



UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program /Eighth Semester – 2019

Paper: Physical Chemistry (Sp. Theory-II)

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

Time: 15 Min. Marks: 10

Roll No. in Fig.

Roll No. in Words.

Signature of Supdt.:

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.

Q.1. Encircle the correct option.

(10x1=10)

- i.** Which of the Following is an example of condensation polymerization?
a. Polystyrene b. Polyvinyl chloride c. Nylon 6,6 d. all
- ii.** Scattering of radiations observed in Raman spectroscopy are;
a. Stoke's line b. Rayleigh scattering c. Anti-stoke's line d. all of these
- iii.** $\sigma\text{-}\sigma^*$ transition are shown by;
a. Alkene b. Alkane c. Alkyne d. both a & c
- iv.** Which of the following is not a biopolymer;
a. Carbohydrate b. protein c. plastic d. lipids
- v.** Electronic spectroscopy is a type of spectroscopy which is also known as;
a. Microwave b. UV/visible c. Radio-wave d. Infra-red
- vi.** The electronic transitions in the UV/Vis spectroscopy take place in the region of;
a. 200-800 nm b. 400-800 nm c. 450-850 nm d. 10-800 nm
- vii.** R-R-R-R-R-R or S-S-S-S-S-S arrangement is a polymer type called;
a. Isotactic b. Syndiotactic c. Atactic d. Heterotactic
- viii.** Addition polymerization is;
a. Cationic addition b. free radical addition c. anionic addition d. all of these
- ix.** The unit of Raman shift used in Raman spectra on X-axis is;
a. Cm b. Cm^2 c. Cm^{-1} d. Cm^3
- x.** Glass transition temperature is the property of which polymers;
a. Crystalline b. amorphous c. both d. none of these



ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

SHORT QUESTIONS

Q. 2 Answer the following short questions: (2x10)

- a) What are thermosetting polymers? Give example.
- b) Define and give example of condensation polymerization.
- c) What are the spherical top molecules?
- d) What is meant by $n-\pi^*$ transition?
- e) What is the principle electronic transitions?
- f) Define Raman Spectroscopy.
- g) What is z-Average molecular weight ?
- h) Define and give example of addition polymerization.
- i) What is role of molecular polarizability in Raman Spectroscopy?
- j) What is GPC and its contribution for polymers?

Answer the following questions in detail (Long Questions)

3. What is electronic spectroscopy? Write applications of electronic spectroscopy. (10)
4. Discuss viscosity method for determination of average molar mass of high polymers. (10)
5. Write note on the following; (5x2)
 - a. Vibrational-Raman Spectra
 - b. Stark effect