14PH 102
PH 112

Hall Ticket Number:

I/IV B.Tech (Supplementary) DEGREE EXAMINATION

November, 2019 — **Common to all branches**

First Semester — **Engineering Physics -I**

Time: Three Hours — **Maximum:** 60 Marks

Answer Question No.1 compulsorily. (1X12 = 12 Marks)
Answer ONE question from each unit. (4X12=48 Marks)

1. Answer all questions (1X12=12 Marks)
   a) What is coherence?
   b) What is meant by resolving power of a grating?
   c) State Brewster's law.
   d) Write the characteristics of a laser.
   e) Write any two advantages of optical fibers.
   f) State the principle involved in Hologram.
   g) What is the role of resistance in LCR circuit?
   h) State Hall effect.
   i) Give the expression for velocity of Electro-magnetic wave.
   j) What is meant by dual nature of light?
   k) What is normalised wave function?
   l) If an electron is accelerated to a potential of 100V. Find its wavelength.

UNIT I

2. a) Describe Michelson interferometer and explain the formation of fringes in it. 8M
   b) Distinguish between Fresnel and Fraunhofer diffraction. 4M

(OR)

3. a) What do you understand by double refraction? Explain Huygen's theory of double refraction in a uniaxial crystal. 8M
   b) Calculate the thickness of the quarter wave plate when the wavelength of the light is equal to $5890A^0$ and $\mu_0 = 1.55$ and $\mu_e = 1.54$. 4M

UNIT II

4. a) With a neat diagram explain the construction and working of a Ruby laser. 6M
   b) Explain how a hologram is recorded and reproduced? 6M

(OR)

5. a) Distinguish between spontaneous emission and stimulated emission. 4M
   b) Derive the expression for numerical aperture of an optical fiber. 8M

UNIT III

6. a) Explain the construction and working of a cyclotron. 8M
   b) Write Maxwell's equations in differential and integral forms. 4M

(OR)

7. a) State and explain Gauss law in magnetism. 4M
   b) Derive the expression for frequency in case of AC circuit containing series LCR circuit. 8M

UNIT IV

8. a) Explain how Davison-Germer experiment supports the dual nature of light. 6M
   b) Using Heisenberg's uncertainty principle, prove that electrons are not exists inside the nucleus. 6M

(OR)

9. a) Write the physical significance of wave function. 4M
   b) With a neat diagram explain the working of scanning tunnelling microscope. 8M