

ANURAG Engineering College**(An Autonomous Institution)****I B.Tech II Semester Supplementary Examinations, June/July – 2024****ENGINEERING PHYSICS****COMMON TO CE, EEE & MECH****Time: 3 Hours****Max. Marks: 75****Section – A (Short Answer type questions)****(25 Marks)****Answer All Questions**

| | Course Outcome | B.T Level | Marks |
|---|-----------------------|------------------|--------------|
| 1. Conditions for simple harmonic motion. | CO1 | L2 | 2M |
| 2. What is resonance and give the condition of resonance in forced harmonic oscillator. | CO1 | L2 | 3M |
| 3. Deduce equation for wavelength of source from grating element | CO2 | L2 | 2M |
| 4. Explain the concept of polarization by double refraction? | CO2 | L2 | 3M |
| 5. Define snell's law and critical angle | CO3 | L1 | 2M |
| 6. Draw energy level diagram for Ruby laser | CO3 | L2 | 3M |
| 7. Define space lattice | CO4 | L1 | 2M |
| 8. Draw the crystal structure and lattice parameters for orthogonal crystal system. | CO4 | L2 | 3M |
| 9. Write the properties of anti-ferromagnetic materials. | CO5 | L1 | 2M |
| 10. Derive equation for local field. | CO5 | L2 | 3M |

Section B (Essay Questions)**Answer all questions, each question carries equal marks.****(5 X 10M = 50M)**

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|--|-----|----|-----|
| 11. A) Deduce the mathematical expression for a damped oscillator and explain different damping conditions. | CO1 | L2 | 10M |
| OR | | | |
| B) Derive an equation for the motion of a transverse wave? What are stationary waves give an example? | CO1 | L2 | 10M |
| 12. A) Define Huygen's principle, Superposition of waves and Coherence, Derive bright band with for Young's double slit experiment | CO2 | L3 | 10M |
| OR | | | |
| B) Mathematically evaluate that the brightness and bright fringe width changes with the order in Diffraction through single slit | CO2 | L3 | 10M |
| 13. A) Explain the different types optical fibers based on refractive index profile and number of modes in detail. | CO3 | L2 | 10M |
| OR | | | |
| B) What are the characteristics of the laser and Derive relation between Einstein coefficients relation. | CO3 | L2 | 10M |
| 14. A) Write detailed note on 7 crystal systems based on their symmetry properties. Calculate inter planar spacing of a cubic plane (111) with lattice constant $1.2A^\circ$. | CO4 | L3 | 10M |
| OR | | | |
| B) Define Bragg's law and Explain construction and working of Powder diffraction method. | CO4 | L3 | 10M |

15. A) Derive equation for origin of magnetic moment and Write detailed note on classification of magnetic materials based on magnetic moment. CO5 L2 10M

OR

B) Derive the relation between polarizability and dielectric constant and write a note on dielectrics applications CO5 L3 10M