SARDAR PATEL INSTITUTE OF SCIENCE AND TECHNOLOGY MAHAVIDYALAYA

Pre – University Examination (2020)

B.Sc. I

TIME -3h **(PAPER I) [PHYSICALCHEMISTRY]** **M.M: 45**

Note - Attempt only five questions. All questions carry equal marks. Question no.1 is compulsory.

Attempt two questions from each section.

Q.1. Answer not more than 200 words

(a). What is mean free path ?

(b) What is C.P.U?

(c). What do you understand by space lattice, unit cell, and interfacial angle?

(d). Why lyophilic sols are more stable than lyophobic sols.

(e). Show that log (m x n) = log m + log n

[Section – A]

Q. 2. Define critical parameters. Show that for a vander Walls gas compressibility factor is 3/8.

Q.3. Derive Bragg's equation for the diffraction of x-rays by crystal lattice. Describe determines of crystal structure of NaCl.

Q.4.Explain the presence of charge on colloidal particles. Discuss electrophoresis and electroosmosis.Describe the general rule which governs the coagulation of sol by addition of an electrolyte.

Q.5. Define the terms molecularity and order of reaction. Derive expression for rate constant of first order reaction. Show that half life period of first order reaction is independent of the initial concentration of the reaction.

[Section –B]

Q.6 (a) What are the postulates of kinetic theory of gases?

(b) What are liquid crystals? How are they classified?

Q.7. Discuss any two of the following –

(i) Determination of order of reaction (ii) Activation energy (iii) Intermolecular forces in liquids

Q.8 Write short note on any two of the following:-

(a) Hardy-Schulze law (b) Emulsion (c) Gel

Q.9. Write short note on any two of the following-

(i) Nanomaterial (ii) Superconductors (iii) Crystal defects

Q.10. Write short note on any two of the following-

(i) Radial distribution function of liquid (ii) Macromolecules (iii) Gold number