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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech (CSE) (Sem.-1)
ENGINEERING PHYSICS
Subject Code : PH-101
Paper ID : [A0122]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A**Write briefly :**

1. What is the physical significance of divergence of a vector field?
2. State Ampere's circuital law in electromagnetism.
3. Explain briefly the physical significance of wave function.
4. Explain the term 'population inversion'.
5. Explain the term 'numerical aperture'.
6. What is Meissner effect?
7. What is Raman effect? Give its importance.
8. Why X-rays are used to study crystal structure?
9. Find the length of the meter stick moving length wise at a speed of $0.8c$.
10. What do you understand by coherence length and penetration depth in superconductors?

SECTION-B

11. a) What do you understand by electric displacement, susceptibility and permittivity.
b) Write Maxwell's equations and their importance.
12. a) Discuss the complete classification magnetic materials.
b) What are the differences between soft and hard magnetic materials?
13. a) Explain the terms spontaneous and stimulated emission.
b) Describe the construction and working of a Ruby laser with necessary diagram.
14. a) Differentiate between step index and graded index fibre. Explain material dispersion and pulse dispersion in optical fibres.
b) Give some applications of optical fibres.

SECTION-C

15. a) Write down the fundamental postulates of special theory of relativity. Derive an expression for the variation of mass with velocity.
b) Explain briefly Michelson-Morley experiment.
16. a) Differentiate between continuous and characteristic X-ray spectra. How is Bragg's law used in crystallography?
b) What is the importance of Moseley's law.
17. a) State Schrodinger's wave equation for a free particle in one dimensional closed box with infinitely hard walls. State the boundary conditions and solve it to obtain the eigen-values and eigen-functions.
b) Explain briefly uncertainty principle.
18. a) Differentiate between type I and type II superconductors and give their applications.
b) Give the BCS theory of superconductors.