

**V.P. & R.P.T.P.SCIENCE COLLEGE**  
**(SEMESTER – VI) INTERNAL EXAMINATION**

Physical Chemistry: US06CCHE05

Time: 11:00 a.m. to 12:30 p.m.

Date: 16-03-2018, Friday

Total Marks: 25

Q – 1 : Choose the correct option from the following.( Multiple choice question) [03]

- (i) The m-dichlorobenzene has dipole moment \_\_\_\_\_ o-dichlorobenzene.  
 (a) same as (b) greater than (c) less than (d) none of the above
- (ii) A silver iodide sol was prepared by mixing  $\text{AgNO}_3$  and KI solution with KI in slight excess. The AgI sol is \_\_\_\_\_.  
 (a) negatively charged because of excess  $\text{I}^-$  adsorbed  
 (b) positively charged because of excess  $\text{K}^+$  adsorbed  
 (c) negatively charged because of excess  $\text{NO}_3^-$  adsorbed  
 (d) neutral
- (iii) The rotational degree of freedom for non-linear molecule is \_\_\_\_\_.  
 (a) 1 (b) 2 (c) 3 (d) none



Q – 2 : Answer the following. (Any two) [04]

- (i) What are the conditions required to observe vibrational spectra.
- (ii) Define: (a) Peptization (b) Coagulation
- (iii) Give the Clausius–Mosotti equation for **polar** molecules. State the each terms involved.

Q–3 Derive an expression for determination of molecular parameters of diatomic polar molecule from pure rotational spectra. [06]

**OR**

Q–3 (a) Describe various modes of vibration of polyatomic molecule giving suitable example. [03]

(b) Sketch and explain P-Q-R bands observed in IR spectra. [03]

Q–4 (a) Describe the Vapour-Temperature method for measuring the dipole moment of a molecule. [03]

(b) Describe the various types of induced polarization of molecules in an electric field. [03]

**OR**

Q–4 (a) Describe the principle, construction and working of Abbe's refractometer. [03]

- (b) The bond length of H-F bond is  $0.9168 \text{ \AA}$  and dipole moment observed is  $1.909 \text{ D}$ . [03]  
Calculate the ionic bond character of HF molecule.

Q-5 (a) Discuss the methods for the purification of colloidal solutions. [03]

(b) Distinguish between true solution, a colloidal solution and a suspension. [03]

**OR**

Q-5 (a) Distinguish between Lyophilic Sols and Lyophobic Sols. [03]

(b) Explain four important applications of colloids. [03]

