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Code No. : 1103S

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. I Year I - Semester (Supplementary) Examinations, July/Aug - 2015

Engineering Physics - I

Time: 3 hours

Max. Marks: 70

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

Part-A (10 X 2=20 Marks)

1. An under damped oscillator has its amplitude reduced to $1/10^{\text{th}}$ of its initial value after 100 oscillations. If the time period is 2 seconds, calculate the damping constant. (2)
2. What are Lissajous figures? (2)
3. Explain the terms reactance and impedance in LR circuit. (2)
4. Write a note on displacement current. (2)
5. When a ray reflected at a surface backed by a denser medium suffers an abrupt phase change, equal to
a. $\pi/2$ b. $\pi/4$ c. $\pi/6$ d. π (2)
6. A parallel beam of sodium light is allowed to be incident normally on a plane transmission grating having 5000 lines per inch and a second order spectral line is observed deviated through 45° . Calculate the wavelength of the spectral line (2)
7. What are the basic characteristics of a laser. (2)
8. Mention few applications of Holography? (2)
9. What are Ferrites? Give examples. (2)
10. Outline the temperature dependence of dielectric polarization. (2)

Part-B (Marks: 50)

11. a) Describe the method to determine Rigidity modulus of a wire using Torsional pendulum (5)
b) Derive differential equation of Forced Harmonic oscillator and solve for its solution. (5)
12. a) State and explain Maxwell's equations in differential form. (5)
b) Derive an expression for resonating frequency and impedance of LCR parallel circuit. (5)
13. a) Discuss Newton's rings experiment to determine the refractive index of water. (5)
b) Describe the construction and working of Nicol's prism. (5)
14. a) Define the term population inversion. Describe the design and construction of Ruby laser. (5)
b) What is a hologram? Explain the construction and reconstruction of a Hologram. (5)
15. a) Discuss Hysteresis curve using domain theory Ferromagnetism. (5)
b) What is ionic polarization? Derive the expression for ionic polarizability. (5)
16. a) Determine the wavelength of a incident light using diffraction grating. (5)
b) Describe the propagation of light through an optical fiber. (5)
17. a) Derive an EM wave equation in free space. (5)
b) Write a note on ferroelectric materials and mention few applications. (5)
