[EPH-101]
B.Tech. Degree Examination
BT, Civil, CSE, ECE, EEE, EIE, IT, ME, IE & AE
I SEMESTER
ENGINEERING PHYSICS
(Effective from the admitted batch 2015–16)

Time: 3 Hours
Max.Marks: 60

Instructions:
Each Module carries 12 marks.
Answer all modules choosing one question from each module.
All parts of the module must be answered in one place only.
Figures in the right hand margin indicate marks allotted.

MODULE-I
1. a) Discuss the formation of interference fringes in a thin Wedge-shaped film. Obtain an expression for fringe width 10
   b) In Newton’s rings arrangement, the diameter of 10th dark ring changes from 1.5cm to 1.27cm when a liquid is introduced between the lens and the glass plate. Calculate the refractive index of the liquid 2

   OR

2. a) Define dispersive power of diffraction grating and also derive an expression for it. On what factors does it depend? 6
   b) Discuss Fraun-hoffer diffraction pattern due to a single slit. Find the expression for the width of the central maximum 6

MODULE-II
3. a) Describe the construction and working of a Nicol Prism and show how it can be used as a polarizer as well as analyser 10
   b) What is the difference between negative and positive crystals? 2

4. a) What is a polarized light? How will you produce and detect plane, circular and elliptically polarized lights? 10
   b) Calculate the thickness of a quarter wave plate (QWP) of quartz for sodium light of wavelength 5893Å. The ordinary and extraordinary refractive indices of sodium are 1.54425 and 1.55336 2

MODULE-III
5. a) Describe the construction and working of a He-Ne laser with the relevant energy level diagram 10
   b) What are the components required to build a laser? 2

   OR

6. a) Explain the basic principle of confining light in a step index fiber and hence obtain an expression for the critical angle and acceptance angle 8
   b) List out any four merits of optical fiber communication 4

MODULE-IV
7. a) Obtain the Eigen value and Eigen function for a particle trapped in a one dimensional potential well of infinite height 10
   b) What do you mean by a “well-behaved” wave function? 2

   OR

8. a) How did the work of Davisson and Gerner help confirm the wave nature of electrons? 10
   b) What are fermions? 2

MODULE-V
9. a) What is inverse piezo-electric effect? How this idea has been exploited for the generation of ultrasonics in a piezo electric oscillator 8
   b) Explain how ultrasonic waves are detected by sensitive flame method 4

   OR

10. a) Derive the equation of continuity. What does it represent? 8
    b) What is the divergence of a vector field? What does it mean if the divergence of a vector field is zero; positive or negative 4