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I/IV B.Tech (Supplementary) DEGREE EXAMINATION**November, 2019****First Semester****Time:** Three Hours**Common to all branches****Engineering Physics -I****Maximum:** 60 Marks*Answer Question No.1 compulsorily.*

(1X12 = 12 Marks)

Answer ONE question from each unit.

(4X12=48 Marks)

(1X12=12 Marks)

1. Answer all questions

- What is coherence?
- What is meant by resolving power of a grating?
- State Brewster's law.
- Write the characteristics of a laser.
- Write any two advantages of optical fibers.
- State the principle involved in Hologram.
- What is the role of resistance in LCR circuit?
- State Hall effect.
- Give the expression for velocity of Electro-magnetic wave.
- What is meant by dual nature of light?
- What is normalised wave function?
- If an electron is accelerated to a potential of 100V. Find its wavelength.

UNIT I

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

(OR)

- What do you understand by double refraction? Explain Huygen's theory of double refraction in a uniaxial crystal. 8M
 - Calculate the thickness of the quarter wave plate when the wavelength of the light is equal to $5890\text{\AA}$ and $\mu_0 = 1.55$ and $\mu_e = 1.54$. 4M

UNIT II

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

(OR)

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

UNIT III

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

(OR)

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

UNIT IV

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

(OR)

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

