

**(DCHE21)**

Total No. of Questions : 12]

[Total No. of Pages : 02

**M.Sc. DEGREE EXAMINATION, DECEMBER - 2018**

**(Second Year)**

**CHEMISTRY**

**Analytical Chemistry**

**Time : 3 Hours**

**Maximum Marks : 70**

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**SECTION – A**

**(4 × 7½ = 30)**

***Answer any Four questions from the following***

- Q1)** Write about the radiation sources and detectors used in Infrared Spectroscopy in different regions.
- Q2)** How do you determine phosphate by Spectrophotometrically?
- Q3)** Write the experimental procedure of flame photometry and interferences encountered in Flame Photometry.
- Q4)** Write the principle and applications Phosphorimetry.
- Q5)** Write the principle and applications of Coulometry.
- Q6)** Write the principle and applications of Complexometric titrations.
- Q7)** Explain batch extraction and counter-current extraction processes.
- Q8)** Write about the columns and detectors used in HPLC.

**SECTION – B**

**(4 x 10 = 40)**

**Answer All questions, Choosing one from each unit**

**Unit - I**

**Q9)** a) Write the basic instrumentation and principle of UV-visible spectrophotometry. How do you determine Manganese by spectrophotometrically instrumentation.

OR

b) Explain the principle and applications of InfraRed (IR) spectroscopy.

**Unit - II**

**Q10)** a) Write the theory, principle and applications of Atomic Absorption Spectroscopy.

OR

b) Write the instrumentation, principle and applications of Fluorimetry.

**Unit - III**

**Q11)** a) Write theory, working principle and applications of Potentiometry.

OR

b) Explain the instrumentation, principle and applications of Amperometric titrations.

**Unit - IV**

**Q12)** a) Write the instrumentation, principle and applications of HPLC.

OR

b) What are Ion-exchangers? Explain the mechanism of Ion-exchange process. Write the analytical applications of Ion-exchangers.



**(DCHE22)**

Total No. of Questions : 12]

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**M.Sc. (Second) DEGREE EXAMINATION, DECEMBER - 2018**

**(Second Year)**

**CHEMISTRY**

**Inorganic Chemistry**

**Time : 3 Hours**

**Maximum Marks : 70**

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**SECTION – A**

**(4 × 7½ = 30)**

***Answer any Four questions from the following***

- Q1)** Write about the electronic configuration and magnetic properties of actinides.
- Q2)** Make a comparison between the general properties of Lanthanides and Actinides.
- Q3)** Explain various types of electronic transitions in molecules with examples.
- Q4)** Write about the basic instrumentation and working principle of Infra Red (IR) Spectroscopy.
- Q5)** How do you determine magnetic Susceptibility of complexes by Faraday method?
- Q6)** Explain chemical shift and its influence on the interpretation of spectral data in NMR studies.
- Q7)** Write the biological importance of Sodium and Potassium.
- Q8)** Write the functions of Zinc enzymes.

**SECTION – B**

**(4 x 10 = 40)**

**Answer All questions, Choosing one from each unit**

**Unit - I**

**Q9)** a) Write the position of Lanthanides in the Periodic Table. How do you separate Lanthanides by Ion-exchange method?

OR

b) Write the general properties of actinides. What are the uses of Lanthanide and actinide compounds?

**Unit - II**

**Q10)** a) Write the basic principle of X-ray diffraction and explain the study of crystal properties by XRD.

OR

b) Write the instrumentation and principle of Raman Spectroscopy. How structural studies of inorganic samples are studied by Raman spectroscopy?

**Unit - III**

**Q11)** a) Write the basic instrumentation, principle and applications of ESR spectroscopy.

OR

b) Write the principle, instrumentation and applications of Mass spectroscopy.

**Unit - IV**

**Q12)** a) Explain the mechanism of Oxyzen Transformation.

OR

b) Explain Chelation Therapy and use of Gold compounds as natural antibiotics.



**(DCHE23)**

**Total No. of Questions : 12]** **[Total No. of Pages : 02**  
**M.Sc. DEGREE EXAMINATION, DECEMBER – 2018**  
**Second Year**  
**CHEMISTRY**  
**Organic Chemistry**

**Time : 3 Hours**

**Maximum Marks :70**

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**SECTION - A**

**Answer any four questions**

**(4 × 7½ = 30)**

- Q1)** Explain steric effect in biphenyls.
- Q2)** Write a note on FTIR.
- Q3)** Describe shielding mechanism and spin-spin interactions with examples.
- Q4)** Explain about high resolution mass spectrometry.
- Q5)** Explain photochemistry of conjugated olefins and Aromatic compounds.
- Q6)** Write a note on wood ward-Hoffmann selection rules.
- Q7)** Describe synthesis of Terpeneol.
- Q8)** Write a note on wagner-Meerwein rearrangement.

**SECTION - B**  
**Answer all questions**

**(4 × 10 = 40)**

**Q9) a)** Explain Fieser-wood ward rules for carbonyl compounds.

OR

b) Effect of hydrogen bonding and solvent effect on vibrational frequencies.

**Q10)a)** Describe the chemical shift and nuclear over Hauser effect.

OR

b) Explain the following:

i) MC lafferty rearrangement.

ii) Nitrogen rule.

**Q11)a)** Explain about Quantum yield and Norrish type – I reaction.

OR

b) Write a note on orbital – correlation diagram.

**Q12)a)** Explain synthesis of Quinine with it's structural elucidation.

OR

b) Write a note on :

i) Neber rearrangement

ii) Beckmann rearrangement.

**x x x**

**(DCHE24)**

Total No. of Questions : 12]

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**M.Sc. DEGREE EXAMINATION, DECEMBER - 2018**

**(Second Year)**

**CHEMISTRY**

**Environmental Chemistry**

**Time : 3 Hours**

**Maximum Marks : 70**

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**SECTION – A**

**$(4 \times 7\frac{1}{2} = 30)$**

***Answer any Four questions from the following***

- Q1)** Write the principles of Weathering.
- Q2)** How do you determine Iron in Soil Samples?
- Q3)** Write the causes and effects of acid rains.
- Q4)** What are the sources for radioactive pollution? Suggest methods for the minimization of radioactive pollutants.
- Q5)** Explain the industrial pollution of Water.
- Q6)** Write the effects of Mercury and lead in Water.
- Q7)** How do you determine BOD in Water Samples?
- Q8)** Write the principle and application of electro dialysis.

**SECTION – B**

(4 x 10 = 40)

**Answer All questions Choosing one from each unit**

**Unit - I**

**Q9)** a) Write the functions and ion-exchange properties of Soils.

OR

b) How do you determine Silicon in Soil Samples?

**Unit - II**

**Q10)** a) Write the analysis of Oxides of Nitrogen in Air samples.

OR

b) Explain the Air Pollution due to organic pollutants and Photochemical Smog.

**Unit - III**

**Q11)** a) Explain the effects of thermal and shipping industries on domestic water.

OR

b) Discuss the effects of Mercury, lead and Selenium in water.

**Unit - IV**

**Q12)** a) Write the secondary and tertiary treatment of Water samples.

OR

b) Explain the continuous monitoring of H<sub>2</sub>S and SO<sub>2</sub> in Air samples.

