**Rayat Shikshan Sanstha's**
**Yashawantrao Chavan Institute of Science, Satara (Autonomous)**
**Department of Chemistry ( Drug Chemistry)**
**B.Sc. I, Semester II: End Semester Examination June- 2022**
**Paper Title- Introducton To Pharmaceutical Chemistry I Paper Code : BDCT 201**

**Question bank**

## Q. 1 Answer in one sentence [2Marks]

1. Define buffer capacity
2. What is the role of iron in the human body?
3. Mention the names of Tridosha
4. Write names of pharmaceutically active constituent in turmeric and cumin
5. Write the chemical name and molecular formula of caustic soda
6. Write the chemical name and molecular formula of washing soda
7. write pharmaceutically active ingredient of liquorice and cardamom
8. Mention the names of Triguna
9. What is the use of iodine in human body?
10. Complete the following reactions
    a. $Mg + HCl \longrightarrow ? + ?$
    b. $KOH + HCl \longrightarrow ? + ?$
11. What is buffer capacity
12. Write names of pharmaceutically active ingredient of Cinnamon and Clove
13. Write chemical name and molecular formula of baking soda
14. Write names of Tridosha and Triguna
15. Complete the following reaction
    a) $Ca + 2\,HCl \longrightarrow ? + ?$
    b) $KOH + HCl \longrightarrow ? + ?$
16. Define Buffer with suitable example

17. Complete the following reaction

a) $Mg + 2\,HBr \longrightarrow ? + ?$

b) $KOH + HBr \longrightarrow ? + ?$

18. Write names of pharmaceutically active ingredient of Cinnamon and Ashwagandha

19. Write use of calcium gluconate

20. Write names of pharmaceutically active ingredient of Bitter melon and Brahmi

21. Write use of ferrous sulphate

22. What is Acidic buffer

23. What is Basic buffer

24. Explain Buffer capacity

25. Eugenol and Withanone are isolated from which medicinal plant

**Q.2) Attempt any two from the following questions [10 Mark]**

1. Derive buffer equations for acidic and basic buffer
2. Explain in detail Ashwagandha and Bramhi as ayurvedic medicine
3. Write properties and applications of Iron and Calcium
4. Explain in details Turmeric and Ashwagandha as Ayurvedic medicine
5. Write properties and applications of Calcium gluconate
6. What is acidic and basic buffer derive eqations for the same
7. Explain tridosha in details
8. Explain in details Brahmi and Bitter melon as Ayurvedic medicine

9. Explain acidic and basic buffer with equations for both acidic and basic buffer
10. Explain properties and applications of ferrous sulphate
11. What is the fever of ayurveda ? Explain Ashtang Ayurveda
12. Explain the mutual relationship between Panchamahabhuta – Triguna-Tridosha
13. Write any two methods of Preparation of HCl along with physical & Chemical properties of HCl
14. Write any two methods of Preparation of Ammonia along with physical & Chemical properties of Ammonia
15. Explain uses of calcium gluconate in detail

**Q. 3) Attempt any four from the following questions [5x4=20]**

1. Write a short note on pH of neutral or pure water with equation
2. Write methods of preparation of HCl from sodium chloride and from the biproducts ($H_2$ & $Cl_2$) of manufacturing of caustic soda
3. Write physical and chemical properties of ammonia
4. Explain Lokpurusha Samya Siddhanta
5. Explain properties of calcium gluconate
6. Explain liquorice as a Ayurvedic medicine
7. Write short note on pH of neutral or pure water with equation
8. Write methods of preparation of hydrochloric acid from sodium chloride and from the biproducts ($H_2$ &$Cl_2$) manufacturing of caustic soda
9. Explain watermelon as Ayurvedic medicine
10. Write uses of boric acid and HCl
11. Explain properties of calcium gluconate

12. Define buffer and write in details buffer action of Acetic Acid ($CH_3COOH$) and Sodium Acetate ($CH_3COONa$) buffer
13. Define buffer and write in details action of basic buffer $NH_4OH$ & $NH_4Cl$
14. Write uses of boric acid and HCl
15. Write methods of preparation of HCl from sodium chloride and from the biproducts ($H_2$ & $Cl_2$) manufacturing of caustic soda
16. Explain Lokpurusha Samya Siddhant
17. Write properties of calcium gluconate
18. Explain carcadian rhythm of tridosha on the basis of seasons
19. Explain turmeric as ayurvedic medicine
20. Explain cardamom as ayurvedic medicine
21. Explain bitter melon as ayurvedic medicine
22. Explain Haber's Process of manufacturing of ammonia
23. Explain Prakriti the unique identity
24. Write methods of preparation of sodium hydroxide
25. Write uses of ammonia and Sodium hydroxide
26. Explain acidic buffer with derivation
27. Explain basic buffer with buffer equation
28. Define buffer and explain buffer action of acidic buffer
29. Define buffer capacity Explain buffer action of $NH_4OH$ & $NH_4Cl$ buffer
30. Explain Samanya Vishesh Siddhanta

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**B.Sc. I, Semester II: End Semester Examination June- 2022**
**Paper Title- Analysis Techniques I Paper Code : BDCT 202**

## Question Bank

**Q. 1 Answer in one sentence [2 Marks]**

1) What is radox reaction? Give suitable example.
2) Define - a) acidic buffer solution b) basic buffer solution.
3) Define the term Precipitation with suitable example.
4) Define Post- Precipitation with example.
5) Define mixed indicator with suitable example
6) Define oxidation and reduction in terms of electron
7) Define colloidal state with suitable example
8) Write various types of washing solutions
9) Define mixed indicator with suitable example
10) Define pH and pOH.
11) What is Post- Precipitation give example.
12) What is colloidal state.
13) What is mixed indicator give example.
14) What is meant by reducing agent? Name the best reducing agent.
15) Define Oxidising agent and reducing agent
16) What is meant by oxidizing agent ? Name the best oxidizing agent
17) Define acids and bases according to Arrhenius theory
18) Give any two examples of oxidizing agent.
19) Give any two examples of Reducing agent.
20) Write a list of reference indicators
21) Write various types of acid base titration.
22) Which indicator is used in acid-base titration?
23) Define Neutralization and indicators
24) Enlist acid base characters
25) Define law of mass action

**Q.2 Attempt any two of the following [10 Marks]**

1) Explain the term - a) Neutralization of strong acid with strong base

b) Neutralization of weak acid with a strong base

1) Explain the redox indicators. Give types of indicators with suitable example.
2) Explain any two terms in brief - a) precipitation b) filtration c) drying and ignition of precipitation
3) Explain acid base concept with the help of arrhenious theory? Explain role of solvent.
4) Explain in brief strength and equivalent weights of oxidizing and reducing agent.
5) Explain any two terms in brief - a) weighing and calculation

b) precipitation c) filtration

6) Describe in brief acid base concept with the help of Bronsted theory. Explain roll of solvent
7) Explain the redox indicators. Give types of indicators with suitable example.
8) Explain any two terms in brief –

a) filtration b) dry and ignition of precipitation c) weighing and calculation

9) Explain acid base concept with the help of Lewise theory? Explain role of solvent
10) Define pH and pOH derieve relationship between pH and pOH, Explain pH indicators
11) Explain the term - a) Neutralization of strong acid with strong base

b) Neutralization of weak base with a strong acid

12) Explain Acid base indicators in detail
13) Explain Ostwald's colour change interval theory
14) Explain solubility product with suitable example
15) Define gravimetric analysis, Explain filtration techniques

**Q.3 Attempt any four of the following [5 Marks]**

1) Define and explain law of mass action.
2) Explain for John's method and it's applications in pharmaceutics.
3) Explain in brief gravimeatric estimation of barium sulfate.
4) Balancing simple redox reaction with suitable example.
5) Define pH and pOH . Derive relation between pH and pOH.
6) Explain neutralization indicator.
7) Explain ionic product of water
8) Explain auto ionization of water

9) How does Iodometry differ from Iodimetry.
10) Explain volhard's method and its application in pharmaceutics.
11) Define pH and pOH. Explain relation between pH and pOH.
12) Write short note on acid base character of non aqueous solvents
13) Write short note on oxidation number or oxidation state.
14) Explain comman ion effect.
15) Explain for Mohr's method and it's applications in pharmaceutics.
16) Explain for Gay Lussac’s method and it's applications in pharmaceutics.
17) Write short note on precipitation
18) Explain in brief gravimetric estimation of barium sulfate.
19) Write a note on Balancing simple redox reaction with suitable example.
20) Explain in brief auto ionization of water.
21) Describe the term neutralization indicato
22) Explain various types of indicators used in redox titration
23) Write short note on iodometry
24) Write short note on iodimetry
25) Explain resonance theory of indicators
26) Explain relative strength of acid and bases
27) Write short note on Hesselbatch equation
28) Write Applications of buffer solutions
29) Explain theory of redox titration
30) Explain Self indicator and External indicator

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**B. Sc. I (Sem II)**

**Question Bank**

**Remedial mathematics (BDCT-203)**

**Q.1: Answer in one sentence** **[ 2 Marks]**

1) Enlist the types of printers. Describe it in Short.

2) Define statistics

3) What is secondary memory?

4) If $y = e^{2x}$ then find $y_5$ (i.e. $5^{th}$ derivation of y)

5) Define polynomial distribution

6) If $y = \log x^2$ then find dy/dx.

7) Define probability distribution.

8) Evaluate $\int x^4 \, dx$

9) Write down the characteristics of main memory.

10) Define computer organization.

11) What is the purpose of memory storage unit?

12) What is control unit?

13) Describe an arithmetic logic unit.

14) What is an emissive display?

15) What is a non-emissive display?

16) Write down the advantages and disadvantages of dot matrix printer.

17) What is a daisy wheel printer?

18) Write down the characteristics of the main memory.

19) Define Random variable

20) Define regression Analysis

21) Find the determinant of the matrix below

$$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

22) Find the determinant of the A =

$$\begin{vmatrix} 2 & 5 \\ 3 & -4 \end{vmatrix}$$

23) Find the A+B =

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} + \begin{bmatrix} 2 & -1 \\ 0 & 1 \end{bmatrix}$$

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24) Define correlation

25) Define No correlation

**Q.2: Attempt the following. [10 Marks]**

a) Define normal distribution and state its properties .

b) solve the given system of equations by Cramer's rule

x + y + z = 6 , y + 3z = 11 , x - 2y + z = 0

c) Explain output devices in brief.

d) solve the given system of equations by Cramer's rule

x + y + z = 6 , y + 3z = 11 , x - 2y + z = 0

c) Write down the structure of a simple program with the suitable example.

e) Solve the following system of 3 equations in 3 variables using Cramer's rule x + y + z = 2, 2x + y + 3z = 9, and x - 3y + z = 10.

f) If $y = e^{ax}$ then find $y_n$ = ? (i.e $n^{th}$ derivative of y)

g) Explain the concept of correlation and discuss it's type.

h) Write down the structure of a simple program with the suitable example.

i) Explain Input devices.

j) What is printer? Explain its types.

k) Explain the types of memory in brief

l) Describe the types of language in brief

m) What is an algorithm? Explain with an example.

n) Explain keyboard, mouse, and scanner in brief.

o) Explain Impact printers.

p) Describe non-impact printers.

q) Explain Discrete random variable and continuous random variable

**Q.3: Attempt the following.** **[5 Marks]**

i. Explain concept of scatter diagram

ii. Explain CPU in brief, with a neat diagram.

iii. Evaluate $\int x^2 e^x \, dx$

iv. If $y = 5^x$ then $y_n = ?$

v. List the input Devices. Explain any two

vi. Define Binomial distribution and state its properties

vii. What is memory? Explain any one.

viii. Explain the term -input Devices

ix. Enlist the types of printer. Describe it in Short.

x. If $y = e^{x4}$ then dy/dx = ?

xi. Explain the concept of regression analysis

xii. What is memory? Explain any one.

xiii. Explain CPU in brief, with neat diagram.

xiv. Explain pointing devices.

xv. What is memory? Explain any one.

xvi. Explain control unit in brief

xvii. Explain digitizer and microphone.

xviii. List the input Devices. Explain any two

xix. Explain MICR and bar code reader?

xx. Describe OMR and OCR.

xxi. Describe CRT monitors in brief.

xxii. Explain flat panel display.

xxiii. Explain character printers.

xxiv. Describe line printers.

xxv. Write a program to add two values, With an algorithm.

xxvi. Define and explain Binomial distribution

xxvii. Write additive property of normal distribution.

xxviii. Explain types of corelation

xxix. Find the inverse of

$$A = \begin{bmatrix} 2 & 1 & 1 \\ 3 & 2 & 1 \\ 2 & 1 & 2 \end{bmatrix} \quad A^{-1} = ?$$

xxx. If $y = x^2 + 1$ then find dy/dx.

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**B.Sc. I, Semester II: End Semester Examination June- 2022**
**Paper Title- Introduction To Biochemistry Paper Code : BDCT 204**

## Question bank

**Q. 1 Answer in one sentence [2 Marks]**

1. Define endocrine glands and hormone
2. Write any two examples of water soluble hormones
3. What are the dietary sources of vitamin C and Vitamin E?
4. Write two examples of each macro and micro nutrients
5. What are the functions of blood?
6. Write names of hormones secreted by
   a) Thyroid gland b) Posterior pituitary gland
7. What are dietary sources of Vitamin A and Vitamin K?
8. Write examples of and minerals
9. Write two examples lipid soluble hormones
10. Write functions of blood?
11. Write sites of secretion of hormone
    A) Triiodothyronine ($T_3$) B) Oxytocin
12. What are the dietary sources of Vitamin C and vitamin A?
13. What is the role blood in body?
14. Which are the dietary sources of iodine and Zinc?
15. Write two examples of steroid hormones
16. Write dietary sources of calcium and Potassium
17. Write sites of secretion of hormone a) Tetraidothyronine b) Antidiuretic hormone
18. Write two examples of eicosanoide hormone
19. Write examples of essential trace elements
20. Write vitamers of vitamin A and vitamin K
21. What are the Dietary source of vitamin D and Vitamin E ?
22. What are the dietary source of mineral Mg and Mn ?
23. Explain O blood group is Universal donor
24. Write examples of Peptide hormone
25. Write the names of deficiency symptoms of a) Calcium b) Iron

**Q. 2 Attempt any two of the following [10 Marks]**

1. Give two examples of water soluble hormone and explain working mechanism of action of water soluble hormone
2. Define coagulation of blood and explain five steps of blood clotting process
3. Write the dietary sources and biochemical functions of calcium and phosphorus
4. Give two examples of lipid soluble hormones and explain the working mechanism of lipid soluble hormones with a suitable diagram.
5. What are the dietary sources and biochemical functions of Manganese and Zinc?
6. Define coagulation of blood Explain mechanism of Blood coagulation in detail
7. Write two examples of water soluble hormone and explain working mechanism of water soluble hormone with suitable diagram
8. Explain the detail process of Blood coagulation
9. Write a brief note on dietary sources and biochemical functions of calcium and manganese
10. Write dietary sources and Explain deficiency symptoms of vitamin D and vitamin E
11. Write dietary sources and biochemical functions of mineral Iron and magnesium
12. Define the terms endocrine glands and hormones, Explain classification of hormones along with two examples of each
13. Explain classification and functions of hormones.
14. Explain RAA Pathway
15. Explain factors promoting and the factors inhibiting absorption of calcium

**Q. 3 Attempt any four of the following [5 Marks]**

1. What are dietary sources of Vitamin D? Write its deficiency symptoms
2. Write short note on classification of hormones
3. Explain blood grouping in details
4. What are dietary sources of Vitamin E? write about deficiency symptoms and toxicity of Vitamin E
5. Write a short note on calcium gluconate.
6. Explain in brief mineral magnesium with reference to biochemical functions dietary requirement sources and absorption in body

7. What are biochemical functions of Manganese?
8. What are dietary sources of Vitamin C? write note on deficiency symptoms of vitamin C
9. Explain ABO system of blood groups
10. Write dietary sources, deficiency symptoms and hypervitaminosis of Vitamin K
11. Write a brief note on classification of hormones.
12. Explain the term hypocalcemia and rickets
13. Define Minerals and write brief classification of minerals
14. Write short note on classification of hormone
15. What are the dietary sources of vitamin A? explain deficiency symptoms of vitamin A
16. What are the dietary sources of sodium? explain biochemical functions of sodium in the human body.
17. Define Minerals and write brief note on classification of minerals.
18. Explain principal elements and write major functions of principal elements
19. Explain vitamin D is hormone not a vitamin
20. What are dietary sources of tocoferols? write about deficiency symptoms and toxicity of tocoferols
21. What are dietary sources of Ascorbic acid ? write note on deficiency symptoms of Ascorbic acid
22. Write the Sources and vitamers of vitamin A, Explain chemistry among the vitamers of Vitamin A
23. What are the dietary sources of retenol? explain deficiency symptoms of retenol
24. What are dietary sources of Calcitriol ? Explain deficiency symptoms
25. Explain positive feedback mechanism of hormonal action
26. Explain negative feedback mechanism of hormonal action
27. Write short note on lymphatic system
28. Explain effects of human growth hormone and insulin like growth factor
29. Explain regulation of secretion of anti diuretic hormone
30. Explain Iron is a one way substance with the help of diagram

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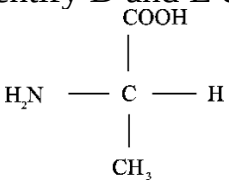
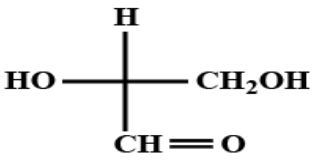
**B. Sc. I (Sem II)**
**Question Bank**

# Organic Chemistry (BDCT-205)

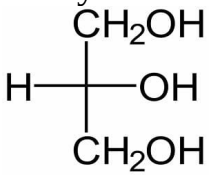
**Q. 1 Answer in one sentence** **[2 Marks]**

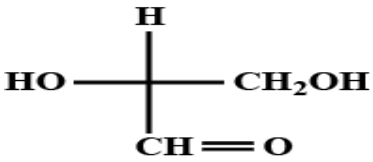
1) Define Heterolytic fission with suitable examples.
2) Define asymmetric center with suitable example
3) Define Huckel's Rule
4) Define a) alkane b) alkenes
5) Identify D and L configuration of following Compound




**6)** Define electrophilic aromatic substitution reaction with suitable examples.
7) Define free radicals with suitable example
8) Define a) alkene b) alkynes
9) Define the term a) Isomerism b) isomers
10) Identify D and L configuration of following Compound



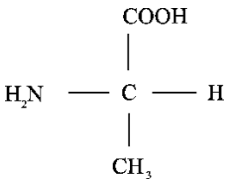

11) Define electromeric effect with example

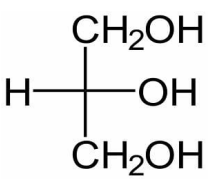
12) Define non-aromatic compounds with example

13) Define a) alkene b) alkynes

14) Give two methods for generation of nitrene.

15) Identify D and L configuration of following Compound




16) Why following compounds are aromatic?

a) Benzene b) Naphthalene c) Pyrrole d) Anthracene e) Furan

17) Write the general formula of a) cycloalkane b) Cycloalkene

18) Explain structure of carbanion with hybridization.

19) Name the organic reactive intermediates containing carbon.

20) What is benzyne ? Give its structure.

21) Define Diastereomers with suitable example.

22) Define Aromatic compound with suitable example.

23) Write the resonance structure of benzene.

24) Write a general formula of cycloalkanes with suitable example.

25) Give the different types of stereoisomerism.

26) Give various systems used to name stereoisomers .

27) Give the chemical reaction when a carbocation is treated with

a) water b) bromide ion

28) What is carbene. How are they generated from ketenes?

**Q.2: Attempt the following. [10 Marks]**

a) What is Carbocation? Explain the term 1)Generation, 2)Reactions.

b) Explain in brief i) Enantiomers, ii) Diastereomers

c) i) What are saturated and Unsaturated hydrocarbons?

ii) Explain the term - a) Aromatic b) Non-Aromatic, c) Antiaromatic d) pseudo Aromatic

d) i) What are Unsaturated and saturated hydrocarbons?

ii) Explain the term - a)pseudo Aromatic b) Non-Aromatic, c) Antiaromatic d) Aromatic

e) Define Cycloalkanes. Give methods of Preparation of Cycloalkanes.

f) What is Carbanion ? Explain the term 1)Generation, 2)Reactions.

g) Define Organic Chemistry ? Explain Different Types of Organic Reaction.

h) Define Alkanes. Give methods of Preparation of Alkanes.

c) State and Explain Huckel's Rule. Give examples of Aromatic, Non- Aromatic and Anti aromatic

i) Define Alkenes. Give methods of Preparation of Alkenes.

j) Define Alkynes. Give methods of Preparation of Alkynes.

k) Explain in detail optical isomerism in tartaric acid.

l) Write a note on a) Huckels rule b) Aromaticity

m) What are free radicals? Give methods of preparation and reactions of free radicals.

n) Explain the structure and stability of Carbocation and give its reaction.

o) What is geometric isomerism? Explain the method of determining the configuration of ketoxime.

**Q.3: Attempt the following.** **[5 Marks]**

i. Explain in brief Stereoisomerism.

ii. Describe the term free radicals with suitable example.

iii. What is the action of following reagents on cyclopropane?

a. $Cl_2$ b. $H_2$/ Ni. c) HCl d) Pt/Δ e) HX

iv. Describe the term Aliphatic hydrocarbon.

v. Define resonance effect. Write three resonance structures for $CH_3$- CH= CH-CHO Indicate their relative stability.

vi. Explain the term D and L nomenclature of stereoisomers with suitable examples.

vii. What is free radical? Explain methods for formation of free radicals.

viii. Define resonance effect. Draw resonance structure for $CH_2$=CH-CH=$CH_2$

ix. Explain in brief Diastereomers.

x. What is the action of following reagents on cyclopropane?

a. $Cl_2$ b. $H_2$/ Ni. c) HCl d) Pt/Δ e) HX

xi. Describe the term Carbocation with suitable example.

xii. Explain methods of benzyne generation.

xiii. What is hydrocarbon? Write the classification of hydrocarbon.

xiv. Explain in brief the resonance structure of benzene.

xv. Explain modern theory of aromaticity.

xvi. Write a note on Huckels rule.

xvii. What is the action of following reagents on cyclopropane?

a) $Br_2$ b) $H_2$/ Ni. c) HBr d) Pt/Δ e) HX

xviii. Give methods of Preparation of Alkenes.

xix. Explain the term - a)pseudo Aromatic b) Non-Aromatic

xx. Explain the term - a) Antiaromatic b) pseudo Aromatic

xxi. Write methods of preparation of carbanion.

xxii. Explain chemical reactions of carbocation

xxiii. Write chemical reactions of Carbene

xxiv. Explain the following reactions with respect to carbene

a) cycloaddition b) Rearrangement c) Ring expansion

xxv. Explain the stability of carbanion.

xxvi. Explain Optical isomerism in 2,3- Dihydroxy Butanoic acid

xxvii. explain in brief R and S system

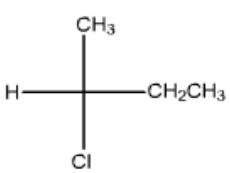
xxviii. state with reasons whether the following compounds show geometrical isomerism or not.

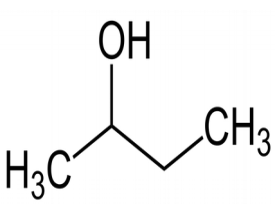
a) $(CH_3)_2C=CH(OH)$ b) $CH_3$-CH=CH-$CH_3$ c) $CH_3CH=CH_2$

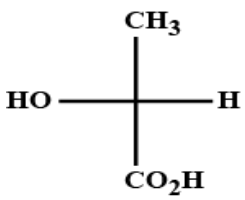
d) $Cl_2C=CHCH_3$ e) $(C_2H_5)_2C=C(CH_3)_2$

xxix. Assign R or S configuration to the following compounds.

1) 2) 3)



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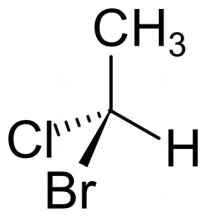
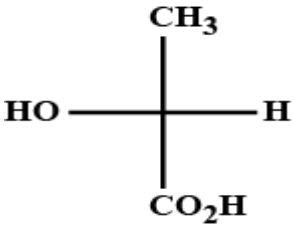



5)




xxx. Explain the term - pseudo Aromatic

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## B. Sc. I (Sem II)
## Question Bank

## Analytical Chemistry (BDCT-206)

**Q. 1 Answer in one sentence** **[2 Marks]**

1) Define the terms Basicity of Acid
2) Which methods are used for softening of water?
3) Name some chromatographic techniques.
4) Define Underground water with suitable example.
5) Name different types of condensers used in distillation.
6) Define the terms a) Normality. b) Molality
7) Give the applications of paper Chromatography
8) What is steam distillation? When is it used ?
9) Define Sublimation. When is it used ?
10) Define the terms Acidity of Base.
11) Give the applications of Thin Layer Chromatography
12) Define the terms a) Gram equivalent weight b) Molarity
13) Define a)equivalent weight b) Molecular weight
14) Give the applications of Chromatography technique.
15) Define the terms a)Dissolved Oxygen b) Biochemical Oxygen Demand
16) Define filtration? When is it used?
17) Define Hardness with suitable example.
18) Give the uses of Chemical oxygen Demand.
19) Define Percentage composition by weight and by volume.
20) Give the different types of Chromatography.
21) Define Chromatography. Give the Advantages of Chromatography technique.
22) Define the terms a) Weight fraction b) Mole fraction
23) Define Surface water with suitable example.
25) Give disadvantages of Chemical methods used for sterilization of water.

**Q.2: Attempt the following.** **[10 Marks]**

a) Explain different physical methods used for sterilization of water.
b) Describe the principle, methodology and applications of Thin layer Chromatography
c) What is Distillation? Explain any two methods of distillation.
d) Explain different Chemical methods used for sterilization of water.
e) Explain in brief classification of Chromatography
f) I) Explain the terms Basicity of Acid and Acidity of Base.

II) Calculate the normality and molarity of $H_2SO_4$ when 9.8 gm of $H_2SO_4$ are dissolved in $1dm^3$ of solution (Eq. Wt of $H_2SO_4$ = 49 and Mol. Wt of $H_2SO_4$ = 98)

g) Describe various applications of paper Chromatography and Thin layer Chromatography
h) Explain in brief various chemical substances affecting potability of water.
i) Describe the principle, methodology and applications of paper Chromatography.
j) Explain in brief a)Alkalinity of water b) Acidity of water.
k) Explain any five of the following term used in examination of water
   a) BOD, b) COD, c) DO, d) Turbidity, e) Suspended solid
l) Explain in brief technique of filtration, Choice of solvent, petroleum ethers, and Mixed solvents.
m) Explain the term Re-crystallization and Sublimation technique.
n) Explain the terms 1) Fractional distillation 2) Kugelrohr distillation
o) Explain various chemical and physical methods used for examination of water.

**Q.3: Attempt the following. [5 Marks]**

i. Explain electrolyte with suitable example.
ii. Explain in detail - source of water.
iii. Explain in detail ion exchange Method.
iv. Explain the terms - a) acidic buffer solution b) basic buffer solution
v. Explain the term - Sublimation.
vi. Explain the term crystallization with suitable example.
vii. Give the difference between electrolyte and non- electrolyte
viii. Explain in detail - Acidity of water
ix. What is the Common ion effect? Explain with suitable example
x. Explain the term - Turbidity of water
xi. Explain in brief Portability of Water.
xii. Explain in detail - Alkalinity.
xiii. Explain the term -Recrystallization.
xiv. Explain saturated, unsaturated and supersaturated solutions.
xv. Define pH and pOH. Derive relationship between pH and pOH.
xvi. Explain the technique of crystallization with example.
xvii. Explain the term Hydrogen ion concentration.
xviii. Explain the term COD.
xix. Explain in detail - Distillation
xx. Define Distillation. Draw a labeled diagram of simple distillation.
xxi. Give the difference between paper Chromatography and Thin layer Chromatography
xxii. Explain in brief electrolytes and non- electrolytes
xxiii. Explain the term a) Underground water b) Surface water
xxiv. Explain in brief kugelrohr distillation technique.
xxv. How does a fractional column give pure distillate?
xxvi. Explain advantages of using fractional column in distillation.

xxvii. What are parts per million, parts per billion and parts per trillion solutions? Explain in brief.

xxviii. What do you mean by molarity and molality? Explain molarity of mixed solution.

xxix. Explain in detail - steam Distillation

xxx. Explain Non- electrolyte with suitable example.