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Total Number of Pages : 01

M.Sc.I
FCYC802

8th Semester Regular Examination 2018-19

PHYSICAL CHEMISTRY–VI

BRANCH : M.Sc.I(AC)

Time : 3 Hours

Max Marks : 70

Q.CODE : F152

Answer Question No.1, which is compulsory, and any FIVE from the rest.

The figures in the right hand margin indicate marks.

- Q1 Answer the following questions : (2 x 10)**
- a) Can the activation energy of a reaction be zero or negative? Prove it.
 - b) Write down one example of opposing, parallel and consecutive reactions, respectively.
 - c) State different steps involved in a chain reaction.
 - d) What do you mean by reaction in flow systems?
 - e) Define the term Diffusion Coefficient.
 - f) State the relation between diffusion coefficients and mean free path.
 - g) State the factors affecting the CMC of surfactants.
 - h) Define the term reverse micelles.
 - i) State the Franck-Condon Principle.
 - j) What do you mean by vibronic transitions?
- Q2 a) Derive the rate constant expression of consecutive reactions. (5)**
b) Discuss the collision theory of bimolecular gaseous reactions (5)
- Q3 a) Discuss the kinetics of branched chain reaction. (5)**
b) Illustrate the effect of nature of the solvent and ionic strength on the rate of ionic reactions. (5)
- Q4 a) State and explain Fick's first and second laws of diffusion. (5)**
b) Discuss different Einstein's relation on diffusion. (5)
- Q5 a) Define the term critical micelle concentration and discuss the thermodynamics approach to CMC. (5)**
b) Discuss the thermodynamics of micellization, solubilization, and microemulsions. (5)
- Q6 Discuss both thermodynamic and statistical mechanics formulations of the activated complex theory of bimolecular reactions (10)**
- Q7 Discuss with diagram the intramolecular photophysical processes and intermolecular energy transfer. (10)**
- Q8 Write short answer on any TWO : (5 x 2)**
- a) Rice-Herzfeld scheme.
 - b) Factors affecting the CMC of surfactants.
 - c) Bimolecular Photophysical Processes.