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VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (CBCS) I-Semester Supplementary Examinations, June-2017

Engineering Physics

(Common to all branches)

Time: **3** hours Max. Marks: **70**

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

Part-A (10 × 2 = 20 Marks)

1. Distinguish between damped oscillations and forced oscillations.
2. Write a note on amplitude resonance.
3. If Newton's rings are observed in the transmitted light what is the color of central ring.
4. Define diffraction of light.
5. Find numerical aperture and acceptance angle of an optical fiber (in air) when refractive index of core and cladding are 1.45 and 1.44 respectively.
6. Write two important applications of optical fiber.
7. Mention two important differences between ordinary photography and Holography.
8. In He-Ne laser what is the role of Helium gas and what is the role of Neon gas?
9. What do you mean by polar and nonpolar molecules? Give example for each.
10. Define the terms retentivity and coercivity.

Part-B (5 × 10 = 50 Marks)

11. a) Define Simple harmonic oscillation. Derive differential equation and solve for its solution. [7]
    b) The amplitude of a damped harmonic oscillator reduces from 20 to 2 cm after 100 oscillations, each of period 2.3 sec. Calculate logarithmic decrement of the system. [3]

12. a) Derive an equation for diameter of n^{th} dark ring in newton rings experiment. [7]
    b) Calculate the thickness of a quarter wave plate of quartz for sodium light of wavelength 589.3 nm. The refractive indices of quartz for e-ray and o-ray are 1.5533 and 1.5442. [3]

13. a) What are different types of optical fibers? [5]
    b) With a block diagram explain the optical fiber optics communication system. [5]

14. a) Discuss with suitable diagrams the principle, construction and working of He-Ne laser. [7]
    b) Explain the construction and re-construction of image on hologram in brief. [3]

15. a) Define electronic polarizability and derive an expression for it. [6]
    b) Distinguish between soft and hard magnetic materials. [4]

16. a) Explain in brief the superposition of two SHMs and formation of lissajous figures. [7]
    b) Light of wavelength 5500 A.U. fall normally on a slit of width 22×10^{-7} m. Calculate the angular position of first two minima on either side of central maxima. [3]

17. Write short notes on any **two** of the following:
    a) Single and Multi Mode Fibers. [5]
    b) Applications of lasers and laser safety. [5]
    c) Ferrites. [5]

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