MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI – 627012

OPEN AND DISTANCE LEARING (ODL) PROGRAMMES

(FOR THOSE WHO JOINED THE PROGRAMMES FROOMTHE ACADEMIC YEAR 2023 – 2024 ONWARDS)

B. SC CHEMISTRY

CORE – IX ORGANIC CHEMISTRY – 1 / JMCH51

ASSIGNMENT QUESTION I

1. (A) Explain Fischer, Newman, and Sawhorse projection formulae with suitable examples.

(Or)

(B) Describe the C.I.P. rules and assign R/S configuration to molecules with one or two chiral centres.

ASSIGNMENT QUESTION II

2. (A) Write the preparation and important reactions of aliphatic amines, including Hofmann degradation and Gabriel phthalimide synthesis.

(Or)

(B) Explain the preparation and reactions of aromatic amines. Discuss diazotization and coupling reactions of benzene diazonium chloride.

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B. SC CHEMISTRY

CORE – X INORGANIC CHEMISTRY – 1 / JMCH52

ASSIGNMENT QUESTION I

1. (A) Explain Werner's coordination theory and discuss different types of isomerism shown by coordination compounds.

(Or)

(B) Describe Crystal Field Theory (CFT). Explain crystal field splitting in octahedral and tetrahedral complexes.

ASSIGNMENT QUESTION II

2. (A) Write the general characteristics of lanthanoids and actinoids. Explain lanthanoid contraction and its consequences.

(Or)

(B) Describe the preparation and properties of silicones (e.g., PDMS) and write notes on any phosphorus- or sulfur-based inorganic polymer.

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B. SC CHEMISTRY

CORE – XI PHYSICAL CHEMISTRY – 1 / JMCH53

ASSIGNMENT QUESTION I

1. (A) Explain Gibbs and Helmholtz free energies. Derive the Gibbs–Helmholtz equation and mention two applications.

(Or)

(B) Write the rate equations and characteristics for zero, first, and second order reactions. Explain Arrhenius equation and activation energy.

ASSIGNMENT QUESTION II

2. (A) Distinguish between physical and chemical adsorption. Explain Freundlich and Langmuir adsorption isotherms.

(Or)

(B) State Lambert–Beer law. Explain quantum efficiency and discuss any photochemical reaction (e.g., H_2–Cl_2 reaction).

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B. SC CHEMISTRY

CORE – XII RESEARCH AND METHODOLOGY / JMCH54

ASSIGNMENT QUESTION I

1. **(A)** Define research. Explain the types of research (basic, applied, qualitative, quantitative).

(Or)

(B) What is a research problem? Explain identifying a problem, literature review, and hypothesis formulation.

ASSIGNMENT QUESTION II

2. **(A)** Write notes on: (i) Laboratory safety (ii) Research ethics (iii) Digital tools in research.

(Or)

(B) Explain the structure of a research report. Describe features of any one referencing style (APA/MLA/ACS).

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B. SC CHEMISTRY

ELECTIVE – V NANO SCIENCE / JECH51

ASSIGNMENT QUESTION I

1. **(A)** Define nanoscience, nanoparticles, quantum dots, and nanocomposites. Explain top-down and bottom-up synthesis methods.

(Or)

(B) Explain optical properties of nanomaterials – SPR and Quantum Confinement effect with applications.

ASSIGNMENT QUESTION II

2. **(A)** Describe the working principles of SEM and TEM. Give their applications in nanomaterial characterization.

(Or)

(B) Write short notes on Carbon Nanotubes – types, CVD synthesis, and applications.

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B. SC CHEMISTRY

ELECTIVE – VI INDUSTRIAL CHEMISTRY / JECH52

ASSIGNMENT QUESTION I

1. (A) Explain the classification of fuels. Write notes on proximate and ultimate analysis of coal and characteristics of a good fuel.

(Or)

(B) Describe the manufacture of sugar from sugarcane. Explain three methods of food preservation and the role of food additives.

ASSIGNMENT QUESTION II

2. (A) What are abrasives? Explain types of abrasives and write notes on diamond, carborundum, and boron carbide.

(Or)

(B) Define lubricants and explain any five properties. Write briefly about the manufacture and properties of cement.

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B. SC CHEMISTRY

NMC/SUBSTITUTE PAPER /APPLIED CHEMISTRY / JNCH51

ASSIGNMENT QUESTION I

1. (A) Explain fuel classification. Write notes on proximate/ultimate analysis of coal and characteristics of a good fuel.

(Or)

(B) Describe the manufacture of urea with flow chart and equations. Write briefly about any two insecticides.

ASSIGNMENT QUESTION II

2. (A) Explain the manufacture and types of soaps. Write differences between soaps and detergents.

(Or)

(B) Describe the manufacture of Portland cement and the setting and properties of cement.