17. Define unit cell.
18. What are Miller indices?
19. What is edge dislocation?
20. List out the differences between Frenkel defect and Schottky defect.

PART – B

(5 x 12 = 60 MARKS)

ANSWER ANY FIVE QUESTIONS

21. Explain how ultrasonic waves can be produced by piezo electric method.
22. Describe the construction and working of CO_2 laser with the necessary diagrams.
23. (i) Derive an expression for numerical aperature and acceptance angle of an optical fibre. (6)

    (ii) Describe the double crucible technique for the preparation of optical fibre. (6)
24. Explain in detail any three types of light sources used in optical fibres.
25. Discuss in detail, the applications of Schrodinger's wave equation with particular reference to a particle in one dimensional box.
26. Explain the principle and working of transmission electron microscope and list out its limitations.
27. Prove that $c/a = \sqrt{\frac{8}{3}}$ for hcp structure and hence deduce the packing factor.
28. Calculate the packing factor for SC and BCC crystal structures. (5 + 7)

*****THE END*****