

Roll No. ....

Total Pages : 03

**LMDQ/M-24**

**7519**

**INORGANIC CHEMISTRY SPECIAL-VI**

**Paper : CHEM-404**

**(OBES/LOCF)**

Time : Three Hours]

[Maximum Marks : 60

**Note :** Eight questions will be set, *two* from each of sections A, B, C & D. Attempt five questions in all selecting at least *one* question from each Section. All questions carry equal marks.

**Section A**

1. (i) Discuss the various photochemical stages. **6**  
(ii) Explain briefly : **6**
  - (a) Excitation process
  - (b) Quantum yield
  - (c) Bi-molecular quenching
2. (i) Discuss the photochemical kinetics in detail. **5**  
(ii) Discuss Jablonski-Diagram. **7**

### Section B

3. Discuss in detail : **12**
- (i) Photo-rearrangement reactions
  - (ii) Photo-redox reactions
  - (iii) Photo-isomerization reactions
4. Explain the following : **5,5,2**
- (i) Charge transfer spectra in metal complexes.
  - (ii) Nitrogen fixation
  - (iii) Carbon dioxide reduction.

### Section C

5. (i) Discuss the following : **9**
- (a) Glass transition temperature
  - (b) Melting temperature
  - (c) Non-crystalline materials
- (ii) Write a note on Hume-Rothery rules. **3**
6. Discuss the following : **8,4**
- (i) Class  $A_2$ ,  $B_3$  type compounds
  - (ii) Structure of polymers

### Section D

7. (i) Write a note on Schottky and Frankel defects. **8**
- (ii) Explain line and plane defects. **4**
8. (i) Difference between intrinsic and extrinsic semiconductors. **4**
- (ii) Explain Band theory in detail. **4**
- (iii) Discuss Metal-excess and Metal-deficiency defects. **4**