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 **Reg. No. :**

**Question Paper Code: 41003**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

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. | SONAR stands for | CO1- R |
|  | (a) Sound Noise and Reduction  | (b) Sound Navigation and Reduction  |
|  | (c) Sound Navigation and Ranging  | (d) Sound Noise and Ranging |
| 2. | Two dimensional scanning method is also known as | CO1- R |
|  | (a) A- scan  | (b) B- scan  | (c) C- scan | (d) None |
| 3. | Laser beam is highly |  CO2- R |
|  | (a) Coherent  | (b) Incoherent  | (c) Scattering  | (d) Diffraction |
| 4. | The principle of semi conductor laser is |  CO2- R |
|  | (a) Forward biased  | (b) Reverse biased | (c) Energy of photons  | (d) None of these |
| 5. | Joining of two fibres is called as | CO3- R |
|  | (a) Welding  | (b) Soldering  | (c) Splicing | (d) Sensor |
| 6. | The loss of optical fibre power is  | CO3- R |
|  | (a) Attenuation  | (b) Dispersion  | (c) Absorption | (d) Reflection |
| 7. | │ ψ │2 is a measure of | CO4- R |
|  | (a) Probability density | (b)Wave function  | (c) Velocity  | (d)$ Frequency $ |
| 8. | In Compton scattering, at what angle of scattering, the wavelength of the scattered photon will be maximum | CO4- R |
|  | (a)$ 0$ | (b) 900 | (c) 1800 | (d) 1200 |
| 9. | The co-ordination number of BCC structure is | CO5- R |
|  | (a) 6  | (b) 8 | (c) 12 | (d) 16 |
| 10. | The primitives are equal and interfacial angles are equal to 900 is called | CO5- R |
|  | (a) Cubic | (b) Mono clinic  | (c) Tri clinic | (d) Hexagonal |
|  | PART – B (5 x 2= 10Marks) |
| 11. | Name the methods of detection of Ultrasonics. CO1- U |
| 12. | Explain the term population inversion. CO2- U |
| 13. | What is meant by fibre optic sensor? CO3- U |
| 14. | What are degenerate energy levels? CO4-U |
| 15. | Define the term unit cell. CO5- U |
|  | PART – C (5 x 16= 80 Marks) |
| 16. | (a) | (i) With neat circuit diagram, explain the production of ultrasonics by Piezo electric oscillator.  | CO1- U |  (12) |
|  |  | (ii)State the principle of SONAR. | CO1- U |  (4) |
|  |  | Or |  |  |
|  | (b) | (i) Determine the velocity of ultrasonic waves by acoustical  grating method.   | CO1- U |  (12)  |
|  |  | (ii) Mention some medical applications of ultrasonics.  | CO1- U |  (4) |
|  |  |  |  |   |
| 17. | (a) | (i) Discuss the construction and working of the Homo Junction  Semiconductor Laser.  | CO2- U |  (10) |
|  |  | (ii) What is Holography? Explain the construction and  reconstruction of a Hologram. | CO2- U |  (6) |
|  |  | Or |  |  |
|  | (b) | Describe the construction and working of Nd: YAG laser with suitable energy level diagram.  | CO2- U |  (16) |
|  |  |  |  |  |
| 18. | (a) | Classify the optical fibers on the basis of Materials, Modes of propagation and Refractive Index difference.  | CO-3 Ana |  (16) |
|  |  | Or |  |  |
|  | (b) | How will you classify optical fibres based on materials, modes and refractive indices.  | CO3- Ana |  (16) |
|  |  |  |  |  |
| 19. | (a) | Derive planks law of radiation and hence deduce Wien’s displacement law and Rayleigh Jeans law.  | CO4-Ana |  (16) |
|  |  | Or |  |  |
|  | (b) | Deduce an expression for Compton wavelength.  | CO4- Ana |  (16) |
|  |  |  |  |  |
| 20. | (a) | Discuss different types of crystal defects in detail. | CO5-App |  (16) |
|  |  | Or |  |  |
|  | (b) |  (i) Show that d=$\frac{a}{ \sqrt{h^{2}+k^{2}+l^{2}}} $, where *d*- the inter planar distance,  *a* – interatomic distance and *h*, *k*, l are Miller indices of  parallel planes. | CO5-App |  (8) |
|  |  |  (ii) write a note on point defects and line defects. | CO5-App |  (8) |