Code: 15A56101

B.Tech I Year II Semester (R15) Supplementary Examinations November 2017
ENGINEERING PHYSICS
(Common to IT, ECE, EIE & ME)

Time: 3 hours   Max. Marks: 70

PART – A
(Compulsory Question)
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1   Answer the following: (10 X 02 = 20 Marks)
   (a)   Two independent non coherent sources of light cannot produce interference pattern. Why?
   (b)   Explain the role of an optical resonator in laser.
   (c)   Define primitive cell. Give an example.
   (d)   Write any two applications of ultrasonic waves.
   (e)   Compute the de-Broglie wavelength of an electron whose kinetic energy is 10 eV.
   (f)   State Bloch theorem.
   (g)   Define depletion region.
   (h)   Write the properties of dia magnetic materials.
   (i)   What is critical temperature in super conductors?
   (j)   Write any two applications of nano materials.

PART – B
(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2   (a)   With ray diagram discuss the theory of thin films and derive the condition for constructive interference in reflected system.
    (b)   A parallel beams of light $(\lambda = 589\,A^{\circ})$ is incident on a glass plate $(\mu = 1.5)$ such that an angle of refraction into plate is 60°, calculate the smallest thickness of the plate which will make it appear dark by reflection.

OR

3   (a)   Discuss Fraunhofer diffraction due to single slit.
    (b)   Distinguish between interference and diffraction.

UNIT – II

4   (a)   Derive the expression for inter planar spacing in a cube.
    (b)   Sketch the following planes in cubic unit cell (010) (110) (111).

OR

5   Explain Bragg's law of X-ray diffraction and describe the Powder method of X-ray diffraction.

UNIT – III

6   (a)   Derive Schrodinger time independent wave equation.
    (b)   Write physical significance of $'\Psi'$.

OR

7   Discuss in brief about the behaviour of particle in periodically varying potentials.

UNIT – IV

8   (a)   Distinguish between intrinsic and extrinsic semiconductors.
    (b)   Explain I-V characteristics of p-n junction diode.

OR

9   (a)   Explain hysteresis curve.
    (b)   Distinguish between soft and hard magnetic materials.

UNIT – V

10 (a)   Mention the applications of Josephson's effect.
    (b)   Explain BCS theory of super conductivity.

OR

11 (a)   Describe the method of chemical vapour deposition in nano materials preparation.
    (b)   Write mechanical properties of nano materials.