

(DCHE01)

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

(First Year)

CHEMISTRY

General Chemistry

Time : 3 Hours

Maximum Marks : 70

Section - A

Answer any Four questions

(4 × 7½ = 30)

- Q1)** Explain the nature of radiation and their Quantization of energy in molecular spectroscopy.
- Q2)** Explain the basic instrumentation and working principle of electron spin resonance spectroscopy (ESR).
- Q3)** By taking a suitable, explain the electronic spectra of a diatomic molecule in UV visible spectroscopy.
- Q4)** Write about the radiation sources and detectors used in Intra Red spectroscopy.
- Q5)** Write the basic steps involved in the collection of water samples for analysis.
- Q6)** Explain student 't' test and its significance.
- Q7)** Explain the basic components of a computer and their functions.
- Q8)** What do you understand by IF and GOTO statements?

Section - B

Answer all questions choosing one from each unit

(4 × 10 = 40)

Unit-I

Q9) a) Explain the theory, instrumentation and working principle of nuclear magnetic resonance spectroscopy (NMR).

OR

b) By taking suitable examples, explain the microwave spectra of linear molecules.

Unit-II

Q10) a) By taking suitable examples, explain the vibrational spectra of diatomic molecules in Infra Red (IR) spectroscopy.

OR

b) Discuss the rotational fine structure of electronic vibration transitions.

Unit-III

Q11) a) Explain the importance of control charts in the analysis of data.

OR

b) Explain the method of least square analysis with an example.

Unit-IV

Q12) a) Write a flow chart and computer program for solving Vander Waal's equation.

OR

b) Write a flow chart and computer program for summing power series.



(DCHE02)

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

First Year

CHEMISTRY

Inorganic Chemistry

Time : 3 Hours

Maximum Marks : 70

PART - A

Answer any Four questions

(4 × 7½ = 30)

- Q1)** Explain what is planck's temperature radiation law?
- Q2)** Explain the wave equation for hydrogen?
- Q3)** Write notes on valence bond approach to H₂ molecule?
- Q4)** Discuss the types of solids?
- Q5)** What are the outer and inner orbital complexes?
- Q6)** Explain the elementary ideas on magnetism?
- Q7)** Describe the classification of labile and inert complexes on valence bond theories?
- Q8)** Explain the properties and structure of boranes?

PART - B

Answer all questions

(4 × 10 = 40)

- Q9)** a) What is Heisenberg's uncertainty principle and explain electron in box?
- OR
- b) What is L-S and J-J coupling schemes and explain the atomic spectra of alkali metals?

Q10) a) Discuss the concept of hybridization and explain the different types of hybridization?

OR

b) Explain the simple ionic structures based on the concept of radius ratio?

Q11) a) Explain the crystal field splitting of d orbital's in octahedral complexes?

OR

b) Explain the determination of stability constants of complexes by pH method?

Q12) a) Explain the following

- i) Ligand substitution in octahedral complexes
- ii) Electron transfer reactions.

OR

b) Describe the synthesis, properties and structure of B-N, S-N, P-N cyclic compounds?

(DCHE03)

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

(First Year)

CHEMISTRY

Organic Chemistry

Time : 3 Hours

Maximum Marks : 70

SECTION - A

Answer any Four questions

(4 × 7½ = 30)

Q1) Write a note on hyper conjugation give examples.

Q2) Explain conformations of ethane.

Q3) Draw the potential energy diagrams for transition states and intermediate states with an example

Q4) Write a note on ambident nucleophiles give examples.

Q5) Discuss diazonium coupling reaction with an example.

Q6) Explain the following

- a) Auto-oxidation
- b) Hunsdiecker reaction.

Q7) Explain hydrolysis of esters and amides.

Q8) Write a note on E₂ and E₁ reactions with an example.

SECTION – B
Answer all questions

(4 × 10 = 40)

Unit-I

Q9) a) Explain the following

- i) Fullerence
- ii) Huckel's rule

OR

b) Write the conformations of cyclohexane derivatives

Unit-II

Q10) a) Explain generation, structure, stability and reactivity of carbocation and carbanion

OR

b) Write a note on

- i) Nucleophilic substitution at aliphatic trigonal carbon
- ii) SNⁱ reaction

Unit-III

Q11) a) Explain the following

- i) NBS
- ii) Chemoselectivity

OR

b) i) Free radical addition reactions

ii) Michael reaction

Unit-IV

Q12) a) Write a note on

- iii) Benzoin condensation
- iv) Perkin reaction.

OR

b) Explain factors affecting on elimination reactions.



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M.Sc. DEGREE EXAMINATION, MAY - 2017

(First Year)

CHEMISTRY

Physical Chemistry

Time : 3 Hours

Maximum Marks : 70

SECTION – A

(4 × 7½ = 30)

Answer any Four questions

- Q1)** Explain the significance and concept of Gibb's-Helmholtz function.
- Q2)** Write about the entropy changes in irreversible processes.
- Q3)** Explain Radioactive secular equilibrium and transient equilibrium with one example each.
- Q4)** Write about Schottky and Frenkel defects in solids.
- Q5)** How do you measure the emf of an electrochemical cell.
- Q6)** Draw and explain Langmuir adsorption isotherm.
- Q7)** Draw and explain Jablonsky diagram.
- Q8)** Explain the effect of temperature on reaction rates.

SECTION – B

(4 × 10 = 40)

Answer all the questions choosing one from each unit

Unit - I

Q9) a) Describe Classius-Clapeyron equation.

OR

b) Explain the variation of chemical potential with respect to temperature and pressure.

Unit - II

Q10) a) Write the applications of radioisotopes in reaction mechanisms and medicine.

OR

b) Make a comparison between the properties and applications of conductors and semiconductors.

Unit - III

Q11) a) Write the determination of concentration of a cell without transference.

OR

b) How do you determine surface area of solids by BET method?

Unit - IV

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

OR

b) Explain the mechanism of Acid-Base catalysis reaction with an example.

