

PHYSICAL CHEMISTRY
(Common for B.Sc., B.Sc. Bio Tech., B.Sc. Industrial
Microbiology, Semester-II) Paper – III

Time Allowed : Three Hours

[Maximum Marks : 35]

Note : The candidates are required to attempt *five* questions in all by selecting *two* questions each from Section A and B while Section C is compulsory. All questions carry equal marks.

Section : A

1. (a) Why do solutions deviate from ideal behaviour?
(b) Show that relative lowering in vapour pressure is a colligative property.
(c) A 10% solution of cane sugar (Molecular weight 342) is isotonic with 1.75 M solution of Urea. Find molecular weight of Urea. 3,2,2
2. (a) Derive thermodynamically relationship between depression in freezing point and molal depression constant.
(b) What is Vant Hoff factor? How is it used for determination of degree of association of solute? 4,3
3. (a) What are gels? Give their characteristics and examples.
(b) Discuss Tyndall effect in Colloids.
(c) State and explain Hardy Schulz rule. 3,2,2
4. (a) Explain origin of charge on colloidal particles.
(b) What are emulsions? How are they prepared? Give the types of emulsions. 3,4

Section : B

5. (a) Why does rate of reaction increase with increase in temperature?
(b) Derive expression for rate constant of zero order reactions.
(c) Differentiate between order and molecularity of reaction. 2,3,2
6. (a) Half life period of radioactive element is 100 secs. Calculate its disintegration constant and average life period. How much time will it take for 90% decay?
(b) How does Catalyst effect rate of reaction?
(c) Discuss Ostwald isolation method for the determination of order of reaction. 2,2,3
7. (a) Discuss transition State theory for reaction rates.
(b) What is activation energy? How is it calculated from Arrhenius equation? 4,3
8. (a) Explain mechanism of enzyme catalysis.
(b) What do you mean by Catalytic promoters and Catalytic poisons? 4,3

Section : C

9. Write on the following in short :
(a) What is normality of 1.5 M H_2SO_4 ?
(b) What are Azeotropes? Give example.
(c) What do you mean by critical micellization concentration?
(d) What is meant by electro dialysis?
(e) What is cause of Peptisation of Colloids?
(f) Define instantaneous rate of reaction.
(g) Distinguish between law of mass action and rate law. 7×1=7