

B.Sc. DEGREE EXAMINATION
DECEMBER 2020

First Year

Chemistry

GENERAL CHEMISTRY -I

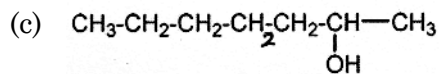
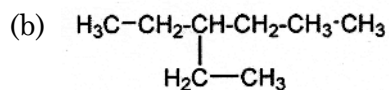
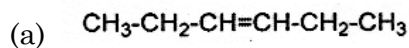
Time : 3 hours

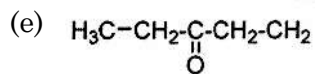
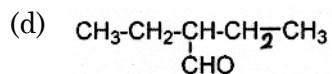
Maximum marks : 75

PART A — (3 × 5 = 15 marks)

Answer any THREE questions

1. Give IUPAC name for the following organic compounds





2. (a) Write the structure of the following compounds
- (i) 1-aminopropan-2-ol
 - (ii) 2-Methylthiophene
- (b) What are the conditions for the resonance?
3. Write short notes on rows and periods in the periodic table.
4. What is polarizing power and polarizability of atoms?
5. Write short notes on viscosity and surface tension.

PART B — (4 × 15 = 60 marks)

Answer any FOUR questions.

6. (a) How the organic compounds classified based on the C and H atoms?
- (b) State the IUPAC rules for naming aliphatic compound containing aldehydes and acids.
7. Write short notes on the followings
- (a) Resonance effect
 - (b) Hyperconjugation
 - (c) Steric effect

8. Give an account for the followings
- (a) Atomic radii
 - (b) Bond angle
 - (c) Bond length
9. (a) What are the factors that favoring the ionic compounds?
- (b) Explain London forces and van-der Waals forces.
10. Write short notes on Liquid crystals and its applications.
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B.Sc. DEGREE EXAMINATION – DECEMBER 2020**First Year****Chemistry****GENERAL CHEMISTRY –II****Time: 3 Hours****Maximum Marks: 75****PART- A****(3 × 5 = 15 Marks)****Answer any THREE questions**

1. Write similarities and difference between valence bond and molecular orbital theories.
2. Discuss the mechanism and stereochemistry of E₂ reaction.
3. Define viscosity. What is the influence of temperature on viscosity?
4. a) What is called a fertilizer?
b) Elaborate the role of elements in plant growth.
5. a) State carbanions and carbocations. Give examples.
b) Write down the general methods of preparing alkynes.

PART- B**(4 × 15 = 60 Marks)****Answer any FOUR questions**

6. a) What is quantum numbers? Describe its types with examples.)
b) Write a note on Pauli Exclusion Principle.
c) Explain the shapes of the BeF₃ and PCl₅ molecules using VSEPR theory.
7. Discuss the following reactions)
a) 1,3-dipolar addition b) Hydroboration c) Benzoin condensation
8. a) Write a note on i) Surface tension ii) Refraction.
b) Describe the various types and applications of liquid crystals.
9. Explain the following
a) Inorganic pesticides b) Petrochemicals c) Synthetic gasoline.
10. a) Outline the methods available for the preparation of alkene.
b) Discuss the following addition reactions of alkene
i) Hydroxylation ii) Ozonolysis iii) Epoxidation.
c) Explain Diel's-Alder reaction.

UG-C-465

BCHE -21

B.Sc. DEGREE EXAMINATION – DECEMBER 2020.

FIRST YEAR

CHEMISTRY

GENERAL CHEMISTRY –III

Time: 3 hours

Maximum marks: 75

PART-A

(3 × 5 = 15 Marks)

Answer any THREE questions

1. a) Explain the anomalous behavior of beryllium. (3+2)
b) Find out the oxidation state of sodium in Na_2O_2 .
2. Discuss the aluminium extraction from its ore. (5)
3. Explain the following: (3+2)
a) Ziegler alkylation Reaction b) Chichibabin Reaction
4. a) Write the difference between order and molecularity of a reaction. (3+2)
b) Give any one example for zero order reaction.
5. a) Define isoprene rule. (2+3)
b) Describe the classification of terpenoids

PART-B

(4 × 15 = 60 Marks)

Answer any FOUR questions.

6. a) Discuss the preparation and properties of the following compounds of alkaline metals
i) Oxides ii) Carbonates iii) Nitrates. (3+3+3+6)
b) Write a note on complexes of s block elements.
7. a) List down the general characteristics of group III A elements (5+5+5)
b) Discuss the following
i) Allotropic forms of carbon ii) Structures of silicates

8. Describe the following reactions (5+5+5)
a) Friedal's Craft's alkylation b) Gattermann-Koch c) Vilsmeier Haack
9. a) Derive the rate constant for first order reaction. (6+6+3)
b) Discuss the collision theory for bimolecular reactions.
c) How does temperature affect reaction rate?
10. a) Discuss the general methods of determining the structure of alkaloids. (5+4+6)
b) Explain the synthesis of citral.
c) How will establish the structure of piperic acid?

B.Sc. DEGREE EXAMINATION – DECEMBER – 2020

CHEMISTRY

SECOND YEAR

GENERAL CHEMISTRY - IV

Time : 3 Hours

Maximum Marks : 75

PART – A

(3 x 5 = 15 Marks)

Answer any THREE questions:

1. Write short notes on calcinations and roasting. (5)
2. Write the uses of ultrasound in green synthesis. (5)
3. Write the preparation of nitrogen and write its any two chemical reaction. (5)
4. What is Lanthanide contraction? (5)
5. Write short notes on vitamin 'A' (5)

PART – B

(4 X 15 = 60 Marks)

Answer any FOUR questions:

6. Explain froth floatation, calcinations and roasting. (5+5+5)
7. Write any five principles of green chemistry with examples (15)
8. What are the general characteristics of halogens. (15)
9. Compare Lanthanides and actinides. (15)
10. Write briefly about antibiotics. (15)

UG-C-557

BCHE-31

UG DEGREE EXAMINATION - DECEMBER - 2020

CHEMISTRY

Third Year

INORGANIC CHEMISTRY

Time: 3 Hours

Maximum Marks: 75

PART A (3 × 5 = 15 Marks)

Answer any **THREE** questions.

1. Explain the following terms
 - (a) Draw the structures of sodium chloride, Wurtzite
 - (b) Bravais lattices
2. What is EAN rule? Calculate EAN for
 - a) $[\text{Co}(\text{NH}_3)_6]^{3-}$
 - b) $[\text{Fe}(\text{CN})_6]^{3-}$
3. Write a short note on
 - a) Binding energy
 - b) Magic numbers
4. Define the followings with a suitable example. (a) Protic solvent (b) Aprotic solvent (c) Aqueous solvent (d) Non-aqueous solvent (e) Ionising solvent
5. Prepare organoboron compounds and write its uses.

PART B ($4 \times 15 = 60$ Marks)

Answer any FOUR questions.

6. Write a short note on the following : (7 + 4 + 4)
- (a) Derive Born equation.
 - (b) Schottky defect.
 - (c) Frenkel defect.
7. (a) Explain optical isomerism in octahedral coordination compounds (10 + 5)
- (b) Discuss the application of chelates in medicine.
8. (a) Explain N/P ratio. (6 + 6 + 3)
- (b) Discuss Geiger Muller counter.
 - (c) Discuss the applications of nuclear science in biology.
9. (a) Discuss the chemical reactions of acetic acid. (5 + 5 + 5)
- (b) Explain Bronsted-Lowry theory for acid and base.
 - (c) Explain Henderson equations.
10. (a) What is 16- electron rule? (3 + 12)
- (b) Write a note on Wilkinson's and Ziegler-Natta catalysts.
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BCHE-32

**B.Sc. DEGREE EXAMINATION –
DECEMBER - 2020**

CHEMISTRY

Third Year

ORGANIC CHEMISTRY

Time: 3 Hours

Maximum Marks: 75

PART A ($3 \times 5 = 15$ Marks)

Answer any **THREE** questions.

1. Describe the Skraup synthesis of Quinoline.
2. Explain the following.
 - a) Enantiomer
 - b) Diastereomer
 - c) Epimers
3. Explain cis, trans and E-Z notations with suitable examples.

4. a) Write the Fries rearrangement.
- b) Write the mechanism of benzidine rearrangement.
5. Explain the basic principle of Mass spectrometry.

PART B ($4 \times 15 = 60$ Marks)

Answer any FOUR questions.

6. Sketch and explain the primary, secondary and tertiary structure of proteins.
7. Explain various inter translation representation of molecules (any five like Fischer to Sawhorse).
8. Explain the conformational analysis of ethane, n-butane, 1,2-glycol, cyclopentane and cyclohexane.
9. Complete the following equations: (5+2+3+5)
 - a)
 - b)

c)

d)

10. a) What are the significances of TMS? (3+8+4)
- b) Explain the theory behind electronic spectroscopy.
- c) Enumerate the applications of electronic spectroscopy for conjugated molecules.
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B.Sc. DEGREE EXAMINATION –
DECEMBER - 2020

CHEMISTRY

Third Year

PHYSICAL CHEMISTRY

Time: 3 Hours

Maximum Marks: 75

PART A ($3 \times 5 = 15$ Marks)

Answer any THREE questions.

1. Derive Gibbs-Helmholds equation.
2. Explain various symmetry elements present in the H_2O molecule and prepare the group multiplication table for H_2O molecule.
3. Write a brief note on calomel electrode.
4. Explain the electrical double layer phenomenon of colloids.
5. Write the principle behind vibrational spectra.

PART B ($4 \times 15 = 60$ Marks)

Answer any FOUR questions.

6. Explain Carnot's cycle and its efficiency. (12 + 3)

7. a) Describe the concept of freezing point depression. (10 + 5)

b) An aqueous solution containing 0.25 g of solute dissolved in 20 g of water froze at -0.42 °C. Calculate the molar mass of solute using freezing point depression; $K_f = 1.84$ K kg mol⁻¹

8. What are fuel cells? Discuss about the Hydrogen-Oxygen fuel cell and its application (2+10+3)

9. Explain chemical synthetic methods of any three nanoparticles and their applications (5+5+5)

10. How do you explain the IR spectroscopy of H₂O and CO₂

B.Sc. DEGREE EXAMINATION – DECEMBER 2020**First Year****Chemistry****GENERAL PHYSICS**

Time: 3 hours

Maximum marks: 75

PART A — (3 × 5 = 15 marks)

Answer any THREE questions

1. Define SHM. Deduce the differential equation for simple harmonic motion.
2. Describe the experimental method to determine the poisson's Ratio for rubber.
3. State and explain the Gauss theorem.
4. Obtain the balance condition for Wheatstone bridge.
5. Draw and explain the characteristics curve of Zener diode.

PART B — (4 × 15 = 60 marks)

Answer any FOUR questions

6. Define Reverberation time and absorption coefficient. Derive the Sabine formula for the determination of reverberation time.
7. (a) Explain the isothermal and adiabatic process.
(b) State and explain the Newton's law of cooling.
8. State Raman Effect. Describe the experimental detail of Raman Spectrometer. What are its applicatons?
9. State the laws of electromagnetic induction. Deduce the conditions for self-induction and mutual induction of coils.
10. (a) Explain how the NAND gate act as Universal logic gate.
(b) State and explain the De Morgan's theorem.

**B.Sc. DEGREE EXAMINATION –
DECEMBER 2020**

Second Year

Chemistry

ANIMAL DIVERSITY

Time : 3 hours

Maximum marks : 75

SECTION A — (3 × 5 = 15 marks)Answer any **THREE** questions.

1. What is animal diversity? Give scientific classification of animals.
2. Describe the morphology of earthworm.
3. Write about star fish indicating its systematic position.
4. Describe the parts of frog digestive system.
5. Explain the structure of Pigeon's brain with neat sketch.

SECTION B — (4 × 15 = 60 marks)Answer any **FOUR** questions.

6. What are the major invertebrate phyla? Discuss any two with an example.
7. Explain the ultrastructure of paramecium.
8. Give a detailed account on cephalic appendages of prawn.
9. Write detailed notes on circulatory system of calotes.
10. Elaborate the urinogenetal system of male rabbit.