



UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Eighth Semester – 2020

Roll No. in Fig.

Roll No. in Words.

Paper: Physical Chemistry (Sp. Theory-II)

Course Code: CHEM-423 Part – I (Compulsory)

Time: 15 Min. Marks: 10

ATTEMPT THIS PAPER ON THIS QUESTION SHEET ONLY.

Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

Signature of Supdt.:

Q.1. Encircle the correct option.

(10x1=10)

- I. In $\text{CH}_2 = \text{CH}_2$, which electronic transition is most possible in uv-visible region:
A σ to σ^* B n to σ^*
C π to π^* D n to π^*
- II. In Raman scattering, the lines observed on high frequency side of Rayleigh line are called:
A Anti-stoke's lines B Stoke's lines
C Scattered lines D Elastic lines
- III. Energy of photon is directly related to its
A Wavelength B Frequency
C Both A & B D None
- IV. When excited electron show de-excitation from 4th shell to 2nd shell ($n=2$), which type of series are observed?
A Balmer series B Paschen series
C Lyman series D Brackett series
- V. The macromolecules possess:
A High viscosity B High molecular weight
C High density D All of these
- VI. Which of the following polymers is/are thermosetting polymer?
A Polyvinyl chloride B Polyethers
C Diene rubber D Both a & b
- VII. Polar solvents generally shifts π to π^* band to:
A Shorter wavelength B Longer wavelength
C Cause no change in wavelength D Can shorter or longer the wavelength
- VIII. In Raman Scattering, When the energy of emitted photon is greater than that of incident/absorbed photon, thenlines are observed:
A Anti-stoke's lines B Stoke's lines
C Scattered lines D Rayleigh lines
- XI. The weight average molecular mass of macromolecules is.....than the number average molecular mass:
A greater B lesser
C equal D none of these
- X. Molar mass of polymer are determined by which methods?
A Osmometry B Viscometry
C Light scattering D all of these



ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q.2. Answer the following short questions. (10x2=20)

A. Write down the classification of polymers on the basis of thermal behaviour.

B. What is the principle of electronic spectroscopy?

C. What are anti-stokes line in Raman spectroscopy.

~~D. Define polymerization with example.~~

E. What is Terminal model in kinetics of copolymerization?

F. What is z-average molecular weight?

G. What is the significance of polymers in daily life?

H. What is Franck-Condon principle?

I. What is the principle of membrane osmometry?

J. What are symmetric top molecules?

Answer the following Questions (3x10=30)

Q. 3. (a) Discuss kinetics of step growth polymerization in the absence of acid catalyst. (5)

(b) Discuss Gel Permeation Chromatography in detail. (5)

Q. 4. (a) What is Raman spectroscopy? Discuss Rayleigh scattering and molecular polarizability. (5)

(b) Discuss pure Raman spectra of linear molecules. (5)

Q. 5. (a) Discuss energy of atomic orbitals with reference to H-atom spectrum. (5)

(b) Define chain growth polymerization. What steps are involved in chain growth polymerization? (5)