Adikavi Nannaya University

III Semester M.Sc Physical Chemistry Model Question paper

PAPER-I: ADVANCED CHEMICAL KINETICS AND PHYSICAL CHEMISTRY OF POLYMERS

(Effective from the 2016-17 admitted Batch)

Time 3 hours Answer **ALL** Questions Max Marks: 75

PART-A

All questions carry equal marks

(4x15=60 Marks)

1. a) Write a short note on the following:

i) Theories of uni molecular gas phase reactions

ii) Hinshelwood treatment

Or

b) Write about the chain reactions H_2–Cl_2 and H_2–O_2

2. a) Write about the following:

i) Complex reactions ii) Parallel and Oppose reactions

Or

b) Write about various NMR methods in determining exchange rates

3. a) Write about the following

i) Distinguish between condensation and addition polymers

ii) Write about solution and emulsion polymerisation

Or

b) Write a short note on the following:

i) Co polymerisation ii) Ziegler Natta catalysis

4 a) Write about Flory-Huggins treatment and its limitation.

Or

b) Write about the determination of molecular weights of polymers by osmometry and Viscometry.

SECTION-B (5 x 3 = 15 M)

ANSWER ANY FIVE QUETIONS

i) Write about Taft Equation.
ii) Write about explosion limits.
Iii) Write about steady rate technique.
iv) What about Menten model.
v) Write about graft copolymers.
vi) Write about the properties of polymers.
vii) Write about viscosities of polymer solutions.
viii) Write about the properties of polyesters.

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PAPER II: QUANTUM CHEMISTRY –II AND CHEMICAL APPLICATIONS OF SYMMETRY AND GROUP THEORY

(Effective from the 2016-17 admitted Batch)

Time 3 hours Answer **ALL** Questions Max Marks: 75

PART-A

All questions carry equal marks

(4x15=60 Marks)

2. a) Write a short note on the following:

iii) Quantum mechanical tunnelling effect

iv) Harmonic oscillator

Or

b) Write about the following:

i) Degeneracy of the energy levels ii) Hermite polynomials

2. a) Write about the following:

i) Space quantization of electronic orbitals ii) Vector model of the atom

Or

b) Write about commutation with Hamitonian-Spin-Orbit interaction.

3. a) Write about orhogonality theorem and its consequences.

Or

b) Write about Ligand Field Theory.

4 a) Write about symmetry selection rules for I.R. and Raman activity.

Or

b) Write about accidental degeneracy and Fermi Reasonance

SECTION-B (5 x 3 = 15 M)

ANSWER ANY FIVE QUETIONS

i) Write about wave mechanics of simple systems.
ii) Write about recursion formula.
Iii) Draw the shapes of p and d orbitals.
iv) What about angular momentum.
v) Write about irreducible representations.
vi) Draw the M. O correlation diagram for H_2O molecule.
vii) Write about different symmetry operations.
viii) Write about the symmetries of total degrees of freedom.