

(DCHE01)

Total No. of Questions : 12]

[Total No. of Pages : 02

M.Sc. (Previous) DEGREE EXAMINATION, MAY– 2018

First Year

CHEMISTRY

General Chemistry

Time : 3 Hours Maximum Marks :70

SECTION - A

Answer any four of the following questions. (4 x 7¹/₂ = 30)

- Q1)** Explain sources of radiations used in molecular spectroscopy.
- Q2)** Write the important components and basic principle of NMR spectroscopy.
- Q3)** By taking an example, explain the electronic spectrum of a diatomic molecule.
- Q4)** By taking as example, explain the rotational spectrum of a diatomic molecule .
- Q5)** Explain student 't' test.
- Q6)** How do you collect gaseous samples for analysis in atmosphere?
- Q7)** Write the important components and their functions of a micro computer.
- Q8)** Write a program for solving van der waals' equation.

SECTION - B

Answer all of the following questions. Choosing one from each unit.

(4 x 10 = 40)

Unit - I

- Q9)**a) Write about the interaction of radiation with matter in molecular spectroscopy.
- OR
- b) Write the important components, working principle and applications of ESR Spectroscopy.

(DCHE01)

Unit - II

Q10)a) Explain the classification of bands in UV and visible spectroscopy with suitable examples.

OR

b) Write about various sources and detectors used in different regions of infrared spectroscopy. Give the applications of IR spectroscopy.

Unit - III

Q11)a) How do you evaluate random errors by following statistical procedures.

OR

b) Write about the collection of different liquid samples for analysis. What are the precautions to be taken in the preservation of samples.

Unit - IV

Q12)a) Explain READ and WRITE with I, F, E formats.

OR

b) Write a programme and flow chart for rate constant of a first order reaction.



(DCHE02)

Total No. of Questions :12]

[Total No. of Pages : 02

M.Sc. (Previous) DEGREE EXAMINATION, MAY– 2018

First Year

CHEMISTRY

Inorganic Chemistry

Time :3 Hours Maximum Marks :70

SECTION - A

Answer any four of the following questions.(4 x 7¹/₂ = 30)

- Q1)** Explain photoelectric effect.
- Q2)** Explain wave function and its physical interpretation.
- Q3)** Write the postulates of valence bond theory. Explain bonding in H₂ molecule according to V.B. Reory.
- Q4)** Explain born Haber cycle.
- Q5)** Write about splitting of 'd' orbitals in tetrahedral complexes by taking an example.
- Q6)** Draw and explain the Orgel diagram of a complex with an example.
- Q7)** Explain the synthesis and properties of diborane.
- Q8)** By taking an example, explain the inner sphere mechanism.

SECTION - B

Answer all of the following questions.

Choosing one from each unit.(4 x 10 = 40)

UNIT - I

- Q9)** a) Explain schrodinger wave equation for an electron in a box.

OR

- b) Discuss the atomic spectra of alkali metals.

(DCHE02)

UNIT - II

Q10)a) Give an account on LCAO approach and explain bonding with suitable examples.

OR

b) Write the properties and applications of molecular crystals and covalent crystals.

UNIT - III

Q11)a) How do you determine the stability constants of a complex by pH metric method?

OR

b) How do you explain the magnetic and color of transition metal ions?

UNIT - IV

Q12)a) Write about classification of labile and inert complexes according to crystal field theory. Give examples.

OR

b) Write the synthesis, properties and structure of silicones.



(DCHE03)

Total No. of Questions : 12]

[Total No. of Pages : 02

M.Sc. (Previous) DEGREE EXAMINATION, MAY – 2018

First Year

CHEMISTRY

Organic Chemistry

Time : 3 Hours

Maximum Marks :70

SECTION - A

Answer any four questions.

(4 × 7½ = 30)

- Q1)** Explain about Aromaticity with examples.
- Q2)** Write a note on effect of conformation on reactivity in cyclohexane derivatives.
- Q3)** Explain structure and reactivity of carbocation and carbanions.
- Q4)** Explain the neighbouring group mechanism with examples.
- Q5)** Write a note on Gattermann – Koch reaction.
- Q6)** Explain the Sandmeyer reaction.
- Q7)** Explain addition of Grignard reagents to carbonyl and unsaturated carbonyl compounds.
- Q8)** Write a note on E₁ and E_{1CB} mechanism.

SECTION - B

Answer all questions.

(4 × 10 = 40)

- Q9) a)** Explain the following.
- i) Cross conjugation
 - ii) Resonance
- OR
- b) Explain about stereospecific and stereoselective synthesis.

(DCHE03)

Q10) a) Explain methods of determining mechanisms isotopic effects.

OR

- b) i) Explain SN^1 and SN^2 mechanism.
ii) Explain about SN^1 mechanism.

Q11) a) Write a note on generation and characteristics of free radicals.

OR

- b) i) Hydroboration
ii) Michael reaction

Q12) a) Explain the following:

- i) Knoevenagel
ii) Mannich
iii) Perkin reactions

OR

- b) Write a note on mechanism and orientation in pyrolytic elimination.



(DCHE04)

Total No. of Questions : 12]

[Total No. of Pages : 02

M.Sc. (Previous) DEGREE EXAMINATION, MAY – 2018

First Year

CHEMISTRY

Physical Chemistry

Time : 3 Hours

Maximum Marks :70

SECTION - A

Answer any four of the following questions. (4 × 7¹/₂ = 30)

- Q1)** Define entropy and write about entropy changes in isolated systems.
- Q2)** Describe classius Clayperon equation.
- Q3)** Explain the theory of α – decay by giving examples.
- Q4)** Write about schotky and Frenkel defects in crystals.
- Q5)** Define cell EMF and its measurement.
- Q6)** Write about micelles and reverse micelles.
- Q7)** Write the mechanism of homogeneous catalysis reaction with an example.
- Q8)** State and explain Laws of photochemistry.

SECTION - B

Answer all questions. Choosing one from each unit. (4 × 10 = 40)

Unit - I

- Q9)** a) Write about partial molar quantities and Van't Hoff's equation.
OR
b) Derive thermodynamic phase rule.

Unit - II

- Q10)** a) Write the principle and applications of Isotope dilution analysis and radiometric titrations.
OR
b) Explain Miller indices and labelling of planer.

(DCHE04)

Unit - III

Q11) a) How do you determine cell concentration without transference?

OR

b) Explain specific conductance and equivalent conductance. Write about their variation with concentration.

Unit - IV

Q12) a) Write Lindmann's theory of reaction rates.

OR

b) Define quantum yield of a photochemical reaction and reactional with high and low quantum yields.

