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Code No. : 11013

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. (CBCS) I-Semester Main Examinations, December-2017

Engineering Physics
(Common to all branches)

Time: 3 hours

Max. Marks: 60

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

Part-A (10 × 2 = 20 Marks)

1. A 0.3 kg mass hangs from a spring. A 300 gm body hung below the mass stretches spring 2.0 cm. farther. If the 300 gm body is removed and the mass set into oscillation. Find the amplitude and period of motion.
2. Define Logarithmic decrement and Relaxation time.
3. Mention two important differences between double slit interference pattern and double slit diffraction pattern.
4. A sugar solution with 10gm/100cc concentration is used to find out the specific rotation. When the concentration of solution is increased to 20gm/100cc, how specific rotation changes?
5. Mention any four applications of optical fibers.
6. In an optical fiber whose refractive index should be more? Core or Clad? Why?
7. Why is population inversion necessary between two energy level for lasing action to occur?
8. Mention two important differences between ordinary photography and Holography.
9. What do you understand by RMS and average values of a.c. voltage?
10. Differentiate between conduction current and displacement current.

Part-B (5 × 8 = 40 Marks)

11. a) Form the equation of damped harmonic oscillator and obtain its solution. Discuss it for under damping. [6]
b) The amplitude of a second pendulum falls to half initial value in 50 sec. calculate the Q-factor.(for second pendulum T=2 sec) [2]
12. a) Draw a neat diagram and explain how newton's rings will help us to find out the wavelength of a given monochromatic source. [6]
b) A half wave- plate is fabricate for a wavelength of 380nm.For what wavelength does it work as a quarter-wave plate. [2]
13. a) With the help of neat diagrams explain step index, graded index, single mode and multi-mode fibers. [6]
b) Find the numerical aperture and acceptance angle of a fiber of core index 1.4 and $\Delta=0.02$ [2]
14. a) Describe the construction and working of He-Ne laser. [6]
b) Give important medical applications of holography. [2]
15. a) Show that a plane electromagnetic wave travelling in free space is transverse in nature. [6]
b) Can electromagnetic wave propagates through vacuum? If yes what is its velocity in vacuum? [2]
16. a) What are Lissajous figures and discuss the superposition of SHMs of same frequency? [4]
b) Explain the construction working of Laurent's Half Shade Polarimeter. [4]
17. Answer any *two* of the following:
a) Write a short note on different losses in optical fibers. [4]
b) What is LIDAR? [4]
c) State Maxwell equations in integral and differential form. [4]

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