

SECOND SEMESTER EXAMINATION 2021-22**M.Sc. - CHEMISTRY****Paper - III****Physical Chemistry**

Time : 3.00 Hrs.

Max. Marks : 80

Total No. of Printed Page : 03

Mini. Marks : 29

Note: Question paper is divided into three sections. Attempt question of all three section as per direction. Distribution of Marks is given in each section.

Section - 'A'**Very short type question (in few words).****6x2=12**

Q.1 Attempt any six question from the following questions :

- (i) Differentiate eigen function and eigen value ?
- (ii) Write Ground State Term for P^4 configuration?
- (iii) What is Ordinary angular momentum ?
- (iv) Define partition function ?
- (v) Write difference between Assembly and Ensemble?
- (vi) What do you understand by BOA ?
- (vii) Write the criteria for fast reactions.
- (viii) Define Critical Micelle concentration (CMC) ?
- (ix) What is Fire Resistant Polymer ? Give example.

(2)

- (x) Give the definition of Overvoltage ?

Section - 'B'

Short answer question (In 200 words)

4x5=20

Q.2 Attempt any four question from the following questions :

- (i) Discuss Zeeman Splitting ?
- (ii) Derive an expression for eigen value of angular momentum ?
- (iii) Write note on Probability theorem in statistical thermodynamics ?
- (iv) Explain fluxes and forces ?
- (v) Give the expression for thermodynamics of Micellization ?
- (vi) Describe the importance of Overvoltage ?
- (vii) Write note on Michalis Menten Kinetics ?

Section - 'C'

Long answer/Essay type question.

4x12=48

Q.3 Attempt any four question from the following questions :

- (i) What do you mean by Russell Sounder's term and Coupling Scheme ?
Explain with p^n and d^n conjiguration.
- (ii) Explain Translational and Vibrational Partition Function and its applications.
- (iii) What is Phenomenological Equation ? Discuss microscopic reversibility and Onsager's Reciprocity relation ?

(3)

- (iv) Derive an expression for Hinshelwood theory for unimolecular reactions.
- (v) (a) What is liquid crystal polymer ?
- (b) A protein sample with Haemoglobin ($M=15.5 \text{ Kg mole}^{-1}$), Ribonuclease ($M=13.7 \text{ Kg mole}^{-1}$) and Myoglobin has ($M=17.2 \text{ Kg mol}^{-1}$). Calculate number average and mass average molecular weight and give the clue.
- (vi) Define Polarisation and Decomposition Potential. How you should eliminate Polarisation Decomposition Potential. Explain with Aqueous solution and Neutral Solution.

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