

(DCHE 21)

M.Sc. DEGREE EXAMINATION, DECEMBER 2019.
Second Year
Chemistry
ANALYTICAL CHEMISTRY

Time : Three hours

Maximum : 70 marks

SECTION A — ($4 \times 7\frac{1}{2} = 30$ marks)

Answer any FOUR questions from the following.

1. How do you determine P_k values of Acid-base indicator by using UV-Visible Spectroscopy?
2. Write the principle and applications of Turbidimetry.
3. Define Fluorescence and Phosphorescence. Make a comparison between Fluorescence and Phosphorescence Spectroscopy.
4. Explain the construction of Hollow Cathode Lamp (HCL). Write about Flame gases used in Atomic Absorption Spectroscopy.
5. Write about the formation of Ion-Association Systems in Sorbent extraction with examples.
6. Explain the principle and application of conductometric titrations.
7. Write the principle and applications of Polarography.
8. Write the principle, development techniques and applications of Paper Chromatography.

SECTION B — ($4 \times 10 = 40$ marks)

Answer ALL questions, choosing ONE from each Unit.

9. (a) Describe the principle of UV-Visible Spectroscopy. How to you determine Vanadium in complex matrix by UV-Visible Spectroscopy.

Or

- (b) Write the working principle and application of Infra Red (IR) Spectroscopy for the study of Quantitative Analysis.
10. (a) Explain the theory, principle and application of Flame Photometry.
- Or
- (b) Describe the instrumentation, principle and application of Fluorimetry.
11. (a) Write the principle and application of Redox Titrations.
- Or
- (b) Write the principle and application of amperometric titrations.
12. (a) Explain the working principle, instrumentations of High Performance Liquid Chromatography (HPLC).
- Or
- (b) Describe the principle, instrumentation and applications of Column Chromatography.
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(DCHE 22)

M.Sc. DEGREE EXAMINATION,
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Chemistry

INORGANIC CHEMISTRY

Time : Three hours

Maximum : 70 marks

SECTION A — ($4 \times 7\frac{1}{2} = 30$ marks)

Answer any FOUR questions.

1. Write about separation methods of Lanthanides.
2. Explain physical properties of Lanthanides and Actinides.
3. Discuss the applications of electron absorption spectroscopy.
4. Write a short note on X-ray diffraction.
5. Explain Faraday method.
6. Explain significance of 'g' factor.
7. Discuss the classification of essential elements.
8. Explain about Metallenzymes.

SECTION B — ($4 \times 10 = 40$ marks)

Answer ALL questions.

9. (a) Discuss the magnetic and spectral properties of Lanthanides.
Or
(b) Explain different oxidation states of Lanthanides and actinides with disucss uses of Lanthanides and actinides.
10. (a) Explain about infrared spectroscopy.
Or
(b) Discuss the principle, basic instrumentation and applications of Raman Spectroscopy.

11. (a) Explain principle and applications of Mass Spectroscopy and ESR Spectroscopy.

Or

- (b) Discuss Hyperfine Splitting and Chemical Shift.

12. (a) Explain about Haemoglobin and Hemerythrin.

Or

- (b) Discuss the Carboxy Peptidase A and Carbonic Anhydrase.
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(DCHE 23)

M.Sc. DEGREE EXAMINATION,
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Second Year
Chemistry

ORGANIC CHEMISTRY

Time : Three hours

Maximum : 70 marks

SECTION A — ($4 \times 7\frac{1}{2} = 30$ marks)

Answer any FOUR questions.

1. Discuss the various electronic transitions.
2. Explain about FTIR.
3. Write a note on Fourier Transforms Technique.
4. Write a note on High Resolution Mass Spectroscopy.
5. Explain Norrish Type-II reaction.
6. Discuss the sigmatropic rearrangements.
7. Explain synthesis of Terpeneol.
8. Explain Wagner-Meerwein rearrangement.

SECTION B — ($4 \times 10 = 40$ marks)

Answer ALL questions.

9. (a) Describe Ultraviolet Spectra of aromatic and heterocyclic compounds.
Or
(b) Discuss the vibrational frequencies of carbonyl compounds and explain about combination bands.
10. (a) Define chemical shift and explain nuclear over Hauser effect.
Or
(b) Explain about Mass Spectroscopy.

11. (a) Explain about photochemical rearrangements.

Or

(b) Discuss Electrocyclic and Cycloaddition reactions.

12. (a) Discuss Stereochemistry and synthesis of Atropine.

Or

(b) Explain :

(i) Pinacol-Pinacolne rearrangement

(ii) Neber rearrangement.

(DCHE 24)

M.Sc. DEGREE EXAMINATION,
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Chemistry

ENVIRONMENTAL CHEMISTRY

Time : Three hours

Maximum : 70 marks

SECTION A — ($4 \times 7\frac{1}{2} = 30$ marks)

Answer any FOUR questions from the following.

1. What are the basic segments of environment? Explain their significance.
2. How do you determine phosphorous content in soil samples?
3. Write about Air pollution due to radio active substances.
4. Explain the causes for acid rains and their effect.
5. Describe hydrological cycle.
6. Explain the effects of pesticides and hydrocarbons on water pollution.
7. Write the principle and applications of reverse osmosis.
8. Write about the monitoring of sulphur dioxide using monitoring equipment.

SECTION B — (4 × 10 = 40 marks)

Answer ALL questions, choosing one from each unit.

9. (a) Write the principles of weathering and effect of plants on wreathing.
- Or
- (b) Explain the functions of soil and write the ion-exchange properties of soil.
10. (a) Write about the sources for the oxides of nitrogen and their emission and their effects on Air pollution.
- Or
- (b) How do you analyse aromatic hydrocarbons in Air samples?
11. (a) State water quality parameters and the composition of sea water. Write the Unique properties of water.
- Or
- (b) Discuss the effects of water pollution due to Mercury and lead.
12. (a) Write the primary and secondary treatment of water samples.
- Or
- (b) Write the determination of Biological oxygen Demand (BOD) in water samples.