Hall Ticket Number:

Code No.: 11003 O3

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. I Year I Semester Supplementary Examinations, June-2017

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. Write the differential equation for a simple harmonic oscillator. [1]
2. What is impedance? [1]
3. Write Malus law. [1]
4. What are the actual lasing atoms in He-Ne laser? [1]
5. Mention any two applications of Ferrites. [1]
6. The amplitude of a damped oscillator has reduced to $1/5^{th}$ of its initial value after 300 oscillations. Calculate the damping constant if time period is 3 seconds. [2]
7. What is Poynting vector? [2]
8. In Newton rings experiment the diameter of 10 the ring changes from 1.40 to 1.27 cm, when a drop of liquid is introduced between the lens and glass plate. Calculate the refractive index of the liquid. [2]
9. Calculate the Numerical Aperture of an optical fiber which has core refractive index of 1.60 and a cladding refractive index of 1.54 and acceptance angle. [2]
10. What are ferrites? [2]

Part-B (5 × 7 = 35 Marks)

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

12. a) Derive the electromagnetic wave equations in conducting medium. [3]
    b) Explain the LCR parallel resonance circuit and the concept of bandwidth. [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 double slit and obtain the expression for its intensity. [4]

14. a) Explain the basic principles of holography and discuss its applications. [3]
    b) Explain the propagation of light through an optical fibre and deduce the expression for the Numerical Aperture. [4]

15. a) Explain the Hysteresis curve based on domain theory. [3]
    b) Explain the temperature and frequency dependency of dielectric polarisations. [4]

16. a) Obtain the expression for the equation of motion of a simple harmonic oscillator. [3]
    b) Distinguish conduction and displacement currents. [4]

17. Write short notes on any *two* of the following: [7]
    a) Laurents's half shade polarimeter.
    b) Ruby Laser.
    c) Weiss theory of ferromagnetism.

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