

(DCHE01)

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M.Sc. (Previous) DEGREE EXAMINATION, DEC. – 2016

(First Year)

CHEMISTRY

General Chemistry

Time : 3 Hours

Maximum Marks : 70

Part – A

(4 × 7½ = 30)

Answer any four questions

- Q1)** Write the principles of NMR and ESR spectroscopy.
- Q2)** Describe the quantized energy levels of rigid rotor allowed transitions.
- Q3)** Discuss about Rotational fine structure of electronic vibration transitions.
- Q4)** Write a note on diatomic vibrating rotator.
- Q5)** Write about
- a) Control charts
 - b) Accuracy & precision
- Q6)** Explain propagation of errors
- Q7)** Write a note on Do statements.
- Q8)** Explain the List directed INPUT and OUTPUT statements

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Part – B
Answer all questions

(4 × 10 = 40)

- Q9)** a) Discuss :
- i) Spectra of rigid rotor
 - ii) Spectra of non – rigid rotor

OR

- b) Explain Rotational spectra of diatomic molecules and discuss the effect of isotopic substitution on rotation spectra.

- Q10)** a) Describe the vibrational and rotational spectra of diatomic molecules.

OR

- b) Explain the vibration spectra of an harmonic oscillator.

- Q11)** a) Discuss the theory of sampling and techniques involved in sampling.

OR

- b) Write a note on
- i) Minimization of errors
 - ii) F – Test
 - iii) Computation rules

- Q12)** a) Write the programme for Beer's law by least squares method

OR

- b) Draw the flow chart and write the programme for summing a power series.



(DCHE02)

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M.Sc. (Previous) DEGREE EXAMINATION, DEC. – 2016

First Year

CHEMISTRY

Inorganic Chemistry

Time : 3 Hours

Maximum Marks : 70

PART – A

(4 × 7½ = 30)

Answer any four questions

- Q1)** Describe the Planck's quantum theory.
- Q2)** Discuss orthogonality and normalization of wave functions.
- Q3)** Explain the approach of valence bond theory to H₂ molecule.
- Q4)** Describe VSEPR theory.
- Q5)** How do you determine the stability constants of complexes? Explain.
- Q6)** Discuss multiple bonding in complexes.
- Q7)** Write a note on Intercalation compounds.
- Q8)** Explain crystal field theories.

PART – B

(4 × 10 = 40)

Answer all questions

Q9) a) Describe the L. - S. coupling of angular momenta and J – J coupling.

OR

- c) Write a note on :
- Compton effect
 - Term symbols
 - Plank's temperature radiation law

Q10) a) Describe in detail about the types of solids.

OR

- c) Discuss :
- Comparison of valence bond and molecular orbital methods.
 - Different types of hybridization.

Q11) a) Write about

- Chelate effect.
- Spectrochemical series.
- CFSE

OR

- b) Discuss the John – Teller effect on genetics of Oh complexes. Explain with suitable example.

Q12) a) Discuss the synthesis, properties and structures of Silicates and Boranes.

OR

- c) Write a note on :
- Ligand substitution in octahedral complex.
 - Electron transfer reactions.



(DCHE03)

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M.Sc. (Previous) DEGREE EXAMINATION, DEC. – 2016

First Year

CHEMISTRY

Organic Chemistry

Time : 3 Hours

Maximum Marks : 70

Part – A

Answer any four questions

(4 × 7½ = 30)

Q1) Explain various methods of resolution.

Q2) Explain about optical purity and explain about optical activity of biphenyls, allens.

Q3) Explain about carbocations.

Q4) Explain about classical carbocations rearrangements.

Q5) Explain Diazonium coupling.

Q6) Explain Hunsdiekar reaction.

Q7) Explain E_{ICB} mechanism.

Q8) Explain about reduction reactions of carbonyl compounds.

Part – B

(4 × 10 = 40)

Unit - I

Q9) a) Explain with examples.

- i) Hyper conjugation
- ii) Anti - aromaticity
- iii) Homo aromaticity

OR

- b) Explain
 - i) Stereo selective synthesis
 - ii) Conformations of mono & di substituted cyclohexanes.

Unit - II

- Q10)** a) Explain generation and stabilities of carbanions and free radicals.

OR

- b) Explain SN_1 & SN_2 mechanisms in detail.

Unit - III

- Q11)** a) Explain
 - i) Arylation of Aromatics by diazonium salts
 - ii) Explain Hydration reaction in detail

OR

- b) Explain
 - i) Allylic halogenation
 - ii) Auto - oxidation
 - iii) Free radical re - arrangement

Unit - IV

- Q12)** a) Explain about Aldol reaction and Benzoin condensation in detail.

OR

- b) Explain about various factors effecting various elimination reactions.



(DCHE04)

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M.Sc. (Previous) DEGREE EXAMINATION, DEC. – 2016

First Year

CHEMISTRY

Physical Chemistry

Time : 3 Hours

Maximum Marks : 70

SECTION – A

Answer any four question

(4 × 7½ = 30)

- Q1)** State second law of Thermodynamics and write its applications.
- Q2)** Derive Thermodynamic Raoult's law
- Q3)** Explain the principle and applications of scintillation counters.
- Q4)** Explain the mechanism of nuclear reactions
- Q5)** Explain the properties and applications of insulators.
- Q6)** Explain Miller indices
- Q7)** Define Transportnumber. How do you determine Transport number of an electrolyte?
- Q8)** Explain Lindemann's Theory of reaction rates.

SECTION – B

(4 × 10 = 40)

Answer all questions

Q9) a) Explain partial molar Quantities.

OR

b) Discuss the entropy changes in isolated systems in reversible processes.

Q10) a) Write the applications of radio isotopes in Medicine, agriculture and industry.

OR

b) State and explain Bragg's equation and Bravis Lattices

Q11) a) How do you determine the emf of a cell without Transference.

OR

b) What are Micelles and reverse Micelles? Explain their properties and mechanism of action

Q12) a) Explain the phenomenon of Fluorescence and phosphorescence. Write about Quantum yield of a photochemical reactions.

OR

b) Write about the absolute theory of reaction rates.

