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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) | | |
| 8. | In Compton scattering, at what angle of scattering, the wavelength of the scattered photon will be maximum | | | | | | CO4- R | | |
|  | (a) | | (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=, 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) |