


**SECTION – A****Answer ALL Questions :****(10 × 1 = 10)**

- The empirical formula of a monobasic acid containing C = 40%, H = 6.67% and having equivalent weight 60 is _____.
a) C₂H₆O₂ b) CH₂O c) C₂H₆O₆ d) None of these
- Geometrical isomerism is shown by _____.
a) lactic acid b) maleic acid
c) 1-butane d) 1,1-Dichloroethylene
- A carbon compound containing C=C generally under goes _____ type of reaction
a) substitution b) addition c) elimination d) rearrangement
-  are
a) resonating structures b) tautomers
c) geometrical isomers d) optical isomers
- The number of σ bonds and π bonds in a methane molecule respectively are _____.
a) 4,0 b) 3,2 c) 2,3 d) 1,1
- The order of stability of a carbanion is _____.
a) 3⁰>2⁰>1⁰ b) 2⁰>1⁰>3⁰ c) 2⁰>3⁰>1⁰ d) 1⁰>2⁰>3⁰
- The enzyme which can catalyse the conversion of glucose to ethanol is
a) maltase b) diastase c) invertase d) zymase

8. The substances which initiate a photochemical reaction but itself does not undergo any chemical change is called _____.
 a) catalysis b) sensitizer c) quantum yield d) fluorescent
9. The quantity of chemicals in each litre of solution is known as _____.
 a) formula weight b) strength
 c) molecular weight d) equivalent weight
10. The number of moles of a solute per kilogram of the solvent is called
 a) molefraction b) normality c) molarity d) molality

SECTION – B

Answer any FIVE Questions :

(5 × 2 = 10)

11. What is the relation between Empirical formula and Molecular formula?
12. Define Electrophile. Give one example.
13. Draw the geometry of methane and state its hybridization.
14. What do you mean by autocatalysis?
15. How will you prepare 1N solution of NaOH?
16. Define Bioluminescence.
17. Name one example each for primary and secondary standards used in titrimetry.

SECTION – C

Answer ALL Questions :

(5 × 5 = 25)

18. a) A compound has the following percentage composition. Calculate its empirical formula 65.45 % C 5.493 % H 29.06 % O
(OR)
 b) Summarize the various types of structural isomerism.

19. a) Define Tautomerism. How does tautomerism differ from resonance.
(OR)

b) Explain nucleophilic reagent and their types with example.

20. a) Illustrate the tetrahedral arrangement of carbon in methane.
(OR)

b) Compare homolytic and heterolytic fission.

21. a) Explain the following i) Catalytic promoters
 ii) Catalytic poisoning
(OR)

b) Explain Enzyme Catalysis and its characteristics.

22. a) Define the following i) Normality
 ii) Molarity
(OR)

b) Enumerate the process of standardizing the secondary standard solution.

SECTION – D

Answer any THREE Questions :

(3 × 10 = 30)

23. i) Explain the cis- & trans – isomerism of alkenes.
 ii) Write a note on optical isomerism in lactic acid.
24. Discuss the types of organic reactions.
25. Explain the formation and stability of carbocation and carbanion.
26. Draw Jablonski diagram and explain the photophysical processes.
27. Write a note on principle of titrimetry.





VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

(Autonomous & Residential)

[Affiliated to Madurai Kamaraj University]

B.Sc. Physics Degree (Semester) Examinations, November 2018

Part – III : Allied Subject : First Semester : Paper – I

CHEMISTRY FOR PHYSICIST – I

Under CBCS – Credit 4

Time: **3** Hours

Max. Marks: **75**

SECTION – A

Answer ALL Questions :

(10 × 1 = 10)

- The energy of an electron in Bohr's atom _____ as we move away from the nucleus
 a) remains the same b) decreases
 c) increases d) sometimes increases, sometimes decrease
- According to Pauli's exclusion principle two electrons can occupy the same orbital only if they have _____ direction of spin
 a) different b) same c) similar d) none of these
- The free rotation is not possible in
 a) delta bond b) Coordinate bond c) pi bond d) Sigma bond
- sp³ hybridization leads to
 a) Trigonal geometry with bond angles 120° each
 b) Tetrahedral geometry with bond angles 109.5° each
 c) Tetrahedral geometry with bond angles 90° each
 d) Square planar geometry with bond angles 90° each
- When a chemical bond between two atoms is formed, the potential energy of the system
 a) Decreases b) Increases
 c) Remains the same d) Cannot be predicted
- The lattice enthalpy of sodium chloride is
 a) – 886 kJ/mol b) – 986 kJ/mol
 c) – 406 kJ/mol d) – 786 kJ/mol

7. A nucleus becomes increasingly unstable when
- there are more protons than electrons
 - there are more protons than alpha particles
 - there are more neutrons than protons
 - it decays alpha particles from the nucleus
8. Which of the following statements is true for a ^{14}C ?
- it has 6 protons and 6 neutrons
 - it has 12 protons and 12 neutrons
 - it has 12 protons and 8 neutrons
 - it has 6 protons and 8 neutrons
 - none of the above
9. In titration end point can be determined by change in colour by the addition of
- Solution
 - Acid
 - Base
 - Indicator
10. An exactly required concentration can be prepared from chemical substance is called as
- Primary standard
 - Secondary standard
 - Both A and B
 - None of this

SECTION – B

Answer any FIVE Questions : (5 × 2 = 10)

- What do you mean by Atomic number and Mass number?
- Define bond energy.
- What is the hybridization and geometry of SF_6 ?
- Write the difference between nuclear reaction and chemical reaction.
- Define law of radioactivity.
- What do you mean by an indicator? Write one example.
- How do you prepare 1 N NaOH in 500 mL?

SECTION – C

Answer ALL Questions : (5 × 5 = 25)

- Explain the Bohr's hydrogen spectrum.
(OR)
b) Derive de-Broglie equation.
- Discuss the formation of N_2 molecule on the basis of VB theory.
(OR)
b) Illustrate the various types of overlapping with examples.
- Draw the MO diagram of O_2 molecule and calculate its bond order.
(OR)
b) Illustrate the Born-Haber cycle for NaCl.
- What is group displacement law? Explain with example.
(OR)
b) Write the difference between nuclear fission and nuclear fusion.
- Write a note on
 - Molecular weight
 - Formula weight
 - Equivalent weight
 (OR)
b) What are secondary standards?
Write their requirements with examples.

SECTION – D

Answer any THREE Questions : (3 × 10 = 30)

- State and explain the following
 - Aufbau principle
 - Hund's rule
 - Pauli exclusion principle
 - Zeeman effect
 - Heisenberg's uncertainty principle

24. a) Explain the following with suitable examples

i) sp hybridization ii) sp^2 hybridization iii) sp^3 hybridization

b) Write a note on the formation of He_2 molecule on the basis of VB theory.

25. a) What do you mean by hydrogen bonding?

Discuss its types with examples. (6)

b) Write a note on Fajan's rule. (4)

26. Discuss in detail about the applications of radioactivity.

27. a) How do you prepare a standard solution? Explain. (5)

b) Discuss the different types of titrations. (5)





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B.Sc. Chemistry Degree (Semester) Examinations, November 2018

Part – III : Core Subject : First Semester : Paper – I

GENERAL CHEMISTRY – I

Under CBCS – Credit 4

Time: **3** Hours

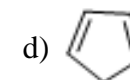
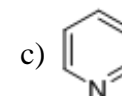
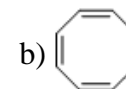
Max. Marks: **75**

SECTION – A

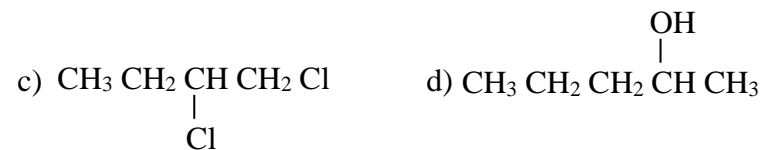
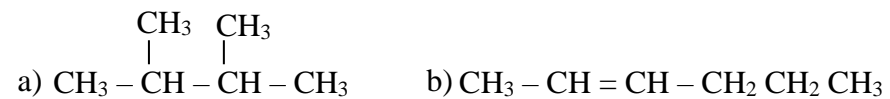
Answer ALL Questions :

(10 × 1 = 10)

- The series of lines present in the visible region of Hydrogen spectrum is:
a) Lyman b) Balmer c) Paschenn d) Brackett
- How is energy and wavelength related to each other?
a) $E = hc/\lambda$ b) $E = h\lambda/c$ c) $E = c\lambda/h$ d) $E = hc\lambda$
- The order of screening effect of orbital is:
a) $s > p > d > f$ b) $f > d > p > s$ c) $p > d > s > f$ d) $d > f > s > p$
- The predominant factor to determine the nature of bonds is:
a) charge b) electronegativity c) size d) mass
- Homolytic fission produces _____.
a) Free radical b) Nucleophile c) Electrophile d) both a and b
- Which one of the following is an example for elimination reaction?
a) Chlorination of methane b) Dehydration of ethanol
c) Nitration of benzene d) Hydroxylation of ethylene
- Alkene shows geometric isomerism due to
a) asymmetry b) Rotation around single bond
c) Resonance d) Restricted rotation around double bond
- Which of the following is an aromatic compound



25. i) Write the IUPAC name of following : (4)



ii) Explain the Huckel's rule for aromatic and non aromatic compounds with suitable examples. (6)

26. i) How will you distinguish between inductive effect and mesomeric effect. (5)

ii) Write note on following i) Substitution Reaction
ii) Elimination Reaction (5)

27. Discuss about the Intermediate compound formation theory.





VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

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[Affiliated to Madurai Kamaraj University]

B.Sc. Chemistry Degree (Semester) Examinations, November 2018

Part – III : Core Subject : First Semester : Paper – II

GENERAL CHEMISTRY – II

Under CBCS – Credit 4

Time: **3** Hours

Max. Marks: **75**

SECTION – A

Answer ALL Questions :

(10 × 1 = 10)

- A base is _____ acceptor according to Bronsted-Lowry.
a) Proton donor b) Proton acceptor
c) Electron donor d) Electron acceptor
- Benzene is an example for _____ solvent.
a) Polar b) Amphoteric c) Protic d) Non-polar
- Which one of the following isotope is radioactive?
a) Protium b) Tritium c) Deuterium d) None of the above
- All the alkali metals are good reducing agents due to their _____.
a) high ionization energy b) low hydration enthalpy
c) low ionisation energies d) high hydration enthalpy
- Methane on controlled oxidation with $O_2/Cu/523\text{ K}$ gives _____.
a) $HCHO$ b) CH_3CHO c) CH_3OH d) $HCOOH$
- Which reactions are most common in alkenes?
a) Electrophilic substitution reactions
b) Nucleophilic substitution reactions
c) Electrophilic addition reactions
d) Nucleophilic addition reactions
- A system in which no thermal energy passes into or out of the system is called _____.
a) adiabatic system b) an open system
c) a reversible system d) a closed system

8. Heat capacity at constant volume is the change in
- internal energy with temperature at constant volume
 - internal energy with temperature at constant pressure
 - enthalpy with temperature at constant volume
 - enthalpy with temperature at constant pressure
9. The scattering of light by the dispersed phase is called
- Brownian movement
 - Tyndall effect
 - Adsorption
 - Electrophoresis
10. The human kidneys purify the blood by _____ through natural membranes
- Osmosis
 - Diffusion
 - Dialysis
 - Emulsification

SECTION – B

Answer any FIVE Questions :

(5 × 2 = 10)

- What are conjugate acid-base pairs?
- State Usanovich concept.
- Write the uses of heavy water.
- State Markounikov's rule.
- Define systems.
- What are gold Numbers?
- What is Brownian movement?

SECTION – C

Answer ALL Questions :

(5 × 5 = 25)

- 18.a) Discuss about the classification of Lewis Acids and Bases.

(OR)

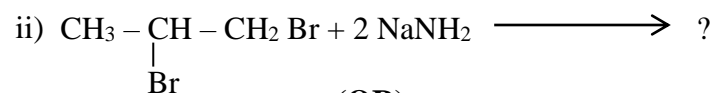
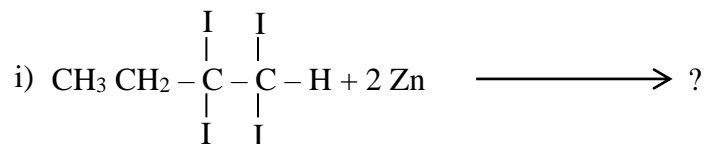
- b) Write the advantages and disadvantages of liquid Ammonia as solvent.

- 19.a) Describe the reducing properties of alkaline earth metals.

(OR)

- b) Explain the classification of hydride with suitable examples.

- 20.a) Complete the following reactions with explanation.



(OR)

- b) Write the Sabatier-Senderens reactions.

- 21.a) How will you prove $C_p - C_v = R$ for one mole of an ideal gas.

(OR)

- b) State the First Law of thermodynamics with mathematical statement.

- 22.a) Describe the electrical properties of colloids

(OR)

- b) Explain the preparation and types of emulsions.

SECTION – D

Answer any THREE Questions :

(3 × 10 = 30)

23. Explain the chemical reaction that can occur in liquid sulphur dioxide.

24. i) Discuss about the diagonal properties of Li and Mg. **(5)**

- ii) Write the preparation and properties of Ortho and Para hydrogen. **(5)**

25. i) Write note on following a) Hofmann degradation reaction

- b) Kharasch peroxide effect **(5)**

- ii) Explain the chlorination reaction with mechanism. **(5)**

26. i) Derive the relationship $\Delta H = \Delta E + \Delta nRT$. **(5)**

- ii) Write a short note on Kirchhoff's equation. **(5)**

27. Explain the application of colloids in various fields.





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B.Sc. Chemistry Degree (Semester) Examinations, November 2018

Part – III : Core Subject : Third Semester : Paper – I

INORGANIC AND ORGANIC CHEMISTRY – II

Under CBCS – Credit 4

Time: **3** Hours

Max. Marks: **75**

SECTION – A

Answer ALL Questions : (10 × 1 = 10)

- The equivalent weight of KMnO_4 in acidic medium is _____.
a) 31.6 b) 158 c) 52.67 d) 49
- In the titration of iodine against hypo the indicator used is _____.
a) KI b) $\text{K}_2\text{Cr}_2\text{O}_7$ c) $\text{K}_3\text{Fe}(\text{CN})_6$ d) Starch
- Cassiterite is an ore of _____.
a) Mn b) Ni c) Sb d) Sn
- Extraction of aluminium from bauxite ore, reduction is carried out by
a) Carbon b) Magnesium c) Electrolysis d) Hydrogen
- Phenol reacts with acetoacetic ester to give coumarins. This reaction is known as _____.
a) Friedel-Craft reaction b) Pechmann condensation
c) Dakin reaction d) Gattermann reaction
- Naphthalene undergoes oxidation with $\text{Na}_2\text{Cr}_2\text{O}_7 / \text{H}_2\text{SO}_4$ to form
a) Phthalic acid b) Benzoic acid c) Tetralin d) Phenylacetic acid
- Which of the following is not an organosulphur compound _____.
a) thioalcohols b) thioethers c) tertiary amines d) All of these
- Ethyl phenyl ether is formed when phenol is treated with _____.
a) $\text{CH}_3\text{CH}_2\text{Cl} / \text{NaOH}$ b) $\text{CH}_3\text{Cl} / \text{NaOH}$
c) Ethers d) Acetic anhydride
- Methyl ketones can be distinguished from ordinary ketones by _____.
a) Tollen's test b) Fehling test c) Benedict test d) Iodoform test
- Oxidation of cinnamaldehyde with acidified potassium permanganate gives _____.
a) Cinnamic acid b) Cinnamyl alcohol
c) Benzoic acid d) Benzaldehyde

SECTION – B

Answer any FIVE Questions :

(5 × 2 = 10)

11. Define molarity and normality.
12. What is the concentration of sugar ($C_{12}H_{22}O_{11}$) in mol L^{-1} , if 20 g of it is dissolved in enough water to make a final volume up to 2 L?
13. What is the difference between mineral and an ore?
14. How is picric acid prepared from phenol?
15. Draw the structure of catechol and resorcinol.
16. Name the poisonous gas used in World War-I and write its formula.
17. Why ketones are less reactive than aldehydes for nucleophilic addition?

SECTION – C

Answer ALL Questions :

(5 × 5 = 25)

18. a) What is a primary standard? List the requirements of a primary standard. How will you prepare a Standard solution?
(OR)
b) Explain the principle involved in the estimation of Iron by potassium dichromate method. Write the suitable equation involved.
19. a) Describe Van-Arkel process and Zone refining process in detail.
(OR)
b) Outline the electromagnetic separation method in ore dressing. Which metals are extracted by thermoelectrolytic reduction method?
20. a) Mention any two tests for identification of phenols.
(OR)
b) i) While separating a mixture of *ortho* and *para* nitro phenols by steam distillation, name the isomer which will be steam volatile. Give reason. (2)
ii) How phenolphthalein is obtained from phenol? (3)
21. a) How each of the following can be synthesized by Williamson's synthesis? i) Anisole ii) Phenetole

(OR)

- b) What are thio alcohols?
How do they resemble and differ from alcohols.
22. a) Give the chemical tests for distinguishing aldehydes and ketones with suitable reactions.

(OR)

- b) Give the detailed mechanism for Aldol condensation.

SECTION – D

Answer any THREE Questions :

(3 × 10 = 30)

23. a) Find out the normality and molality of a solution containing 10 g of NaOH per 250 ml of solution, density of solution is 1.1 g/mL. (5)
b) Explain the Principle involved in complexometric titration.
Draw the structure of EDTA. (5)
24. a) Draw the general flow chart diagram for metal extraction. (6)
b) Compare the properties of group III elements in detail with suitable examples. (4)
25. a) Account, Why phenols are less acidic than alcohols? (4)
b) How can you get the following from naphthalene (6)
i) α – Naphthylamine ii) β – Naphthol iii) Phthalic acid
26. a) Write notes on the following. (6)
i) Wittig reaction ii) Mercaptans
b) Mention the properties of thio ethers (4)
27. a) How will you convert the following? (8)
i) Benzene to benzophenone ii) Phenol to salicylaldehyde
iii) Acetone to Diacetone alcohol iv) Glycerol to acrolein
b) Draw the structures of the following (2)
i) Quinone ii) Glycolaldehyde
iii) Verataldehyde and iv) Crotonaldehyde



Under CBCS – Credit 4

Time: **3** HoursMax. Marks: **75**

Answer ALL Questions :

(10 × 1 = 10)

- The unit of 'a' the Van der Waal's constant are
 - atm Lit Mol⁻¹
 - atm Lit⁻¹ Mol⁻¹
 - atm Lit⁻² Mol⁻²
 - atm Lit⁻¹ Mol⁻²
- What does the constant bombardment of gas molecules against the inside walls of a Container produce?
 - Temperature
 - Density
 - pressure
 - Diffusion
- Which of the following properties is not a state function
 - concentration
 - internal energy
 - enthalpy
 - entropy
- Hess's law is used to determine _____.
 - heat of formation of substances which are otherwise difficult to measure
 - heat of transition
 - heats of various other reactions like dimerization
 - all of the above
- The entropy of the system increases in the order _____.
 - gas < liquid < solid
 - solid < liquid < gas
 - gas < solid < liquid
 - none of these
- The efficiency of heat engine is maximum when _____.
 - temperatures of source and sink are maximum
 - temperatures of source and sink are minimum
 - temperature of source is minimum and that of sink is maximum
 - temperature of source is maximum and that of sink is minimum
- The relation between probability and entropy is given by
 - $S = \ln w$
 - $S = \ln w^2$
 - $w = \ln S$
 - $S = k \ln w$

8. If ΔS^\ddagger is positive for a reaction, then the reaction will be
 - a) normal
 - b) slow
 - c) fast
 - d) unpredictable
9. Equilibrium reactions are characterized by _____.
 - a) going to completion
 - b) being non – spontaneous
 - c) the presence of both reactants and products in a definite proportion
 - d) a and b
10. A catalyst will increase the rate of chemical reaction by
 - a) shifting the equilibrium to the right
 - b) lowering the activation energy
 - c) shifting the equilibrium to the left
 - d) increasing the activation energy

SECTION – B

Answer any FIVE Questions :

(5 × 2 = 10)

11. Define collision diameter.
12. State Boyle's law.
13. State first law of thermodynamics.
14. What is mean by Joule Thomson effect?
15. State Clasius inequality.
16. State Nernst heat theorem.
17. State Law of mass action.

SECTION – C

Answer ALL Questions :

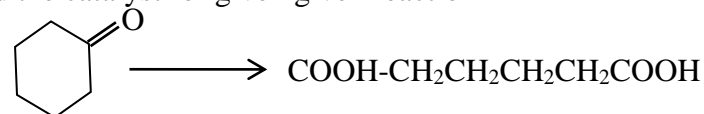
- 18.a) Write any five postulates of kinetic theory of gases.

**ORGANIC CHEMISTRY – II**

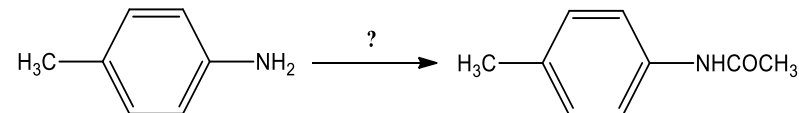
Under CBCS – Credit 4

Time: **3** HoursMax. Marks: **75****SECTION – A****Answer ALL Questions :****(10 × 1 = 10)**

1. Find the catalyst for given reaction



- a) $\text{HNO}_3/(\text{O})$ b) H_2O c) KMnO_4 d) O_2
2. Maleic acid and fumaric acid _____.
- a) have identical melting point b) form same ester with methanol
- c) form succinic acid d) form anhydride on heating
3. On hydrolysis of methyl cyanide gives _____.
- a) Acetic acid b) formic acid c) formaldehyde d) malic acid
4. Amines are generally classified as _____.
- a) Weak acids b) strong acids c) Weak bases d) Strong bases
5. Nitrobenzene undergoes reduction with Zn/KOH to give _____.
- a) Aniline b) Azobenzene c) Hydrazobenzene d) Toluene
6. Predict the suitable reagent for the following conversion



- a) KMnO_4 b) CH_3COCl c) NH_3 d) CH_3COOH
7. The most stable conformation of ethane is _____.
- a) Eclipsed b) Staggered c) Skew d) Gauche

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

23. a) Explain geometrical isomerism exhibited by malonic acid and fumaric acid. **(6)**
- b) Write the preparation of the following compounds **(2 + 2)**
- i) phthalic anhydride ii) phthalimide
24. What happens when diazomethane reacts with i) phenol
- ii) Na/Hg iii) ethylene iv) acetylene v) methylamine
25. What happens when urea reacts with i) action of heat ii) SOCl_2
- iii) HCHO iv) H_2O v) NH_2NH_2
26. What is racemic mixture? Describe the various methods of resolving a racemic mixture.
27. Explain Bayer's strain theory and its limitation.





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B.Sc. Chemistry Degree (Semester) Examinations, November 2018

Part – III : Core Subject : Fifth Semester : Paper – II

INORGANIC CHEMISTRY – II

Under CBCS – Credit 5

Time: **3** Hours

Max. Marks: **75**

SECTION – A

Answer ALL Questions :

(10 × 1 = 10)

- The coordination number of a central metal atom in a complex is _____.
 a) The number of ligands around a metal ion bonded by sigma and pi-bonds both
 b) The number around a metal ion bonded by pi-bonds
 c) The number of ligands around a metal ion bonded by sigma bonds
 d) The number of only anionic ligands bonded to the metal ion
- IUPAC name of $[\text{Pt}(\text{NH}_3)_2\text{Cl}(\text{NO}_2)]$ is
 a) platinumdiamminechloronitrite
 b) chloronitrito-N-ammineplatinum(II)
 c) diamminechloridonitrito-N-platinum(II)
 d) diamminechloronitrito-N-platinate(II)
- According to CFT, the bond between metal cation and ligand is _____.
 a) covalent
 b) ionic
 c) coordinate covalent
 d) hydrogen bonding
- Which complex of Co^{2+} will have the weakest crystal field splitting?
 a) $[\text{Co}(\text{CN})_6]^{4-}$ b) $[\text{CoCl}_6]^{4-}$ c) $[\text{Co}(\text{en})_3]^{2+}$ d) $[\text{Co}(\text{H}_2\text{O})_6]^{2+}$
- Three of the following ions are kinetically inert, one is labile. Which ion is labile?
 a) Rh^{3+} b) Ti^{3+} c) Ru^{2+} d) Cr^{3+}
- In the spectrochemical series, which ligand produces strong field?
 a) CO b) H_2O c) Cl^- d) NO_2^-

7. What is meant by the term 'accuracy'?
 - a) The lack of bias in the data
 - b) The extent to which a value approaches its true value
 - c) The level of detail at which data is stored
 - d) The overall quality of the data
8. If a student arrives exact value in an experiment, his value is said to be
 - a) Accurate b) Precise c) Correct d) All the above
9. Find out the bulk metals in human body
 - a) Na, K, Mg & Ca b) F, I, Mg & Ca
 - c) Na, K, Co & Ni d) Fe, Co, Ni & Ca
10. Silver sulfadiazine is used to treat and prevent
 - a) Bacterial Infection b) Viral Infection
 - c) Cancer d) Jaundice

SECTION – B

Answer any FIVE Questions :

(5 × 2 = 10)

11. Define ligand.
12. State EAN rule.
13. What is spectrochemical series?
14. What do you mean by labile complexes?
15. Define absolute error.
16. What is co-precipitation?
17. What are essential elements?

SECTION – C

Answer ALL Questions :

(5 × 5 = 25)

- 18.a) Explain bonding in the following complexes using VB theory.



(OR)

- b) Explain the postulates of Werner's co-ordination theory.

- 19.a) Write a brief note on high spin and low spin complexes with an example.

(OR)

- b) Discuss about Jahn – Teller distortion.

- 20.a) Discuss on associative mechanism of nuclear substitution reactions in square planar complexes.

(OR)

- b) Explain inner sphere mechanism of electron transfer reactions.

- 21.a) Write a note on toxicity of the following elements in biological system. i) Hg ii) Pb iii) As

(OR)

- b) Describe about the application of metals in diagnosis and chemotherapy.

- 22.a) Explain the differences between accuracy and precision of a set of analytical data.

(OR)

- b) How is standard deviation calculated for a set of analytical data.

SECTION – D

Answer any THREE Questions :

(3 × 10 = 30)

23. Describe in detail about the following types of isomerism.
 - i) Ionization isomerism ii) Co-ordination isomerism
 - iii) Geometrical isomerism iv) Ionization isomerism
24. Explain in detail about the crystal field theory.
25. What is 'trans' effect? Explain the theories of 'trans' effect?
26. i) What is meant by post – precipitation? What are the differences between post – precipitation and co-precipitation
- ii) Explain the curve fitting by method of least squares.
27. Explain the structure and function of haemoglobin & myoglobin.





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B.Sc. Chemistry Degree (Semester) Examinations, November 2018

Part – III : Core Subject : Fifth Semester : Paper – III

PHYSICAL CHEMISTRY – III

Under CBCS – Credit 5

Time: **3** Hours

Max. Marks: **75**

SECTION – A

Answer ALL Questions :

(10 × 1 = 10)

- Which of the following compound will not conduct electricity in its aqueous solution?
 a) carbontetrachloride b) silver chloride
 c) sodium acetate d) sulphuric acid
- The resistance of a 0.1 N aceticacid solution is 250 ohm when measured in a cell of cell constant 1.15 cm^{-1} . The equivalent conductance of 0.1 N aceticacid solution in $91 \text{ ohm}^{-1} \text{ cm}^2 \text{ eq}^{-1}$
 a) 2.3 b) 4.6 c) 9.2 d) 46
- Chemical used in salt bridge is _____.
 a) KOH b) KCl c) KBr d) NaCl
- The potential of a hydrogen electrode at pH = 10 is _____.
 a) 0.59 V b) 0.00 V c) -0.59 V d) -0.059 V
- In electrolytic cell _____.
 a) chemical energy is converted into heat
 b) electrical energy converted into heat
 c) chemical energy is converted into electrical energy
 d) electrical energy converted into chemical energy
- The energy of a secondary cell is usually renewed _____.
 a) by passing a current through it b) it cannot be renewed at all
 c) by renewing its chemicals d) by heating it

7. The energy of an einstein of radiation of wavelength 400 nm is _____ than that of radiation of 300nm.
 a) lesser b) greater c) equal to d) none of these
8. The energy per einstein depends upon the wavelength of photon. The higher the wavelength, the _____ will be the energy per einstein.
 a) higher b) smaller c) zero d) infinity
9. At a triple point _____.
 a) Both the temperature and pressure are fixed
 b) Only the temperature is fixed
 c) Only the pressure is fixed
 d) Sometimes pressure and sometimes temperature is fixed
10. The reduced rule is _____.
 a) $F = C - P + 2$ b) $F + P = C + 1$
 c) $(F - 1) = (P - C)$ d) $(F - 2) = (P - C)$

SECTION – B

Answer any FIVE Questions : (5 × 2 = 10)

11. What is specific conductance? Give its unit.
 12. Give the relation between free energy change and electrode potential of an electrochemical cell.
 13. Point out the difference between primary and secondary cells.
 14. State Stark-Einstein law of photochemical equivalence.
 15. Calculate the degree of freedom (F) for H₂O at 100°C.
 16. Define transport number. Give the relation between t_+ and t_- .
 17. What is critical solution temperature?

SECTION – C

Answer ALL Questions : (5 × 5 = 25)

18. a) Discuss briefly about Debye – Huckel theory of strong electrolytes.
 (OR)
 b) How is transport number determined by moving boundary method?

19. a) What is single and standard electrode potential? Derive Nernst equation.
 (OR)
 b) With a diagram, explain the construction of metal– metal insoluble salt electrode.
20. a) Explain the determination of pH by quinhydrone electrode.
 (OR)
 b) Elucidate the principle of potentiometric redox titrations.
21. a) State Lambert –Beer's law. Give its mathematical derivation.
 (OR)
 b) Using steady state principle, derive the kinetics of photochemical formation of HBr.
22. a) Write the thermodynamic derivation of Gibbs phase rule.
 (OR)
 b) Construct the phase diagram for Pb–Ag system.

SECTION – D

Answer any THREE Questions : (3 × 10 = 30)

23. i) How is solubility of sparingly soluble salt determined by conductance measurements? (5 + 5)
 ii) Explain the conductometric titration curve between strong acid vs strong base.
24. Deduce the relation between ΔG , ΔH , ΔS , K with EMF.
25. i) Discuss about the electrochemical principle of charging and discharging of Pb acid battery. (6 + 4)
 ii) Give the principle of electrochemical corrosion.
26. i) Describe various photochemical transitions associated with Jablonkski diagram. (8 + 2)
 ii) What is meant by photosensitisation? Give one example.
27. Explain various phases and degrees of freedom for H₂O system with respect to pressure and temperature.



Answer ALL Questions :

(10 × 1 = 10)

- Memory with highest storage capacity is _____.
 - Core memory
 - Semiconductor memory
 - Magnetic tape
 - Magnetic disc
- In Modern Computer CPU contains _____.
 - Memory
 - Arithmetic and logic unit
 - Control unit
 - All the above
- _____ Number System has a base of 8.
 - Binary
 - Decimal
 - Octal
 - Hexadecimal
- Nibble is group of _____ bytes.
 - 2
 - 4
 - 6
 - 8
- Which of the following is program group?
 - Accessories
 - Paint
 - Word
 - all the above
- What is the default font used to type chemical symbols more easily in MS Word 2007 document?
 - Lucida Unicode
 - Lucida Sans
 - Lucida Calibri
 - Lucida Multicode
- Green chemistry is also known as _____.
 - Smart Chemistry
 - Sustainable Chemistry
 - Neat Chemistry
 - All the above
- Sustainable development was announced in which commission _____.
 - United Nations Commission on Environment and Development
 - United Nations Commission on Waste Reduce Act
 - United Nations Commission on Renewable Waste Commission
 - United Nations Commission on Eco Friendly and Development

9. The book Green Chemistry: Theory and Practice was written by
a) Paul T. Anastas and John C. Warner
b) Paul T. Anastas and Franklin
c) Hedge and John C. Warner
d) Paul T. Anastas and Hedge
10. Which of the following is **NOT** one of the twelve principles of green chemistry?
a) Using renewable feedstocks
b) Designing safer chemicals and products
c) Avoiding use of catalysts
d) Maximizing atom economy

SECTION – B

Answer any FIVE Questions :

(5 × 2 = 10)

11. Mention the types of computer.
12. Who is considered to be the father of modern computer?
13. Define the term Algorithm.
14. What is meant by a programming language?
15. Give the significance of CHEMDRAW.
16. Define green chemistry.
17. What is Atom economy?

SECTION – C

Answer ALL Questions :

(5 × 5 = 25)

18. a) What are Input devices and Output devices ? Give examples for each.
(OR)
b) Draw the block diagram of computer and write the functions of all the parts.
19. a) Expand and explain the following abbreviations ASCII, RAM, ROM.
(OR)
b) Write the steps to insert table into the MS-Word.

20. a) Write short notes on the following options.
i) Super Script ii) Sub Script iii) Word Count iv) Drop Caps
(OR)
b) How will you guide your juniors to draw a structure in Chemdraw?
21. a) Mention the importance of promoting green chemistry education.
(OR)
b) Mention some of the environmental protection laws for eco-friendly environment.
22. a) What is the scope of green chemistry?
(OR)
b) Write note on inception of green chemistry.

SECTION – D

Answer any THREE Questions :

(3 × 10 = 30)

23. a) Mention the characteristics of computers. (5)
b) Explain the central processing unit (CPU) with block diagram. (5)
24. a) Write short note about memory. (5)
b) Explain the terms: - computer hardware and software. (5)
25. a) Explain the procedures with suitable examples for the inter conversions of the given number systems
i) Binary to decimal and ii) Decimal to binary (6)
b) Find the decimal equivalent for the binary 0100000 and 1110 (2)
c) Find the binary equivalent for the decimals 25 and 35. (2)
26. What is sustainable development? What is the role of chemist towards sustainable development?
27. Mention any ten principles of green chemistry.





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B.A. / B.Sc. Degree (Semester) Examinations, November 2018

Part – IV : Non-Major Subject : First Semester : Paper – I

FOOD CHEMISTRY

Under CBCS – Credit 2

Time: **2 Hours**

Max. Marks: **75**

SECTION – A

Answer ALL Questions :

(10 × 1 = 10)

1. Which is the good source of Protein?
a) Green vegetables b) Rice c) Fruits d) Eggs
2. Lack of Vitamin A leads to which disease?
a) Rickets b) Anaemia c) Night blindness d) Heart disease
3. Carbohydrates provide _____ to our body.
a) Energy b) Food c) Strength d) Weak
4. Food cooked from energy in the form of electrical waves.
a) Microwave time b) Broiling c) Microwaving d) Roasting
5. The king of spices':
a) Cardomom b) Pepper c) All Spice d) Turmeric
6. Which is least likely to cause food poisoning?
a) Raw sprouts b) Chicken c) Salad d) Mayonnaise
7. A person suffers from goiter because of lack of which mineral?
a) Calcium b) Iron c) Phosphorous d) Vitamin D
8. The principle of adding salt to meat to preserve it is called _____.
a) Pickling b) Curing
c) Both of the mentioned d) Neither of the mentioned

9. Pesticide used to store grains in stores is

- a) Malathione b) Parathion
- c) Sodium sulphite d) Aluminium phosphide

10. Which of the following is a must in food labeling?

- a) Name b) Standard Specification
- c) Place of Origin d) All of the mentioned

SECTION – B

Answer any FIVE Questions :

(5 × 2 = 10)

- 11. Why do we cook food?
- 12. List the nutrients provided by milk.
- 13. Define adulteration.
- 14. Name any five green leafy vegetables.
- 15. Why spices are important in our diet?
- 16. What are the benefits of organic food?
- 17. How are fruit juices preserved?

SECTION – C

Answer ALL Questions :

(3 × 9 = 27)

18. a) Classify different methods of cooking.

(OR)

b) Explain the role of spices in cookery.

19. a) Compare the advantages of pressure cooking and microwave cooking.

(OR)

b) Outline the different methods of food preservation.

20. a) Illustrate the potential uses of food irradiation.

(OR)

b) What is FPO? Explain its functions.

SECTION – D

Answer any TWO Questions :

(2 × 14 = 28)

- 21. Describe the ICMR classification of food groups.
- 22. Discuss the advantages of using onion and garlic in our diet.
- 23. List at least 8 articles normally adulterated, name the adulterant and tests for detection of adulterant.
- 24. Elaborate the functions of vitamins and minerals in the biological systems.





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B.Sc. Chemistry Degree (Semester) Examinations, November 2018

Part – IV : Skill Based Subject : Third Semester : Paper – I

BIOMOLECULES AND PHARMACEUTICAL CHEMISTRY

Under CBCS – Credit 2

Time: **2 Hours**

Max. Marks: **75**

SECTION – A

Answer ALL Questions :

(10 × 1 = 10)

1. DNA is present in
 - a) nucleus only
 - b) nucleus, mitochondria and ER
 - c) nucleus, mitochondria and chloroplast
 - d) nucleus, mitochondria and RER
2. The two strands in a DNA double is joined by
 - a) Co-valent bond
 - b) Hydrogen bond
 - c) ionic bond
 - d) phosphodiester bond
3. Which of the following statements about enzymes or their function is true?
 - a) Enzymes do not alter the overall change in free energy for a reaction
 - b) Enzymes are proteins whose three-dimensional form is key to their function
 - c) Enzymes speed up reactions by lowering activation energy
 - d) All of the above
4. Which of the following statement is/are correct about Enzyme:
 - (i) An Enzyme is a protein.
 - (ii) An Enzyme is used as a catalyst to accelerate the reaction.
 - (iii) Enzymes participate in cellular metabolic processes.
 - (iv) Life would not exist without the presence of enzymes.
 - a) Both (i) and (ii) are correct
 - b) Both (i) and (iii) are correct
 - c) (i), (ii) and (iii) are correct
 - d) All the above are correct
5. An ideal anesthetic drug would
 - a) Induced anaesthesia smoothly and rapidly and secure rapid recovery
 - b) Possess a wide margin of safety
 - c) both (a) and (b)
 - d) all of the above

6. The anesthetic, which is used intravenously is
a) Propofol b) Halothane c) Desflurane d) Nitrous oxide
7. Antibiotic drug invented by Alexander Fleming
a) cephalosporin b) penicillin
c) aminoglycosides d) none of the above
8. Example of analgesics include
a) caffeine b) cocaine c) novocain d) aspirin
9. Removal and killing of all microorganisms is known as
a) Destruction b) Sterilization c) Pasteurization d) Removal
10. For purification of swimming pools and water supplies of chemical used is
a) Alcohol b) Chlorine c) Iodine d) Heavy metals

SECTION – B

Answer any FIVE Questions :

(5 × 2 = 10)

11. Write any two differences in DNA and RNA.
12. What is meant by enzymes catalysis?
13. What is active site?
14. What are anaesthetics? Give two examples.
15. How to prepare paracetamol?
16. Define antipyretic.
17. What are antiseptic? Give two examples.

SECTION – C

Answer ALL Questions :

(3 × 9 = 27)

18. a) Write a note on preparation and properties of amino acids.

(OR)

- b) Explain classification of enzymes.

19. a) What do you mean by anaesthetics?

Write the characteristics of ideal anaesthetics.

(OR)

- b) What are gaseous (volatile) anaesthetics?

Discuss advantage and disadvantage of gaseous anaesthetics.

20. a) Differentiate Narcotic and Non-narcotic analgesic?

(OR)

- b) Briefly explain phenol, Dyes and Nitro furan derivatives as antiseptic and disinfectant.

SECTION – D

Answer any TWO Questions :

(2 × 14 = 28)

21. Write characteristics of antiseptics? Discuss structure and function of any four important antiseptic agents.
22. What are anaesthetics? Discuss general and local anaesthetics.
23. What are narcotic analgesics? Write down the structure and function of any one natural and synthetic analgesics.
24. Discuss following terms:
i) Nucleosides ii) Nucleotides iii) Nucleic acid

