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Question Paper Code: 11003

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2014.

First Semester

Civil Engineering

01UPH103 - ENGINEERING PHYSICS

(Common to all branches)

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. Mention any two merits and demerits of Piezo electric oscillator.
2. Ultrasound cannot be produced by loudspeakers. Why?
3. The wavelength of light emitted by InP laser is $1.50 \mu\text{m}$. What is its band gap in eV?
4. Define optical pumping.
5. The refractive index of core and cladding are 1.60 and 1.50 respectively. Calculate the critical angle at core-cladding interface.
6. What is splicing? Mention its types.
7. State Planck's hypothesis on black body radiation.
8. What is meant by degenerate and non-degenerate states?
9. Define space lattice and lattice points.
10. Mention any two differences between edge and screw dislocation.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Draw the circuit diagram of magnetostriction oscillator and explain the construction and generation of ultrasonics. (12)
- (ii) Write down any four properties of ultrasonic waves. (4)

Or

- (b) (i) Explain with neat diagram the working of ultra sonogram. (10)
- (ii) Write a note on cavitation. (6)
12. (a) (i) Describe the construction and working of hetero junction laser with neat diagram. (10)
- (ii) Write a note on heat treatment of laser. (6)

Or

- (b) (i) Derive the expression for existence of stimulated emission through Einstein's coefficients. (10)
- (ii) Explain the action of holographic recording technique. (6)
13. (a) (i) Write a note on any 3 types of photo detectors. (8)
- (ii) Derive an expression for critical angle, acceptance angle and numerical aperture of optical fibers. (8)

Or

- (b) (i) With neat diagram explain the fabrication of optical fiber by crucible-crucible method. (8)
- (ii) Discuss the advantages of optical fibre communication over conventional metallic type wire communication. (8)
14. (a) (i) Derive an expression for Schrodinger time independent wave equation. (12)
- (ii) State the physical significance of wave function. (4)

Or

- (b) (i) With neat diagram discuss the action of a Scanning Electron Microscope. (12)
- (ii) An electron is trapped in a one dimensional box of length 0.1 nm. Calculate the energy required to excite the electron from its ground state to fifth excited state. (4)
15. (a) (i) Deduce the atomic packing factor of FCC crystal with neat diagram. (12)
- (ii) Derive an expression for calculation of lattice constant. (4)

Or

- (b) (i) Discuss HCP structure in detail with neat diagram and hence deduce atomic packing factor by deducing c/a ratio. (12)
- (ii) Write a note on point defects. (4)
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