

**B. Tech. DEGREE EXAMINATION, MAY - 2015**

**(Examination at the end of First Year)**

**Paper - III : Physics**

**Time : 3 Hours**

**Maximum Marks : 75**

Answer question No. 1 Compulsory

(15 × 1 = 15)

Answer ONE question from each unit

(4 × 15 = 60)

All questions carry equal marks

- 1) a) Explain Magnetosrfriction.  
b) Explain Dispersive of grating.  
c) Explain Biot-savart's law.  
d) Define Fermi level.  
e) Write down applications of lasers.  
f) Explain spontaneous emission.

**Unit - I**

- 2) a) What is piezo electric effect? Explain the production of ultrasonics using piezo – electric Gystal Give applications of ultrasonics in medicine and industry.

OR

- b) What is meant by diffraction of light? Give the theory of fraunhoffer diffraction due to a single slit and hence obtain the condition for primary and secondary maxima. Using this obtain intensity distribution curve.

**Unit – II**

- 3) a) Explain Hall effect and mention its uses. Derive expression for Hall coefficient.

OR

- b) Explain faraday's laws of electromagnetic induction. Obtain expression for growth of electric current in a circuit containing inductance, Resistance and a constant E.M.F.

**Unit – III**

4) a) What is Compton effect? Derive an expression for the Compton shift.

OR

b) What do you understand intrinsic and extrinsic semiconductors? Explain p-type and n-type semiconductors with energy band diagrams.

**Unit – IV**

5) a) Explain characteristics of a laser. Describe the construction and working of Ruby laser.

OR

b) What is meissner effect? Explain type – I, type – II superconductors and high temperature superconductors.

