(DCHE21)

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M.Sc.(Second) DEGREE EXAMINATION, MAY - 2017

(Second Year)

CHEMISTRY

Analytical Chemistry

Time: 3 Hours Maximum Marks: 70

Section - A

Answer any Four questions

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

- Q1) State and explain Beer's law. What are its limitations?
- **Q2)** Explain the instrumentation and working principle of nephelometry.
- **Q3)** Define fluorescence. Write the factors affecting fluorescence. Write the applications of Fluorimetry.
- **Q4)** Write the experimental procedure for flame photometry. Explain the possible errors in flame photometry.
- **Q5)** Draw and explain the conductometric titration curve of a strong acid and strong base.
- **Q6)** Write the principle and applications of electrogravimetry.
- **Q7)** Explain chelate and ion association system in solvent extraction with examples.
- **Q8)** Write about the oreparation of thin layer chromatographic plate (TLC). Explain the development methods in TLC.

Section - B

Answer all the questions choosing one from each unit

 $(4 \times 10 = 40)$

Unit-I

Q9) a) Describe the instrumentation and principles of Infra Red (IR) spectroscopy. Write the applications of IR spectroscopy for structure determination with examples.

OR

b) Describe the working principle of UV-visible spectroscopy. How do you determine stability constants by UV-visible spectroscopy

Unit-II

Q10) a) Describe the instrumentation, principle and applications of atomic absorption spectrophotometry.

OR

b) Explain the theory and working principle and basic instrumentation of fluorimetry.

Unit-III

Q11) a) Write the theory and working principle of potentio metric techniques. Explain its applications in precipitation reactions.

OR

b) Describe the instrumentation, principle and applications of polarography.

Unit-IV

Q12) a) Explain the instrumentation, principle and applications of HPLC

OR

b) What are Ion-Exchangers? Explain the action of Ion-Exchangers and write their analytical applications.



(DCHE22)

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M.Sc.(Second) DEGREE EXAMINATION, MAY - 2017

(Second Year)

CHEMISTRY

Inorganic Chemistry

Time: 3 Hours Maximum Marks: 70

SECTION - A

Answer any Four questions

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

- **Q1)** Describe the synthesis of transuranium elements?
- **Q2)** Describe the general properties of actinides?
- **Q3)** What is intensity of transition?
- **Q4)** Explain the diffraction by single crystal?
- **Q5)** Describe the applications of NMR spectroscopy?
- **Q6)** Explain the significance of 'g' factor?
- **Q7)** Describe the classification essential elements?
- **Q8)** Write notes on sodium pump?

SECTION - B

Answer all questions

 $(4 \times 10 = 40)$

Q9) a) Electronic configurations of lanthanides and actinides?

OR

- b) Describe the magnetic properties of lanthanides and actinides?
- Q10) a) Describe the basic instrumentation of x-ray diffraction?

OR

- b) Discuss the principal and instrumentation of raman spectroscopy?
- **Q11)** a) Explain the structure of some inorganic compounds by NMR spectroscopy?

OR

- b) Describe the principle and instrumentation of mass spectroscopy?
- Q12) a) Explain the following
 - i) Role of essential elements
 - ii) Metal DNA interactions.

OR

b) Describe the models for oxygen binding synthetic oxygen carries?



(DCHE23)

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M.Sc.(Second) DEGREE EXAMINATION, MAY - 2017

(Second Year)

CHEMISTRY

Organic Chemistry

Time: 3 Hours Maximum Marks: 70

Section - A

Answer any Four questions

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

- **Q1)** Write a note on Fieser-woodward rules for conjugated dienes.
- **Q2)** Describe effect of hydrogen bonding in IR spectroscopy.
- **Q3)** Explain nuclear over Hauser effect with an example.
- **Q4)** Write about factor's affecting fragmentation in mass spectroscopy.
- **Q5)** Explain photo chemistry conjugated olefins.
- **Q6)** Briefly explain methods of analysis in pericyclic reactions.
- **Q7)** Explain isolation to terpeneol.
- **Q8)** Write the mechanism and migratory aptitude of Beckmann rearrangement.

Section - B

Answer all questions

 $(4 \times 10 = 40)$

Unit - I

- **Q9)** a) Calculate λ_{max} values of the following
 - i)

ii)





OR

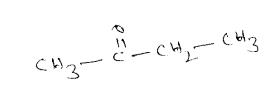
- b) Explain the following
 - i) Fermi resonance
 - ii) Combination bands.

<u>Unit - II</u>

- **Q10)** a) Predict the set of protons and H¹NMR values of the following
 - i)







OR

- b) Explain the following
 - i) Molecular ion
 - ii) Mc Lafferts rearrangement

<u>Unit - III</u>

Q11) a) Explain Norrish-I and Norrish-II reactions.

OR

b) Sketch the correlation diagrams for $4n\ \pi$ electron of a system under thermal and photochemical conditions.

<u>Unit - IV</u>

Q12) a) Illucidate the structure and synthesis of morphine.

OR

- b) Explain the following
 - i) Wagner-Meerwin rearrangement
 - ii) Neber rearrangement



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M.Sc.(Second) DEGREE EXAMINATION, MAY - 2017

(Second Year) CHEMISTRY

Environmental Chemistry

Time: 3 Hours Maximum Marks: 70

Section - A

Answer any Four questions

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

- **Q1)** Write the principles of weathering.
- **Q2)** Explain the factors affecting soil development.
- **Q3)** How do you analyze carbon monoxide in air polluted sample?
- Q4) What are the causes for acid rains and write the consequences of acid rains.
- **Q5)** Explain water sphere
- **Q6)** How do you determine nitrites in water samples?
- Q7) Write the working principle and applications of pollution monitoring instruments.
- **Q8)** Explain the principle and applications of reverse osmosis

Section - B

Answer all the questions choosing one from each unit

 $(4 \times 10 = 40)$

Unit-I

Q9) a) Write the determination of total nitrogen in soil samples.

OR

b) Explain the nomenclature in the study of environmental chemistry.

Unit-II

Q10) a) How do you determine the oxides of nitrogen in air samples?

OR

b) Explain air pollution due to particulate matter and photochemical smog.

Unit-III

Q11) a) Explain hydrological cycle in detail

OR

b) Discuss the water pollution due to agricultural wastes and thermal wastes

Unit-IV

Q12) a) How do you determine BOD in water samplies?

OR

b) Explain the primary treatment methods of water. Write the water quality parameters of drinking water.

