

PC-492
M.Sc. CHEMISTRY (FOURTH SEMESTER)
Examination- JUNE-2020
Compulsory/Optional
Group – A,B,C
Paper-I
PHOTOCHEMISTRY & SOLID STATE CHEMISTRY

Time:- Three Hours]

[Maximum Marks:80

नोट : दोनों खण्डों से निर्देशानुसार उत्तर दीजिए। प्रश्नों के अंक उनके दाहिनी ओर अंकित हैं।

Note: Answer from Both the Section as Directed. The Figures in the right-hand margin indicated marks.

Section-A

1. **ANSWER ALL QUESTION OF THE FOLLOWING** **1x10**
- (a) Write the relationship in between energy, velocity of light and wave-Length?
 - (b) Write the structural formula of O-ALLYLPHENOL?
 - (c) Which type of electronic excitation is found in ketone?
 - (d) Write the chemical formula of BENZOPHENONE?
 - (e) Write the structural formula of Dewar benzenes?
 - (f) Write the name of end product founds in photochemical reaction of $\text{CH}_3\text{CH}_2\text{CHO}$?
 - (g) Which type of point defects found in AgBr?
 - (h) Write the name of crystal defects which Lowers the density of crystals?
 - (i) Write the name of Scientist who first discovered the phenomena of Superconductivity?
 - (j) How many types of superconductors are used based on magnetic response?
2. **ANSWER THE FOLLOWING QUESTIONS** **2x5**
- (a) What are the type of excitation given by organic compounds? Provide an example for each type of excitation?
 - (b) Explain the mechanism of formation of oxetane?
 - (c) What is impact of smog on human life.
 - (d) Discuss the kinetics of solid state reactions?
 - (e) Define the terms direct and indirect band gap Semiconductors?

Section-B

ANSWER ALL THE QUESTIONS

12x5

Unit-I

3. Explain quantum yield and discuss the transfer of excitation energy in photochemical reactions?

OR

What do you mean by adiabatic reaction intermediate case and diabatic reaction? Derive equation for rate constant of photochemical reactions?

Unit-II

4. Discuss the photochemistry of cyclization reactions and rearrangement of 1,4-dienes?

OR

Explain the following reactions of carbonyl compounds with example:-

- (i) Norrish I&II type reactions
- (ii) Intermolecular reaction in cyclic carbonyl compound.

Unit-III

5. Write notes on the following:-

- (i) Photo Fires Rearrangement
- (ii) Barton reaction.

OR

Explain the following reactions:-

- (i) Photo-isomerization reaction in aromatic compounds.
- (ii) Photo-addition reaction in aromatic compounds.

Unit-IV

6. What are perfect and imperfect crystals? Discuss the thermodynamics of schottky and frenkel defect formation.?

OR

Explain the following terms:-

- (i) H-centre and V-centre.
- (ii) Dislocations.
- (iii) Topotactic and epitactic reactions.

Unit-V

7. Describe band theory of conductors, semiconductors and insulators. How these can be identified by Band Theory of solids?

OR

Write short notes on the following:-

- (i) Photoelectric effect.
- (ii) Paramagnetism.
- (iii) Organic superconductors.