CLASS: **MSC./PRE-PHD**   **SEMESTER : I/NA**
BRANCH: **CHEMISTRY**   **SESSION : MO/18**

SUBJECT: CH402 CHEMICAL KINETICS & SURFACE CHEMISTRY

TIME: **03:00**   **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a)   Discuss the kinetics of parallel reactions along with the suitable examples.   [5]
Q.1(b)   Discuss activated complex theory.   [5]

Q.2(a)   Write down the Debye-Huckel limiting law. Why this is called limiting law? How can it be verified?   [5]
Q.2(b)   Write down the Ilkovic equation and explain the different term involved in it. Draw and explain a typical   [5]
         program.

Q.3(a)   Give an account of the Debye-Huckel theory of strong electrolytes. Explain clearly what is meant by   [5]
         asymmetry and electrophoretic effect?
Q.3(b)   Write down Butler-Volmer equation. How the Tafel equation can be derived from Butler-Volmer   [5]
         equation.

Q.4(a)   Derive an expression for Langmuir's adsorption isotherm. What will happen at low and high pressures?   [5]
Q.4(b)   Write down the BET equation. What are the different parameters obtained from BET equation?   [5]

Q.5(a)   State and derive Lambert-Beer law for light absorption by solution.   [5]
Q.5(b)   State and explain the term 'quantum yield'. How do you account for the fact that the quantum yield   [5]
         for the photochemical reaction H_2 (g) + Br_2 (g) $\rightarrow$ 2HBr (g) is low (0.01) while that of the reaction
         H_2 (g) + Cl_2 (g) $\rightarrow$ 2 HCl (g) is very large (10^5).

******30.11.18******M