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 x 15 = 60)_

**All questions carry equal marks**

1)   a)   Explain Magnetoslriction.

    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.

⌘⌘⌘