

Roll No.

(05/24)

11831

M. Sc. EXAMINATION

(For Batch 2017 to 2020 Only)

(Second Semester)

PHYSICS

PHY-201

Solid State Physics

Time : Three Hours

Maximum Marks : 70

Note : The question paper will consists of nine questions in all. Q. No. 1 is compulsory and consists of five short answer type questions of 2 marks each. In addition there are eight more questions comprising of two questions from each of the four Units. Attempt *four* more questions of 15 marks each, selecting *one* question from each Unit.

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P.T.O.

1. (a) Define Brillouin zones.
(b) Define quantization of elastic waves.
(c) Describe crystal potential.
(d) Describe Fullerenes.
(e) Explain Miller indices.

Unit I

2. Describe reciprocal lattice and its application to diffraction technique.
3. Discuss scattered wave amplitude and crystal structure factors.

Unit II

4. Discuss acoustical and optical phonon modes of lattice vibrations (elastic waves).
5. Describe free electron fermi gas. Discuss energy levels and density of orbitals in one dimension.

Unit III

6. Define Crystal Potential. Discuss Kronig-Penny model in detail.
7. Discuss in detail Magneto-resistance and quantum hall effect.

Unit IV

8. Derive Loudon equation with regard to superconductivity.
9. Describe type-I and II superconductors. Discuss BCS theory in detail.