B.Sc. DEGREE EXAMINATION, APRIL 2018.

III YEAR VI SEMESTER

Core Major - Paper XV - SOLID STATE PHYSICS AND SEMI-CONDUCTOR DEVICES

Time : 3 Hours Max. Marks :60

SECTION A – (10 × 1 = 10 marks)

(Q. No. 1-12)Answer any *TEN* questions

1. What do you mean by primitive cell?
2. For a cubic lattice, draw (110) and (101) planes.
3. State Bragg's law.
4. What is the reason for using natural crystals for diffraction of X-rays?
5. What are dia magnetic materials?
6. What is hysteresis in magnetic materials?
7. Define a dielectric constant.
8. Name the different types of polarizations.
9. What do you understand by rectifier?
10. What are the advantages of FET?
11. What is space lattice?
12. State Curie Weiss law.

SECTION B – (5 × 4 = 20 marks)

(Q. No. 13-19)Answer any *FIVE* questions

1. Explain the diamond structure.
2. A beam of X-rays with wavelength 0.8420 A is incident on NaCl crystal. Calculate the interplanner spacing of NaCl crystal if the first order Bragg's reflection takes place at glancing angle of 8 °35'.
3. Discuss the properties of ferromagnetic materials.
4. Obtain the Clausius- Mosotti relation.
5. Explain the construction of UJT.
6. Explain the characteristics of FET with suitable diagram.
7. Write a note on dielectric breakdown.

SECTION C – (3 × 10 = 30 marks)

(Q. No. 20-24)Answer any *THREE* questions

1. Describe the hexagonal close packed structure and calculate the atomic packing factor.
2. Explain how the crystal structure is determined by rotating crystal method.
3. Describe the Langevin's theory of diamagnetism.
4. Explain the different types of polarisation and hence the Discuss the frequency and temperature effects on polarization
5. Discuss the V-I characteristics of SCR. Describe its fabrication.