

ASSIGNMENT - 1, DEC - 2016.

M.Sc. (FINAL) SECOND YEAR DEGREE

CHEMISTRY

PAPER - V : ANALYTICAL CHEMISTRY

Maximum : 30 MARKS

Answer ALL 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) Describe the instrumentation and principle of IR spectroscopy. Write its limitations.
- 6) Explain the determination of phosphate, iron and ammonia by using UV-visible spectrophotometer.
- 7) Explain the difference between Flame emission and Atomic absorption spectroscopy.
- 8) Explain the principle, theory, instrumentation and applications of flame photometry.

ASSIGNMENT - 2, DEC - 2016.

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CHEMISTRY

PAPER - V : ANALYTICAL CHEMISTRY

Maximum : 30 MARKS

Answer ALL questions.

- 1) Explain the principle and analytical applications of AAS.
 - 2) What are conductometric titrations. Draw and explain the titration curve of a complexometric titrations.
 - 3) Discuss about amperometric titrations.
 - 4) Explain about High Performance Liquid Chromatography(HPLC) with example.
 - 5) Discuss about the potentiometric titrations.
 - 6) Explain about the constant current and controlled potential electrolysis.
 - 7) Explain the principle and technical details of solvent extraction. Write the applications of ion-exchange method.
 - 8) Explain:
 - i) Column
 - ii) Paper
 - iii) Thin layer chromatography methods.
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CHEMISTRY

PAPER- VI : INORGANIC CHEMISTRY

Maximum : 30 MARKS

Answer ALL 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) What are Transuranium elements? Describe the details of synthesis of it.
 - 6) Write a detailed note on the colour and spectra of lanthanides and actinides.
 - 7) Explain the principle, basic instrumentation and applications of Raman spectroscopy in structural elucidation of inorganic samples.
 - 8) Describe the basic instrumentation of X-ray diffraction. Explain its applications for the determination of a crystal structure.
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M.Sc. (FINAL) SECOND YEAR DEGREE

CHEMISTRY

PAPER- VI : INORGANIC CHEMISTRY

Maximum : 30 MARKS

Answer ALL questions.

- 1) Discuss the Hyperfine splitting with examples.
 - 2) Explain the Faraday method used for the structural determination of inorganic compounds.
 - 3) Give an account on Metal toxicity.
 - 4) Describe the mechanism of oxygen transformation.
 - 5) What is the significance of 'g' factor? Describe the basic instrumentation and applications of ESR spectroscopy to simple compounds.
 - 6) Explain the formation of fragmentation patterns in M.S. with suitable examples.
 - 7) Discuss about the Metalloenzymes in detail.
 - 8) Explain the following:
 - i) Haemoglobin.
 - ii) Myoglobin.
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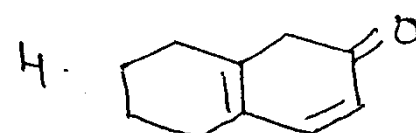
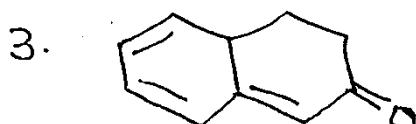
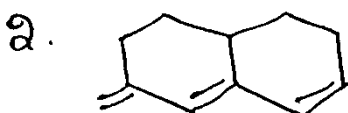
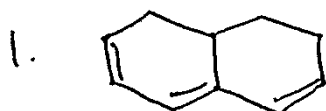
CHEMISTRY

PAPER- VII : ORGANIC CHEMISTRY

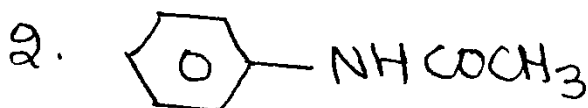
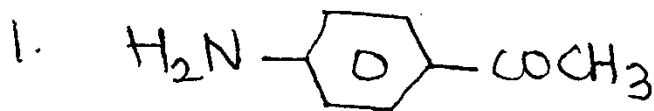
Maximum : 30 MARKS

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



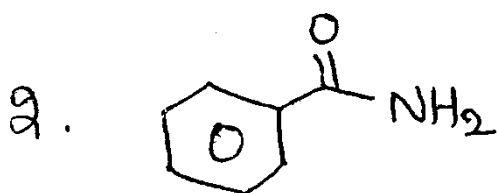
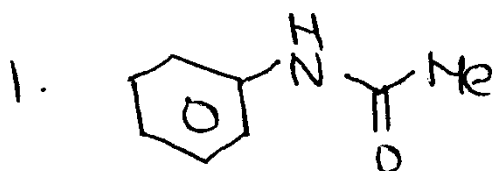
- 6) i) Write notes on Fermi Resonance?
ii) How do you distinguish the following compounds using IR spectroscopy?



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

- 8) 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.



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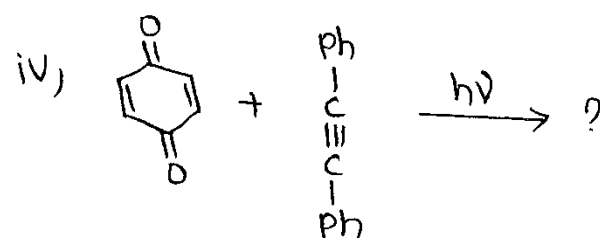
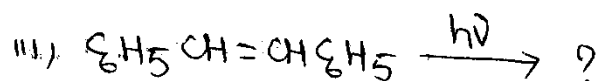
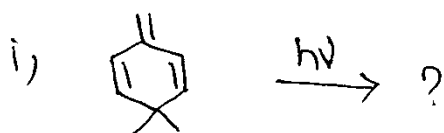
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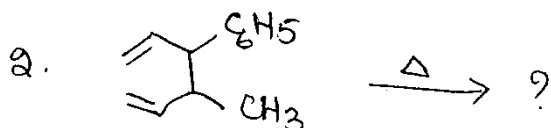
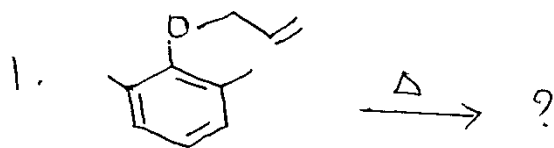
Maximum : 30 MARKS

Answer ALL questions.

- 1) What is photo-Fries Rearrangement?
- 2) Explain the terms con Rotation and Dis Rotation.
- 3) Explain the stereochemistry of Morphine?
- 4) What is Curtius Rearrangement?
- 5) Predict the products for the following reactions.



- b) i) Write symmetry properties of π Molecular orbitals of 1, 3, 5 - hexatriene?
ii) Predict the products for the following reactions?



7) Write the synthesis of Atropine and Nicotine?

8) Explain the following with Mechanism:

- i) Schmidt Rearrangement.
 - ii) Baeyer-villiger oxidation.
 - iii) Favorskii Rearrangement.
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CHEMISTRY

PAPER- VIII : ENVIRONMENTAL CHEMISTRY

Maximum : 30 MARKS

Answer ALL 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)
 - i) Explain the Nomenclature in the study of Environmental chemistry.
 - ii) Explain the principle of Weathering.
 - 6)
 - i) Write the factors effecting soil development.
 - ii) Explain the Determination of Total Nitrogen, and phosphorous in soil Analysis.
 - 7) 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?
 - 8) Write a note on the analysis of the following air pollutants: Ozone, Ammonia and Hydrocarbons.
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CHEMISTRY

PAPER- VIII : ENVIRONMENTAL CHEMISTRY

Maximum : 30 MARKS

Answer ALL questions.

- 1) Write a brief note on composition of sea water.
 - 2) Explain briefly about Radioactive waste pollution.
 - 3) What is BOD? What is its significance?
 - 4) What is the principle of Reverse osmosis?
 - 5)
 - i) Write a brief note on Hydrological cycle.
 - ii) What are the Water quality parameters.
 - 6)
 - 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
 - 7) What are the common pollutant in water? and how do they pollute water? Describe briefly about continuous Monitoring of Water pollutants.
 - 8) How are BoD and CoD experimentally determined?
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