

(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 × 7½ = 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 preparation of thin layer chromatographic plate (TLC). Explain the development methods in TLC.

Section - B

Answer all the questions choosing one from each unit

(4 × 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 potentiometric 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.



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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 × 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 principle 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?



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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 × 7½ = 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.

Unit - III

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.

Unit - IV

Q12) a) Illustrate 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 × 7½ = 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 × 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 samples?

OR

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

