8. (a) Explain the following terms in closed packed structure : **10**

(i) Partial Dislocation

(ii) Stacking Fault.

(b) Discuss the principle and working of electron microscope. **10**

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CC-283

M. Sc. EXAMINATION, Dec. 2017

(Third Semester)

(Main & Re-appear)

PHYSICS

Phy-605-B

Crystallography and Imperfections in Crystals

Time : 3 *Hours*] [*Maximum Marks :* 100

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Give the concept of space group and its relevance with crystal structure. **4**

(b) What are the applications of powder diffraction method ? **6**

(c) Explain the Reitveld analysis along with its limitations. **10**

2. (a) Discuss the principle of powder diffractometer. **10**

(b) How can we interprete the powder photograph ? **10**

Unit II

3. (a) How can we index the oscillation photograph ? **10**

(b) Discuss the method orienting a crystal about a crystallographic axis. **10**

4. (a) Explain the Bernel Chart. **10**

(b) Discuss the Burger precession method with the suitable diagram. **10**

Unit III

5. (a) Explain the S chottky defect and its thermodynamics using a proper diagram. **10**

(b) What do you mean by edge dislocation ? Explain with the help of suitable diagram. **10**

6. (a) Discuss the strain and stress field in dislocations. **10**

(b) Explain the colour centres F, M, R and V using diagram. **10**

Unit IV

7. Explain the following techniques : **10+10=20**

(a) FTIR

(b) Raman Spectroscopy.