

Roll No.

94144

**B. Sc. (Hons.) Chemistry 6th Semester
Examination – May, 2024**

PHYSICAL CHEMISTRY – II

Paper : CH(H)-604

Time : Three Hours] [Maximum Marks : 40

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

Note : Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is *compulsory*. All questions carry equal marks.

~~1.~~ (a) What is black body ? 1 × 8 = 8

(b) What is visualising agent ?

(c) How antibonding molecular orbitals are formed ?

(d) Give one example of Auto Catalytic reactions.

(c) Define Born-oppenheimer approximation ?

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P. T. O.

~~5.~~ (a) Explain Bohr Model of atom. What are its drawbacks ? 4

(b) Discuss the similarities and differences between Valence bond theory and molecular orbital theory. 4

SECTION – C

6. (a) Discuss the Michaelis-Menten mechanism of enzyme catalysis. 4

(b) Explain adsorption theory for heterogeneous catalysis. 4

~~7.~~ (a) What is meant by positive and negative catalysis ? Describe with example. 3

(b) Explain the term catalysis. Write brief notes on autocatalysis and shape selective catalysis. 5

SECTION – D

8. (a) Describe the principle of differential migration and explain its nature. 4

(b) Write short note on adsorption Chromatography. 2

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- (c) How can two substances having similar k_f values be separated? 2

9. Explain :

- (a) Partition chromatography 4
(b) High Performance liquid chromatography 4

- (f) What is Planck's Law?
(g) Define Gerade orbitals.
(h) What is coefficient of atomic orbital in sp^3 hybrid orbital?

SECTION - A

2. (a) State and explain Compton effect and Compton shift. 3
(b) Discuss Bohr's model of hydrogen atoms and its defects. 3
(c) Explain the basic ideas of Molecular Orbital theory. 2
3. (a) How did Planck explain black body radiations? Derive Planck's Radiation Law. 4
(b) Write notes on : 4
(i) Heat capacity of solids.
(ii) Gerade and ungerade molecular orbitals.

SECTION - B

4. (a) How can LCAO be applied to H_2^+ ion to calculate its energy. 4
(b) Explain the characteristics of π & π^* orbitals. 4