

6. (a) What are enzymatic reactions ? Give Michaelis-Menton treatment of these reactions and hence define Michaelis-Menton constant. Also discuss the extreme conditions of high and low concentrations of substrate. **12**
- (b) Evaluate Michaelis's constant for enzyme-substrate binding by Lineweaver-Burk plot. **8**

Unit IV

7. (a) What do you mean by the following terms.
Width and intensity of spectral lines. **10**
- (b) What kind of spectrum will you get for a non-rigid rotator of diatomic molecules and how ? Show the spectra. **10**
8. (a) How will you get the rotational fine structure in case of electronic-vibration transition ? **10**
- (b) What is Fortrat diagram ? Explore the information obtained by labelling Fortrat diagram. **10**

M-BB-293

4

90

No. of Printed Pages : 04

Roll No.

BB-293

M. Sc. EXAMINATION, May 2017

(Second Semester)

(Main & Re-appear)

CH-506-B

CHEMISTRY

Physical Chemistry-II

(Kinetics, Quantum Mechanics and Spectroscopy)

Time : 3 Hours]

[Maximum Marks : 100

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : The question paper comprises of eight questions, two from each Unit. The candidates are required to attempt *Five*

(3-08/19)M-BB-293

P.T.O.

questions selecting at least *one* question from each Unit. All questions carry equal marks. Log tables and single memory calculator may be used.

Unit I

1. (a) Give formulation of Schrödinger wave equation. **8**
 (b) Briefly explain all the postulates of quantum mechanics with examples wherever possible. **12**
2. (a) Solve Schrödinger wave equation for a particle in one-dimensional box and explain the results obtained. **10,10**
 (b) Evaluate the expectation values of x , x^2 , p and p^2 for a particle in one-dimensional box of length a and show that the product of root mean square uncertainties in p and x is greater than $h/2\pi$.

Unit II

3. (a) What are consecutive or sequential reactions ? Give kinetics of these reactions by explaining their conclusions. **12**
 (b) How are reaction rates affected by temperature ? Also define temperature coefficient. **8**
4. (a) State and explain collision theorem of bimolecular gaseous reactions. Give its significance and compare it with Arrhenius equation. **10**
 (b) What are ionic reactions ? Give single-sphere model of activated complex and also discuss its results. **10**

Unit III

5. (a) What are the reactions ? Explain the kinetics of reactions between H_2 and Br_2 . **12**
 (b) Discuss decomposition of ethane and hence give chain length. **8**