S–3066	Sub. Code
	23MCH1C1

M.Sc. DEGREE EXAMINATION, APRIL 2024

First Semester

Chemistry

ORGANIC REACTION MECHANISM — I

(CBCS – 2023 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A   (10 × 2 = 20)

Answer **all** questions.

1. How will you differentiate intermediate from transition state?

2. Mention the need for cross over experiments.

3. Predict the electrophile in the nitration of benzene.

4. What is the role of Friedal crafts catalyst in alkylation\acylation of benzene?

5. Under what conditions, ion-pair mechanism operates?

6. Why does nucleophilic substitution does not take place at bridgehead carbon?

7. Assymetric carbon, chiral centre are not the essential condition for optical activity but chirality is the essential condition for optical activity — Justify.

8. Predict the nature of vicinal protons in cis-1, 2-dimethyl cyclopropane.

9. State and explain Bredt's rule with suitable example.

10. Which is more stable either diaxial 1,2 or diaxial 1,3 dimethyl cyclohexane? Give appropriate reason.

Part B $(5 \times 5 = 25)$

Answer **all** questions, choosing either (a) or (b).

11. (a) Using reaction profile diagram explain the kinetic and thermodynamic stability of the 1,2 and 1,4 products formed during nucleophilic substitution on allylic halides.

Or

(b) Write a note on linear free energy relationship and explain the significance of substiuent and reaction constant.

12. (a) N-Alkyl derivatives of aniline and O-Alkyl derivatives of phenol have reactivity comparable to aniline and phenol respectively, while their acyl derivatives are much less reactive in electrophilic substitution.

Or

(b) Compare and contrast SE1 with SEi mechanism.

13. (a) Describe with mechanism Sommelet-Hauser rearrangement and Smiles rearrangement.

Or

(b) Using resonance contributors, why a phenyl group is ortho/para director while nitrobenzene is meta director?

2 **S–3066**

14. (a) Describe the stereochemistry of biphenyl, allenes and spiranes.

Or

(b) How will you distinguish the following:

(i) R, S Notation with re and phe notation

(ii) D, L Notation with d,l notation.

15. (a) With suitable examples, explain the Neighbouring group participation involving σ and pi electrons.

Or

(b) Describe the application of Cotton effect and axial halo ketone rule in determing the configuration.

Part C $(3 \times 10 = 30)$

Answer any **three** questions.

16. Write a note on the following:

(a) Primary and secondary kinetic isotope effect

(b) Hammett and Taft equation.

17. Taking suitable examples, explain the aromaticity in benzenoid, nonbenzenoid and annulenes.

18. How will you distinguish Benzyne mechanism from SNAr mechanism? Explain with evidences for each.

19. Describe the following with suitable examples

(a) Epimerisation

(b) Muta-rotation

(c) Racemisation

20. What information does ORD Curves give for determination of configuration of optical isomers?

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3 | **S–3066**

M.Sc. DEGREE EXAMINATION, APRIL 2024

First Semester

Chemistry

STRUCTURE AND BONDING IN INORGANIC CHEMISTRY

(CBCS – 2023 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** the questions.

1. Define Bent's rule.

2. What are iso poly and hetero poly acids?

3. What is meant by Madelung constant?

4. The lattice energy of AgBr is 895 KJ mol^{-1}. Predict the Lattice energy of the isomorphous AgI using Born-Lande equation. The numerics of $r_c + r_a$ is 321 pm for AgBr and 342 pm for AgI.

5. What is the coordination geometry of Wurtzite?

6. What is the structure and formula unit of rock salt?

7. Write the principle of TEM method.

8. What is JCPDS files? Mention its use.

9. What is Frankel effect?

10. Distinguish between conductor and semiconductor.

Answer **all** questions, choosing either (a) or (b).

11. (a) Give the preparation, properties and uses of S_4N_4.

Or

(b) What is Pauling's rule of electrovalence? How is it useful in isomorphous replacement in silicates?

12. (a) Explain Born-Lande equation.

Or

(b) Explain screw axis and glide plane with neat diagrams.

13. (a) Discuss sol-gel method of crystal growth.

Or

(b) Explain the structure of NiAs.

14. (a) Explain the method of interpretation of XRD data.

Or

(b) Discuss the instrumentation of SEM method.

15. (a) What is linear defect? Mention its types and their effect.

Or

(b) What is meant by defects in crystal? How are they classified? Give examples.

Answer any **three** questions.

16. (a)   Discuss the structure of dodeca carborane.

     (b)   Explain   the   structures   of   three   dimensional
           silicates.

17. (a)   Determine the symmetry elements and assign the
           point group of

           (i)   ammonia

           (ii)   water molecules

     (b)   Discuss the packing of ions in simple and cubic close
           packing.

18. What are normal spinel and inverse spinel types? Predict
     the following compounds as normal or inverse spinel

     (a) Fe_3O_4

     (b) $FeCr_2O_4$

19. Discuss   the   theory,   Principle   instrumentation   and
     applications of Electron microscopy.

20. (a)   Discuss the band theory of solids.

     (b)   Explain how the solid defect affects the properties of
           solids?

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S–3068

M.Sc. DEGREE EXAMINATION, APRIL 2024

First Semester

Chemistry

Elective — PHARMACEUTICAL CHEMISTRY

(CBCS – 2023 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A   (10 × 2 = 20)

Answer **all** the questions.

1. Give the formula for calculation of molar refraction of drug molecules.

2. Explain the term induced polarization.

3. Mention any application of radiopharmaceutical in therapeutics.

4. How degree of ionization affects drug metabolism?

5. Mention any two artificial sources of drugs.

6. Define: pharmacopoeia. Give one suitable example.

7. Define SAR with one example.

8. Explain the term isoterism.

9. Mention the different types of information storage in computers?

10. What are I/O devices? Give examples.

Part B   (5 × 5 = 25)

Answer **all** the questions, choosing either (a) or (b).

11. (a) Explain the terms molar and specific refraction.

   Or

   (b) Comment on the rheology of pharmaceutical systems.

12. (a) Describe the applications of scintillation counters.

   Or

   (b) Discuss the principle of Neutron activation analysis.

13. (a) Discuss the classification of different dosage forms of drugs.

   Or

   (b) Write a note on different routes for administration of drugs.

14. (a) Discuss induced fit theory and occupancy theory of drug action.

   Or

   (b) Explain the term QSAR. Write a note on drug receptor interactions.

15. (a) Describe briefly the organisation and role of various components in computer.

   Or

   (b) Write a program for least square fit using C+.

                     2   **S–3068**

Part C   (3 × 10 = 30)

Answer any **three** questions.

16. Describe the principle of optical activity and its importance to drug metabolism.

17. Comment on the application of radiopharmaceuticals in diagnostics and sterilization.

18. Briefly discuss about drug nomenclature and its implications.

19. Write a note on factors affecting bioactivity of drugs.

20. Write a program in C+ for calculating numerical integration and differentiation.

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S–3069

M.Sc. DEGREE EXAMINATION, APRIL 2024

First Semester

Chemistry

Elective — NANOMATERIALS AND NANOTECHNOLOGY

(CBCS – 2023 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A   (10 × 2 = 20)

Answer **all** the questions.

1.   How does nanotechnology work?

2.   How have nanomaterials been defined?

3.   What is the principle of sol-gel method?

4.   List out the several uses for carbon nanotubes.

5.   Give the synthesis of silver nanoparticles.

6.   What are the novel mechanical properties of NPs?

7.   Define Hall Effect.

8.   What is meant by tunneling conduction of NPs?

9.   What are ceramic nano composites?

10.   Give the principle of SEM.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Discuss the applications of Nano technology in material science.

Or

(b) Write different modes of classification of Nanomaterials. List out Challenges faced by Nanotechnology.

12. (a) Write a note on electrochemical synthesis of nano materials.

Or

(b) How does size change affect the optical and electrical properties of NPs?

13. (a) Illustrate the Adhesive and friction properties of nanoparticles.

Or

(b) Write a note on synthesis and properties of iron oxide NPS.

14. (a) How is semi conducting materials classified? Give examples.

Or

(b) Compare the quantum confinement and resulting structures like Quantum dots, quantum wells and their physical significance.

15. (a) Describe the instrumentation of AFM techniques.

Or

(b) Discuss the synthesis and aproperties of polymer composites.

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Part C $(3 \times 10 = 30)$

Answer any **three** questions.

16. Discuss Bottom up approach of synthesis of Nanomaterial.

17. Write short notes on :

    (a) Metallic nano particles

    (b) Types of CVD.

18. Discuss the different theories relevant to study mechanical properties of NPs.

19. Explain the following :

    (a) Hall voltage

    (b) Photovoltaic cell

    (c) GaP

20. Discuss the instrumentation of SEM technique. Compare and contrast SEM and TEM.

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M.Sc. DEGREE EXAMINATION, APRIL 2024

First Semester

Chemistry

Elective — ELECTRO CHEMISTRY

(CBCS – 2023 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** the questions.

1.   Calculate ionic strength of 0.15 molal KCl solution.

2.   What is meant by Vant't Hoff factor?

3.   Define the term electrophoresis.

4.   What is meant by outer Helmholtz plane (OHP)?

5.   Define Overpotential.

6.   What are cathodic and anodic currents?

7.   What is meant by transfer coefficient?

8.   Mention the limitations of Pourbiax diagram.

9.   Write the Principle of polarography?

10. How does a fuel cell differ from battery?

Part B   (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Give an account of the Debye-Huckel theory of strong electrolytes.

Or

(b) Explain the terms Activity coefficient and mean ionic activity coefficient.

12. (a) Discuss the Applications and limitations of Zeta potential.

Or

(b) Write a note on Helmholtz-Perrin model of structure of electrified Interface.

13. (a) At 22°C the exchange current density of a Pt │H_2(g) │ H^+(aq) electrode is 0.72 mA cm^{-2}. Calculate the current flowing through a standard electrode od area 4.8 cm^{-2} when the overpotential is +4.38 mV.

Or

(b) What is Tafel plot? Explain with a neat diagram.

14. (a) What is over voltage? Mention its applications.

Or

(b) Discuss Butler-Volmer equation for a multistep reaction.

15. (a) Write a note on role of supporting electrolytes in electro analytical techniques.

Or

(b) Discuss the working of a fuel cell.

2   **S–3070**

Part C $(3 \times 10 = 30)$

Answer any **three** questions.

16. Derive the Debye – Huckel – Onsager conductivity equation, giving clearly the assumptions made. How can it be verified?

17. Give a detailed account on Chapman and Stern Model of electrical double layer.

18. Derive the Butler-Volmer equation in the kinetics of the electrode reaction.

19. (a) Explain Evan's diagram with a neat diagram.

    (b) How will you determine the transfer coefficient?

    (5+5)

20. Explain the construction and working of fuel cell and cathodic strippling voltammetry.

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M.Sc. DEGREE EXAMINATION, APRIL 2024

First Semester

Chemistry

Elective — MOLECULAR SPECTROSCOPY

(CBCS – 2023 onwards)

Time : 3 Hours $\qquad$ Maximum : 75 Marks

Part A $\qquad$ $(10 \times 2 = 20)$

Answer **all** the questions.

1. State the rule of mutual exclusion principle.

2. What are stokes and anti-stokes lines?

3. What is meant by force constant?

4. Homonuclear diatomic molecules are IR inactive. Why?

5. What are valence and core electrons?

6. Explain hyper and hypochromic shift

7. Explain nuclear overhauser effect

8. What is meant by 'g' value? Give the g value of free electron?

9. Predict the ^{31}P-NMR of H_3PO_4.

10. Define Nitrogen rule.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain the effect of isotopic substitution in rotational spectral lines.

Or

(b) Discuss the information obtained from rotational spectra.

12. (a) Why do overtones and combination bands appear in IR spectra? How does Fermi resonance appear in IR?

Or

(b) Explain the different types of IR vibrations with neat diagrams.

13. (a) Discuss the applications of dissociation and predissociation spectra.

Or

(b) Explain the PES spectrum of nitrogen.

14. (a) State and explain zero field splitting and Krammer's degeneracy.

Or

(b) Explain different types of coupling in NMR spectroscopy.

15. (a) Explain Mossbauer spectra iron carbonyls.

Or

(b) Discuss the principle and applications of MALDI technique.

2 **S–3071**

Part C $(3 \times 10 = 30)$

Answer any **three** questions.

16. (a) The rotational constant for CO is 1.9314 cm^{-1} and 1.6116 cm^{-1} in the ground and first excited vibrational states, respectively. By how much does the internuclear distance change as a result of this transition.

    (b) Discuss the quantum theory of Raman effect.

17. (a) Explain the selection rules for IR and Raman spectra.

    (b) Write a note on P, Q and R branches in IR spectroscopy.

18. Describe the principle and applications of XPS.

19. (a) Explain the hyper fine splitting with suitable examples.

    (b) State and explain spin decoupling technique.

20. Discuss the principle and applications of Mossbauer spectroscopy.

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M.Sc. DEGREE EXAMINATION, APRIL 2024

Second Semester

Chemistry

ORGANIC REACTION MECHANISM – II

(CBCS – 2023 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** the questions.

1. What happened when 2-bromobutane react with potassium hydroxide?

2. Give details the anti-Markovnikov's rule observed in the free radical addition of HBr to an unsymmetrical alkene.

3. In a hydride transfer reaction, is the hydride ion $\left(H^-\right)$ acting as a nucleophile or an electrophile? Briefly explain your answer.

4. What is the primary function of dicyclohexylcarbodiimide (DCC) in organic synthesis?

5. Provide one example of a rearrangement reaction that involves a 1, 2-shift to an electron-deficient carbon.

6. Mention the product class formed in a Benzidine rearrangement.

7. Give an example of a reagent used for the electrophilic addition reaction to a carbon-carbon double bond.

8. Comment on Prins reaction.

9. Write the full name of m-CPBA. Give its role of organic synthesis.

10. Write note -on Suzuki Coupling reaction.

Part B $(5 \times 5 = 25)$

Answer **all** the questions, choosing either (a) or (b).

11. (a) Predict the major product(s) and explain the stereochemistry observed during the E2 elimination reaction between (2R, 3S)-2,3-dibromobutane and KOH (aq) in ethanol.

Or

(b) Predict the order of increasing stability for the following free radicals and explain the factors influencing their stability: $CH_3CH_2 \bullet$, $CH_3CH(CH_3)\bullet$, $(CH_3)_3C^{\bullet}$.

12. (a) Find out the product. Give its plausible mechanism.
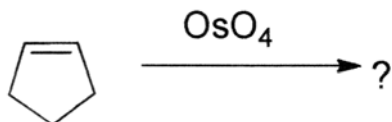
Or

(b) Write the reaction and mechanism of MPV reduction.

S–3072

13. (a) Outline the mechanism of the Beckmann rearrangement using a labeled diagram. Include the role of the acidic conditions typically employed.

Or

(b) Discuss the mechanism of Stevens's rearrangement.

14. (a) What are carbenes? How carbenes are react with trans alkenes?

Or

(b) Complete the following reaction. Give its plausible mechanism.
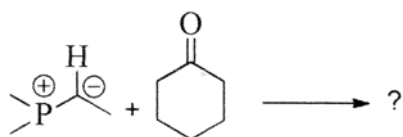
15. (a) Explain two examples of how diazomethane is used in organic synthesis.

Or

(b) Describe two key features of N-bromosuccinimide (NBS) that make it a valuable reagent in organic synthesis.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. (a) Briefly explain the difference between the Hofmann rule and the Saytzeff rule. Include appropriate examples for each rule to illustrate their application in predicting the major product of a dehydro halogenation reaction.

(b) Differentiate between short-lived and long-lived free radicals based on their lifetimes and reactivity.

(7+3)

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S–3072

17. Complete the following reaction. Give their plausible mechanism.

(a)

(b)
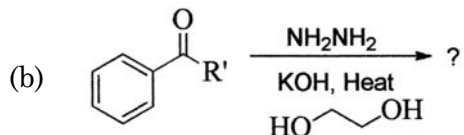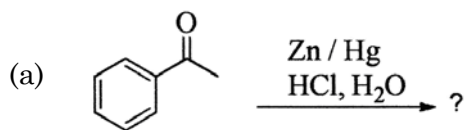
18. Explain the reaction and mechanism of Dienone-phenol and Favorski rearrangement.

19. How does the reactivity of different carbonyl compounds vary towards Grignard addition? Briefly explain the reasons behind the observed reactivity differences.

20. (a) Explain how LDA's steric hindrance can achieve regioselectivity and chemoselectivity in organic reactions. Provide an example. (6)

    (b) Explain the key features of the Negishi coupling reaction. (4)

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4

S–3072

M.Sc. DEGREE EXAMINATION, APRIL 2024

Second Semester

Chemistry

PHYSICAL CHEMISTRY — I

(CBCS – 2023 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** the questions.

1. Define chemical potential.

2. What is meant by activity coefficients?

3. What are ensembles?

4. What is molar heat capacity?

5. Define equivalent conductance.

6. What are thermodynamic forces?

7. Define electrokinetic effect.

8. Write Michaeli's- Menton equation.

9. Define Chain reaction with an example.

10. Write the differences between Thermal and photochemical reactions.

Part B $(5 \times 5 = 25)$

Answer **all** questions, choosing either (a) or (b).

11. (a) Define fugacity. How can fugacity be determined in the laboratory?

Or

(b) Define the term :

    (i) Activity coefficient.

    (ii) Standard state. $(2\frac{1}{2} + 2\frac{1}{2})$

12. (a) Discuss briefly the quantal microcanonical ensemble.

Or

(b) Distinguish between Fermi – Dirac and Bose – Einstein Statistics.

13. (a) Derive an expression for entropy production due to heat flow.

Or

(b) Verify, the Onsager reciprocal relations for a simple reversible reaction.

14. (a) Write a note on Potential energy surfaces.

Or

(b) Explain briefly the primary and secondary salt effects.

15. (a) Discuss the kinetics of branched chain reactions.

Or

(b) Explain temperature jump method for studying kinetics of fast reactions.

2   **S–3073**

Answer any **three** questions.

16. Derive Duhem- Margulus equation and discuss its applications of ideal and non-ideal mixtures.

17. State clearly the assumptions made in Einstein formulation of heat capacity of solids. Using this assumption obtain an expression for the heat capacity of solids.

18. Define and discuss the four electrokinetic effects SP, EO, EOP and SC.

19. Describe the activated complex theory of bimolecular reactions. Explain how this theory helps in evaluating standard enthalpy of activation and standard entropy of activation.

20. Derive an equation for the kinetics of hydrogen-chlorine reaction.

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M.Sc. DEGREE EXAMINATION, APRIL 2024

Second Semester

Chemistry

Elective – MEDICINAL CHEMISTRY

(CBCS – 2023 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1.   Define Agonist.

2.   Why do drug cause side effects?

3.   How will you define antibiotic?

4.   Write a general structure of penicillin.

5.   Define Testosterone.

6.   What is Methimazole.

7.   What are Antihypertensive?

8.   Short note on Amilorde.

9.   What is Ibuprofen?

10.   Define chemistry of insulin.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Write a note on H_{-1} receptor antagonists.

Or

(b) What is receptors? Explain with example.

12. (a) Explain the classification of antibiotics.

Or

(b) Discuss the clinical application of penicillins.

13. (a) Write a note on Sildenafil and Tadalafil.

Or

(b) Explain the Levonorgestrel Corticosteroids.

14. (a) Describe the classification of cardiovascular agents.

Or

(b) Explain the mechanism of action of hydrochlorothiazide.

15. (a) Define analgesics. Give some examples.

Or

(b) Write a note on types of diabetics.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Discuss the physicochemical factors influencing drug action.

17. Explain the current trends in antibiotic therapy.

S–3074

18. Describe the Thyroid and antithyroid drugs.

19. Write a note on hypertension.

20. Explain the treatment of diabetic mellitus.

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S–3074

M.Sc. DEGREE EXAMINATION, APRIL 2024

Second Semester

Chemistry

Elective – GREEN CHEMISTRY

(CBCS – 2023 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. Define Green chemistry.

2. What is meant by autumn economy?

3. Give any two examples of green reagents.

4. List any two green solvents.

5. What are basic catalysts? Give an example.

6. Give any two examples of polymer supported catalysts.

7. What is meant phase transfer catalysts?

8. Write any one displacement reaction.

9. List the any two applications of green synthesis.

10. Define Sono chemistry.

Part B $(5 \times 5 = 25)$

Answer **all** questions choosing either (a) or (b).

11. (a)   Explain the coals green chemistry.

        Or

    (b)   Discuss the limitations of green chemistry.

12. (a)   List out the advantages and disadvantages of super critical CO_2.

        Or

    (b)   Explain the green synthesis of adipic acid.

13. (a)   Write a note on green catalysts with examples.

        Or

    (b)   Explain the oxidation catalysts with example.

14. (a)   Discuss the saponification reaction with examples.

        Or

    (b)   Explain the anhydride formation.

15. (a)   Explain the instrumentation of microwave induced green synthesis.

        Or

    (b)   Give an account of Ultra sound assisted green synthesis.

2   **S–3075**

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Give an account of international green chemistry organization and their role.

17. Discuss about ionic liquids in detail with examples.

18. Describe the role of green catalysts in controlling environmental pollution.

19. Draw the structure of crown ether and explain its properties and uses.

20. Explain the Cavitation theory in detail.

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3 **S–3075**

M.Sc. DEGREE EXAMINATION, APRIL 2024.

Second Semester

Chemistry

Elective – BIO-INORGANIC CHEMISTRY

(CBCS – 2023 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. What are the major iorn proteins?

2. Define Tyrosinase.

3. What are cytochromes?

4. Short note on carboxypeptidases.

5. What is metal cluster in nitrogenase?

6. What is photosynthesis?

7. Give two importance of metals in medicine.

8. Write a short note on Technetium imaging agents.

9. Define enzyme reactions.

10. What is meant by poisoing of enzymes?

Part B $(5 \times 5 = 25)$

Answer **all** questions choosing either (a) or (b).

11. (a) What are the metallo-enzymes? Explain the term of epoenzymes.

Or

(b) Give the structural features and functions of Iron enzymes.

12. (a) What are cytochromes? Give their structural features.

Or

(b) Explain the structure and classification of Ferredoxin.

13. (a) What is the structure of the proposed model for the active site of nitrogenase?

Or

(b) Draw the structure of chlorophyll and give its significance in photosynthesis.

14. (a) What is the effect of deficiency and excess of Zn, Cd and Pb?

Or

(b) Explain the platinum containing anticancer agents.

15. (a) Describe the Michelis-Menton equation.

Or

(b) Discuss the free energy of activation and effects of catalysis.

2   **S–3076**

Part C $(3 \times 10 = 30)$

Answer any **three** questions.

16. Bring out the important structural features of the vitamin B_{12} and its biochemical Importance.

17. Give the structural features of the active site of cytochrome P-450.

18. Give an account of biological nitrogen fixation.

19. Explain the toxicity of some non-essential metals.

20. Discuss the nomenclature and classification of enzymes.

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S–3076

M.Sc. DEGREE EXAMINATION, APRIL 2024

Second Semester

Chemistry

Elective – MATERIAL SCIENCE

(CBCS – 2023 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** the questions.

1.   Define Point group.

2.   What are Space group?

3.   What is meant by Sol-Gel method?

4.   Define Meta stable state.

5.   What are the different types of luminescence?

6.   Mention the different types of polarization.

7.   Define Meissner effect.

8.   Give any two examples of Ferri magnetic material.

9.   What are solar cells?

10.   Give any two examples of Os(II) complexes.

Part B $(5 \times 5 = 25)$

Answer **all** questions choosing either (a) or (b).

11. (a) State and explain Bragg's law.

                    Or

    (b) Explain the Bravais lattices.

12. (a) Explain the Bridgeman-Stock Barger method of crystal growth.

                    Or

    (b) Describe the Czochralski method of crystal growth.

13. (a) Write a note on orientation polarization.

                    Or

    (b) Explain the space charge polarization.

14. (a) Explain Domain theory.

                    Or

    (b) Discuss the properties and application of Pyro electric material.

15. (a) Explain the formation of water splitting using manganese-based photosystems.

                    Or

    (b) Give an account of Pd complexes.

S–3077

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Describe the neutron diffraction method and its applications.

17. Discuss about primary and secondary extinctions with examples.

18. Explain the dielectric breakdown and its effects.

19. Write a note on Second Harmonic Generators.

20. Describe the photochemical activation and splitting of CO_2.

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S–3077

S–3078	Sub. Code
	23MCH2S1

M.Sc. DEGREE EXAMINATION, APRIL 2024

Second Semester

Chemistry

PREPARATION OF CONSUMER PRODUCTS

(CBCS – 2023 onwards)

Time : 3 Hours — Maximum : 75 Marks

Part A — $(10 \times 2 = 20)$

Answer **all** questions.

1. Define: Consumer products.

2. What makes a good consumer product?

3. What is the primary ingredient used in making jam?

4. What is the primary difference between jam and jelly?

5. What is the primary ingredient used in making Gulkand?

6. Write a note on soap and its fragrances.

7. Write the classification of lipstick.

8. What is the use of body lotions?

9. Write short note on Women beauty perfumes.

10. Write the two factors to consider when choosing a lipstick shade.

Part B   (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Define "brand loyalty" and explain its significance for consumer products.

Or

(b) Explain the concept of the product lifecycle and briefly outline the stages involved.

12. (a) Describe the basic steps involved in making jam.

Or

(b) Describe the basic steps involved in making squash.

13. (a) Describe the basic steps involved in making soap and toothpaste.

Or

(b) Explain the functions and applications of cleaning powder.

14. (a) What is hair conditioner? Discuss its types and ingredients.

Or

(b) Write a short note on benefit and drawback of using a long-lasting lipstick.

15. (a) Explain the purpose and application techniques of three essential makeup products.

Or

(b) Write a short on functions and benefits of lotions and all-purpose shaving creams in skincare.

2   **S–3078**

Part C   (3 × 10 = 30)

Answer any **three** questions.

16. Discuss how understanding the product lifecycle can inform marketing strategies for consumer products.

17. Compare and contrast the preparation methods of Gulkand and jelly.

18. Discuss in detail the extraction methods, applications, and significance of essential oils obtained from spices and flowers.

19. Describe the role of skincare products such as powders, creams, lotions, all-purpose shaving creams, and sunscreen in maintaining healthy skin.

20. Explain the concept of herbal makeup preparations and discuss their benefits compared to conventional makeup products.

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3