Reg. No. : | | | | | | | | | | |

Question Paper Code: 41103

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

First Semester

Civil Engineering

14UPH103 – ENGINEERING PHYSICS

(Common to all branches)

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 1 = 10 Marks)

1. Ultra sonics are sound waves having frequency.
   (a) Less than 20 Hz (b) Greater than 20000 Hz
   (c) Between 20 Hz and 20000 Hz (d) Greater than 20 Hz

2. Two dimensional scanning method is also known as
   (a) A- scan (b) B- scan (c) C- scan (d) none

3. The method of achieving population inversion in Nd:YAG laser is
   (a) Electrical discharge (b) Direct electrical conversion
   (c) Inelastic collision (d) Optical pumping

4. Laser beam is highly
   (a) coherent (b) incoherent (c) scattering (d) diffraction

5. The principle of propagation of light through optical fibre is
   (a) Total Internal Reflection (b) Refraction
   (c) Diffraction (d) Reflection

6. In an optical fibre, the inner core is _____ the cladding

(a) denser than (b) less denser than
(c) the same density as (d) 2 times denser than

7. In Compton scattering, at what angle of scattering, the wavelength of the scattered photon will be maximum

(a) 0^0 (b) 90^0 (c) 180^0 (d) 120^0

8. In electron microscope the focussing effect is due to

(a) Lens (b) Electromagnetic field
(c) Prism (d) Aperture

9. The co-ordination number of BCC structure is

(a) 6 (b) 8 (c) 12 (d) 16

10. The two dimensional crystal defects are called

(a) Line defect (b) Point defect
(c) Surface defect (d) Volume defect

PART - B (5 x 2 = 10 Marks)

11. What is cavitation?

12. Explain the term population inversion.

13. What is meant by fibre optic sensor?

14. What are degenerate energy levels?

15. What are Bravais lattices?

PART - C (5 x 16 = 80 Marks)

16. (a) (i) With neat circuit diagram, explain the production of ultrasonics by Piezo electric oscillator. (12)

(ii) State the principle of SONAR. (4)

Or

(b) (i) Discuss the action of A and B scan in detail. (8)

(ii) Describe the action of ultra sonogram with neat diagram. (8)

17. (a) Describe the construction and working of Nd: YAG laser with suitable energy level diagram. (16)

Or

(b) Describe the method of construction and reconstruction of images using holography. (16)

18. (a) (i) Derive an expression for acceptance angle and numerical aperture in optical fiber. (10)

(ii) Write a note on different losses in optical fiber. (6)

Or

(b) (i) With neat diagram explain the fabrication of optical fiber by double - crucible method. (10)

(ii) Explain the action of temperature sensor. (6)

19. (a) Derive planks law of radiation and hence deduce Wien's displacement law and Rayleigh Jeans law. (16)

Or

(b) Write the principle, working, advantages, disadvantages and applications of scanning electron microscope. (16)

20. (a) (i) Derive the relation between inter planer distance and lattice constant in terms of miller indices. (10)

(ii) Show the Atomic Packing factor for FCC is 74%. (6)

Or

(b) Discuss different types of crystal defects in detail. (16)

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