

(DCHE21)

M.Sc. (Final) DEGREE EXAMINATION, DECEMBER – 2015

Second Year

CHEMISTRY

Paper - V : Analytical Chemistry

Time : 3 Hours

Maximum Marks: 80

SECTION -A

(4 × 8 = 32)

Answer any four questions

- 1) Write a note on photometric titrations.
- 2) Determine PK values of an acid-base indicator.
- 3) Compare and contrast Nephelometry and Turbidimetry.
- 4) Discuss the limitation of Fluorimetry and Phosphorimetry.
- 5) Explain the principle and analytical applications of AAS.
- 6) What are conductometric titrations. Draw and explain the titration curve of a complexometric titrations.
- 7) Discuss about amperometric titrations.
- 8) Explain about High Performance Liquid Chromatography(HPLC) with example.

SECTION -B

(4×12 = 48)

Answer All questions

- 9) a) Describe the instrumentation and principle of IR spectroscopy. Write its limitations.

OR

- b) Explain the determination of phosphate, iron and ammonia by using UV-visible spectrophotometer.

10) a) Explain the difference between Flame emission and Atomic absorption spectroscopy.

OR

b) Explain the principle, theory, instrumentation and applications of flame photometry.

11) a) Discuss about the potentiometric titrations.

OR

b) Explain about the constant current and controlled potential electrolysis.

12) a) Explain the principle and technical details of solvent extraction. Write the applications of ion-exchange method.

OR

b) Explain:

i) Column

ii) Paper

iii) Thin layer chromatography methods.



(DCHE22)

M.Sc. (Final) DEGREE EXAMINATION, DECEMBER – 2015

Second Year

CHEMISTRY

Paper - VI : Inorganic Chemistry

Time : 3 Hours

Maximum Marks: 80

SECTION -A

(4 × 8 = 32)

Answer any four Questions

- 1) Explain the separation methods of lanthanides?
- 2) Compare Lanthanides and Actinides?
- 3) Explain the basic instrumentation of X-ray Diffraction.
- 4) Explain the application of IR spectroscopy in structural elucidation of inorganic complexes.
- 5) Discuss the Hyperfine splitting with examples.
- 6) Explain the Faraday method used for the structural determination of inorganic compounds.
- 7) Give an account on Metal toxicity.
- 8) Describe the mechanism of oxygen transformation.

SECTION -B

(4 × 12 = 48)

Answer All Questions

- 9) a) What are Transuranium elements? Describe the details of synthesis of it.

OR

- b) Write a detailed note on the colour and spectra of lanthanides and actinides.

10) a) Explain the principle, basic instrumentation and applications of Raman spectroscopy in structural elucidation of inorganic samples.

OR

b) Describe the basic instrumentation of X-ray diffraction. Explain its applications for the determination of a crystal structure.

11) a) What is the significance of 'g' factor? Describe the basic instrumentation and applications of ESR spectroscopy to simple compounds.

OR

b) Explain the formation of fragmentation patterns in M.S. with suitable examples.

12) a) Discuss about the Metalloenzymes in detail.

OR

b) Explain the following:

i) Haemoglobin.

ii) Myoglobin.



(DCHE23)

M.Sc. (Final) DEGREE EXAMINATION, DECEMBER – 2015

Second Year

CHEMISTRY

Paper - VII : Organic Chemistry

Time : 3 Hours

Maximum Marks: 80

SECTION -A

(4 × 8 = 32)

Answer any four questions

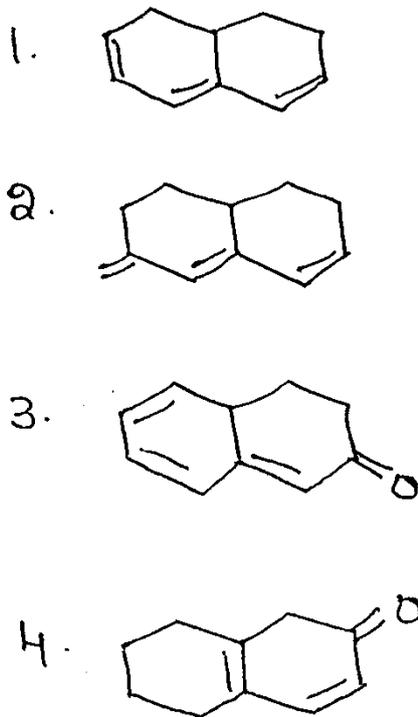
- 1) The position of absorption of acetone shifts in different solvents : 279 nm (hexane), 272nm (ethanol) and 264.5 (water). Explain.
- 2) How will you determine E and Z isomers with the help of IR spectroscopy?
- 3) Write a short on “Nuclear Overhauser Effect”.
- 4) Explain MC Lafferty rearrangement with suitable examples?
- 5) What is photo-Fries Rearrangement?
- 6) Explain the terms con Rotation and Dis Rotation.
- 7) Explain the stereochemistry of Morphine?
- 8) What is Curtius Rearrangement?

SECTION -B

(4×12 = 48)

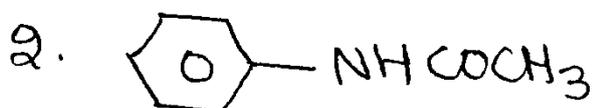
Answer All questions

- 9) a) i) Write the various electronic transitions in UV spectrophotometer?
ii) Calculate λ_{max} values for the following:



OR

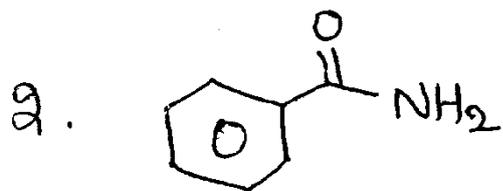
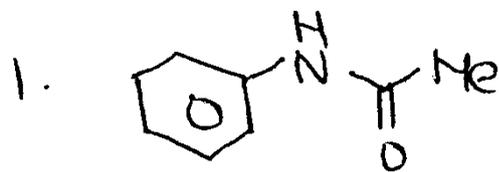
- b) i) Write notes on Fermi Resonance?
 ii) How do you distinguish the following compounds using IR spectroscopy?



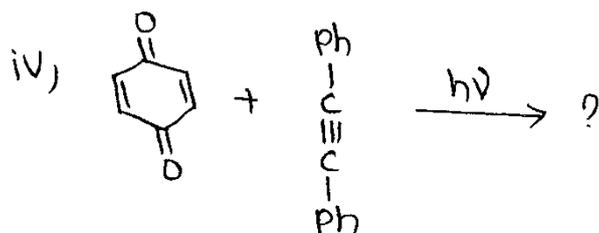
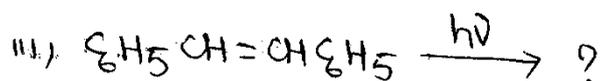
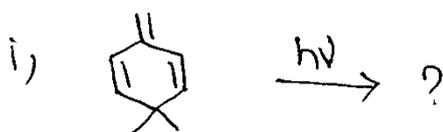
- 10) a) Define chemical shift and explain various factors which affect the magnitude of chemical shift?

OR

- b) i) Mention any two methods of Ion production in mass spectrometry and compare their relative advantages?
 ii) Give the Mass spectral fragmentation pattern for the following compounds.



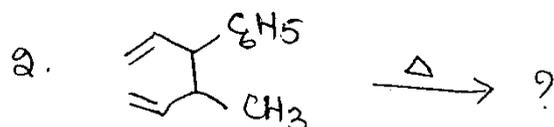
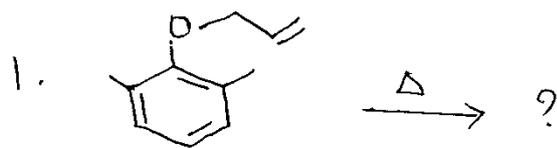
II) a) Predict the products for the following reactions.



OR

b) i) Write symmetry properties of π Molecular orbitals of 1, 3, 5 - hexatriene?

ii) Predict the products for the following reactions?



12) a) Write the synthesis of Atropine and Nicotine?

OR

b) Explain the following with Mechanism:

i) Schmidt Rearrangement.

ii) Baeyer-villiger oxidation.

iii) Favorskii Rearrangement.



(DCHE24)

M.Sc. (Final) DEGREE EXAMINATION, DECEMBER – 2015

Final Year

CHEMISTRY

Paper - VIII : Environmental Chemistry

Time : 3 Hours

Maximum Marks: 80

SECTION -A

(4 × 8 = 32)

Answer any four questions

- 1) Define the terms Pollutant and contaminant.
- 2) Write the functions of soil.
- 3) What are organic pollutants and explain their role in air pollution.
- 4) Write a brief note on Acid rain.
- 5) Write a brief note on composition of sea water.
- 6) Explain briefly about Radioactive waste pollution.
- 7) What is BOD? What is its significance?
- 8) What is the principle of Reverse osmosis?

SECTION -B

(4×12 = 48)

Answer All questions

- 9) a) i) Explain the Nomenclature in the study of Environmental chemistry.
ii) Explain the principle of Weathering.
- OR
- b) i) Write the factors effecting soil development.
ii) Explain the Determination of Total Nitrogen, and phosphorous in soil Analysis.

10) a) What are the sources of air pollutants and explain how they are emitted into the atmosphere with reference to oxides of sulphur and oxides of Nitrogen taking as examples?

OR

b) Write a note on the analysis of the following air pollutants: Ozone, Ammonia and Hydrocarbons.

11) a) i) Write a brief note on Hydrological cycle.

ii) What are the Water quality parameters.

OR

b) i) Describe the effects of soaps, Detergents pesticides with regard to water pollution.

ii) Write a brief note on the effects of the following pollutants.

1) Selenium

2) Oil

3) Lead

12) a) What are the common pollutant in water? and how do they pollute water? Describe briefly about continuous Monitoring of Water pollutants.

OR

b) How are BoD and CoD experimentally determined?

