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Reg. No.

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I Semester M.Sc. Degree Examination, June/July - 2022

CHEMISTRY

Physical Chemistry-I

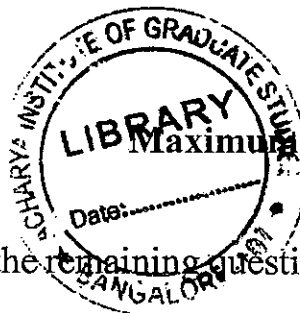
(CBCS Scheme-2019-20 Onwards)

Paper: CH-103

Time : 3 Hours

Instructions to Candidates:

- 1) Answer question no. 1 and any five of the remaining questions.
- 2) Figures to the right indicate marks.



Maximum Marks : 70

Answer any TEN questions:

(10×2=20)

1.
 - a) Define a quantum of energy according to Plank's hypothesis.
 - b) Find the Eigen value of the function $\sin x$.
 - c) Define degeneracy states.
 - d) What is Slater determinant?
 - e) What is Zeeman Effect?
 - f) State Pauli-exclusion principle?
 - g) Define chain inhibition with an example.
 - h) Write the factors affecting the rate of a reaction.
 - i) Define mean ionic activity coefficient.
 - j) What is BET used for? Mention its application.
 - k) How does substituents effect the rate of reaction?
 - l) Outline the effect of temperature on adsorption.

[P.T.O.]



2. a) List the term symbol for $L=3$ and $S=1$ and mention the Ground state term.
b) Derive time dependent schrodinger equation for 1D box. (5+5=10)
 3. a) Discuss the principle of the first and second order wave equations?
b) Formulate the time independent Schrodinger equation. (5+5=10)
 4. a) Give a brief account on collision and transition state theories.
b) How does the primary salt affect on the rate of reaction in solution? (5+5=10)
 5. a) Discuss the kinetics of enzyme catalyzed reactions with an example.
b) Derive BET equation. (4+6=10)
 6. a) Mention all the postulates of quantum mechanics.
b) What is first order perturbation theory? Give statement and proof. (4+6=10)
 7. a) Give a brief account on Russell-Saunders and JJ-Coupling.
b) Explain briefly the explosion limit in chemical kinetics. (5+5=10)
 8. a) Explain the mechanism of surface reaction and write the industrial application of catalysts.
b) Give the statement and proof of variation method? (5+5=10)
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