

10. (a) Explain with suitable examples of B.E.T. theory for multilayer adsorption.

Or

- (b) Write the mechanism of Michael-Menton's enzyme catalysed reaction. Discuss the effect of temperature and pH on it.

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12POC05

(For the candidates admitted from 2012–2013 onwards)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2017.

Second Semester

Chemistry and Organic Chemistry

PHYSICAL CHEMISTRY — II

Time : Three hours

Maximum : 75 marks

SECTION A — (5 × 5 = 25 marks)

Answer ALL questions.

1. (a) Define fugacity. Give the method of determination of fugacity.

Or

- (b) How will you determine activity coefficient from freezing point? Explain.

2. (a) Give the comparison between gas phase and solution reaction.

Or

- (b) State and explain kinetic isotopic effect.

3. (a) Write a brief account on quantum numbers. Discuss its significances.

Or

- (b) Give the ground state term symbol for Mn^{2+} ion.

4. (a) Write the selection rules for Raman spectra.

Or

- (b) Write the symmetry of hybrid orbitals in methane (CH_4) molecule.

5. (a) Distinguish between physical and chemical adsorption.

Or

- (b) Write the mechanism of Acid-Base catalysis.

SECTION B — ($5 \times 10 = 50$ marks)

Answer ALL questions.

6. (a) How will you determine activities and activity coefficient from vapour pressure, freezing point and boiling point? Explain.

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- (b) Write a note on the following :

(i) Mean ionic activity. (3)

(ii) Mean ionic molality. (3)

(iii) Concept of ionic strength. (4)

7. (a) Explain with suitable examples of primary salt effect.

Or

- (b) Derive and explain Linear free energy relationship and Taft equation.

8. (a) Set up Schrodinger equation for hydrogen atom. Solve the solution for energy and wave function.

Or

- (b) Discuss the applications of Variation method to Helium atom.

9. (a) Give the procedure to determine the vibrational modes in water (H_2O) molecule.

Or

- (b) Discuss the possible electronic transition in formaldehyde molecule.

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