Hall Ticket Number:

Code No.: 1113 S

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. I Year I-Semester (Supplementary) Examinations, May/June-2016

Engineering Physics-I

Time: 3 hours Max. Marks: **50**

*Note: Answer ALL questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (15 Marks)

1. Define quality factor. [1]
2. What is displacement current? [1]
3. What is coherence? [1]
4. Pumping mechanism in ruby laser is through [1]
   a) Direct conversion b) Optical pumping c) chemical reaction d) Atomic collision
5. Does electronic polarization depend on temperature? Yes or No. [1]
6. If the quality factor of an undamped tuning fork of frequency 256Hz is 10^3. Calculate relaxation time. [2]
7. What is Poynting vector? Draw figure. [2]
8. Polarizer and analyzer are oriented so that the maximum amount of light is transmitted. To what fraction of its maximum value is the intensity of transmitted light reduced when analyzer is rotated through 30^0? [2]
9. Calculate the Numerical Aperture of an optical fiber which has core refractive index of 1.55 and a cladding refractive index of 1.44. [2]
10. Write the applications of ferrites. [2]

Part-B (5 X 7=35 Marks)

11. a) Explain the combination of two mutually perpendicular simple harmonic vibrations of same frequency. [3]
    b) Derive an equation for a damped harmonic oscillator and solve it. [4]

12. a) Derive the electromagnetic wave equations in free space. [3]
    b) Explain the Resonance frequency and bandwidth in series LCR circuit. [4]

13. a) Explain the interference in thin films due to reflection of light and obtain the conditions for maxima and minima. [3]
    b) Describe the Fraunhofer's diffraction at single slit and obtain the expression for its intensity. [4]

14. a) Describe how holograms can be recorded and reconstructed. [3]
    b) Explain the propagation of light through an optical fiber and derive the expression for its Numerical aperture. [4]

15. a) Distinguish between soft and hard magnetic materials. [3]
    b) Explain the frequency and temperature dependence on polarization processes. [4]

16. a) What is torsional pendulum and deduce the expression for its time period? [3]
    b) Write the Maxwell's equations in differential and integral forms. [4]

17. Write short notes on any **two** of the following: [7]
    a) Half wave and Quarter wave plates.
    b) Helium-Neon laser.
    c) Ferro electric materials.

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