Seat No: _____ Enrollment No: _____

PARUL UNIVERSITY

FACULTY OF APPLIED SCIENCE

M.Sc. Summer 2017-18 Examination

Semester: 2 **Date: 11/05/2018**
Subject Code:11204153 **Time:10:30am-1:00pm**
Subject Name: Solid State Properties and Physics of Semiconductor **Total Marks: 60**

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1. A) Essay type/ Brief note (Each of 04 marks) **(08)**

(a) Derive the Bloch wall

(b) Write a note on Diamagnetism

Q.1. B) Answer the following questions (Any two)

(a) Short note: Derive the Heisenberg model. **(04)**

(b) Explain Nuclear magnetic resonance. **(04)**

(c) Write a note on Para magnetism. **(04)**

Q.2. A) Answer the following questions.

(a) Short note: Explain Meissner effect. **(04)**

(b) Define London equation. **(04)**

Q.2. B) Answer the following questions (Any two)

(a) Short note: Derive Single Particle tunneling. **(03)**

(b) Write a note on Isotope effect. **(03)**

(c) Explain Type - I and Type -II superconductors. **(03)**

Q.3. A) Essay type/ Brief note (Each of 04 marks) **(08)**

(a) Explain in detail carrier concentration in a semi-conductor.

(b)Explain the concept of Fermi level.

Q.3. B) Answer the following questions (Any two)

(a) Short note: Define energy band in detail. **(04)**

(b) Explain semiconductors and insulator with suitable examples. **(04)**

(c) Write a note on The Hall effect. **(04)**

Q.4. A) Answer the following questions.

(a) Short note: Explain equilibrium in Fermi level. **(04)**

(b) Define space charge, depletion region and abrupt junction. **(04)**

Q.4. B) Answer the following questions (Any two)

(a) Short note: Explain with graph current voltage characteristics. **(03)**

(b) Define capacitance voltage characteristics. **(03)**

(c) Draw and explain in short band diagram of p-n junction in thermal equilibrium. **(03)**