

CHEMISTRY
CLASS :XII

SET 1 Term -1

TIME : 90 Min

MM : 35

General Instructions: Read the following instructions carefully.

- a) The question paper contains three sections.
- b) Section A has 25 questions. Attempt any 20 questions.
- c) Section B has 24 questions. Attempt any 20 questions.
- d) Section C has 6 questions. Attempt any 5 questions.
- g) All questions carry equal marks.
- h) There is no negative marking.

SECTION-A

This section consists of 25 multiple choice questions with overall choice to attempt **ANY 20** questions. In case more than desirable number of questions are attempted only first 20 will be considered for evaluation.

1. A compound formed by elements A and B crystallizes in a cubic structure in which A atoms are at the centre of the cube and B atoms are at corners. The formula of the compound is

- (a) AB
- (b) A_2B
- (c) AB_8
- (d) AB_4

2. In CsCl structure the nearest neighbours of each Cs ion are

- (a) Six Chloride ions
- (b) Eight Cs ions
- (c) Six Cs ions
- (d) Eight Chloride ions

3. Which of the following does not exhibit Frankel defect

- (a) AgBr (b) AgCl (c) KBr (d) ZnS

4. An element having bcc structure has 12.08×10^{23} unit cells. The number of atoms in these cells is
(a) 12.08×10^{23} (b) 24.16×10^{23}
(c) 48.38×10^{23} (d) 12.08×10^{22}
5. K_b for water is 0.52 K/m Then 0.1 molal solution boils at
(a) 100.52°C (b) 100.052°C
(c) 100.04°C (d) 100.104°C
6. A solution of Sulphuric acid in water
a. is an ideal solution
b. obeys Raoult's law
c. shows negative deviation
d. shows positive deviation
7. Nitrogen is liberated by the thermal decomposition of
(a) NH_4NO_2 (b) NaN_3
(c) $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$ (d) All the three
8. The outermost electronic configuration of the most electronegative element is
(a) $ns^2 np^3$ (b) $ns^2 np^4$ (c) $ns^2 np^5$ (d) $ns^2 np^6$
9. Which species has the maximum number of lone pair of electrons on the central atom?
(a) $[\text{ClO}_3]^-$ (b) XeF_4 (c) SF_4 (d) $[\text{I}_3]^-$
10. The ionization constant of phenol is higher than that of ethanol because :
a. phenoxide ion is bulkier than ethoxide
b. phenoxide ion is stronger base than ethoxide
c. phenoxide ion is stabilized through resonance
d. phenoxide ion is less stable than ethoxide
11. Which of the following is not true in case of reaction with heated copper at 300°C ?
(a) Phenol in to Benzyl alcohol
(b) Secondary alcohol in to Ketone
(c) Primary alcohol in to Aldehyde

(d) Tertiary alcohol in to Olefin

12. Which one is formed when sodium phenoxide is heated with ethyl iodide?
- Ethoxy Benzene
 - Ethyl phenyl alcohol
 - Phenol
 - None of these
13. Reduction of glucose by HI suggest that
- presence of OH groups
 - presence of $-CHO$ group
 - cyclic structure of glucose
 - six carbon atoms are arranged in straight chain
14. Which of the following statement(s) is/are correct?
- Information regarding the sequence of nucleotides in the chain of a nucleic acid is called its primary structure.
 - In secondary structure of DNA adenine forms hydrogen bonds with guanine whereas cytosine forms hydrogen bonds with thymine.
 - RNA molecules are of three types' m-RNA, r-RNA and t-RNA and they all perform different functions.
- (a) (ii) only (b) (i) and (iii) (c) (ii) and (iii) (d) (iii) only
15. Which of the following is an example of globular proteins?
- Glycine
 - Albumin
 - Alanine
 - Both (a) and (b)
16. Which one of the following statements about packing in solids is incorrect?
- Coordination number in bcc mode of packing is 8.
 - Coordination number in hcp mode of packing is 12.
 - Void space in hcp mode of packing is 32%.
 - Void space in ccp mode of packing is 26%.

(c) Mole fraction

(d) None of above

24. The relation between atomic radius (r) and edge length (a) of a body centered cubic unit cell is

(a) $r = a/2$

(b) $r = \sqrt{a}/2$

(c) $r = \sqrt{3}a/2$

(d) $r = \sqrt{3}a/4$

25. The chemical name of Anisole is

(a) Propanone

(b) Acetone

(c) Acetoxy benzene

(d) Methoxy benzene

SECTION-B

This section consists of 24 multiple choice questions with overall choice to attempt **ANY 20** questions. In case more than desirable number of questions is attempted only first 20 will be considered for evaluation

26. Total number of voids in 0.5 mole of a compound having hexagonal close packed structure is

(a) 6.022×10^{23}

(b) 3.011×10^{23}

(c) 4.516×10^{23}

(d) 9.033×10^{23}

27. The molarity of NaOH solution formed by dissolving 4g of it in 250 ml of water is

(a) 0.4 M

(b) 0.8 M

(c) 0.2 M

(d) 0.1 M

28. A 5% solution of cane sugar (molar mass =342) is isotonic with 1% solution of a substance X, The molar mass of X is

(a) 171.2 gmol^{-1}

(b) 68.4 gmol^{-1}

(c) 34.2 gmol^{-1}

(d) 136.2 gmol^{-1}

29. Propene subjected to hydroboration and oxidation yields

a. Propane

(b) Propan-1-ol

(c) Propan-2-ol

(d) Propanone

30. Fluorine is a good oxidising agent in solutions than chlorine because

a. Bond dissociation of F₂ is less than that of Chlorine.

b. Fluorine has less negative electron gain enthalpy than that of chlorine.

c. Fluoride ion has greater hydration enthalpy.

d. Both (a) and (c)

31. Atomicity of sulphur in rhombic sulphur is

(a) 1

(b) 2

(c) 8

(d) 6

32. Which one of the following order is correct for the bond energies of halogen molecules?

a. $I_2 > Cl_2 > Br_2$

(b) $Br_2 > Cl_2 > I_2$

(c) $I_2 > Br_2 > Cl_2$

(d) $Cl_2 > Br_2 > I_2$

33. In XeF_2 , XeF_4 , XeF_6 the number of lone pairs on Xe are respectively

(a) 2, 3, 1

(b) 1, 2, 3

(c) 4, 1, 2

(d) 3, 2, 1.

34. Which one of the following is not an allylic halide?

(a) 4-Bromopent-2-ene

(b) 3-Bromo-2-methylbut-1-ene

(c) 1-Bromobut-2-ene

(d) 4-Bromobut-1-ene

35. Conversion of ethyl bromide to ethylene is an example of :

(a) Hydrohalogenation

(b) Intramolecular dehydrohalogenation

(c) Dehydration

(d) Hydration

36. Glucose gives silver mirror test with Tollen's reagent. It shows the presence of

(a) Acidic group

(b) alcoholic group

(c) Ketonic group

(d) aldehyde group

37. Which statement is not correct about alcohol?

a. Molecular weight of alcohol is higher than water

b. Alcohol of less number of carbon atoms is less soluble in water than alcohol of more number of carbon atoms

c. Alcohol evaporates quickly than water

d. None of the above

38. Which of the following compounds is oxidised to prepare methyl ethyl ketone?

'O' atoms at the centre of edges and 'Na' atoms at the centre of the cube. The formula for the compound is :

- (a) NaWO_2 (b) NaWO_3
(c) Na_2WO_3 (d) NaWO_4

45. Assertion (A): When NaCl is added to water a depression in freezing point is observed
Reason(R): Lowering of vapour pressure of solution causes depression in freezing point

- a) A and R both are correct statements and reason is correct explanation for A.
b) A and R both are correct statements but R is not correct explanation for A.
c) A is correct statement but R is wrong statement.
d) A is wrong statement but R is correct statement

46. Assertion (A) : Molality of a solution changes with temperature

Reason(R): Volume of a solution changes with temperature

- a) A and R both are correct statements and reason is correct explanation for A.
b) A and R both are correct statements but R is not correct explanation for A.
c) A is correct statement but R is wrong statement.
d) A is wrong statement but R is correct statement.

47. Assertion (A): S_2 is paramagnetic as O_2

Reason(R): S_2 has unpaired electrons in molecular orbital just as O_2 .

- a) A and R both are correct statements and reason is correct explanation for A.
b) A and R both are correct statements but R is not correct explanation for A.
c) A is correct statement but R is wrong statement.
d) A is wrong statement but R is correct statement.

48. Assertion (A): D(+) Glucose is Dextrorotatory in nature

Reason(R): D represents Dextrorotatory nature of Glucose

- a) A and R both are correct statements and reason is correct explanation for A.
b) A and R both are correct statements but R is not correct explanation for A.
c) A is correct statement but R is wrong statement.
d) A is wrong statement but R is correct statement

49. Assertion (A): Ethanol is weaker acid than Phenol

Reason(R): Ethanol is soluble in water.

- a) A and R both are correct statements and reason is correct explanation for A.
b) A and R both are correct statements but R is not correct explanation for A.
c) A is correct statement but R is wrong statement.

d) A is wrong statement but R is correct statement

SECTION-C

This section consists of 6 multiple choice questions with overall choice to attempt 5. In case more than desirable number of questions is attempted Only First 5 will be considered for evaluation

50. Match the compounds given in Column I with the hybridisation and shape given in Column II and mark the correct option.

Column I	Column II
(A) XeF ₆	(1) sp^3d^3 – distorted octahedral
(B) XeO ₃	(2) sp^3d^2 - square planar
(C) XeOF ₄	(3) sp^3 – pyramidal
(D) XeF ₄	(4) sp^3d^2 - square pyramidal

- (a) A (1) B (3) C (4) D (2)
(b) A (1) B (2) C (4) D (3)
(c) A (4) B (3) C (1) D (2)
(d) A (4) B (1) C (2) D (3)

51. Na and Mg crystallize in bcc and fcc type crystals respectively, then the number of atoms of Na and Mg present in the unit cell of their respective crystal is

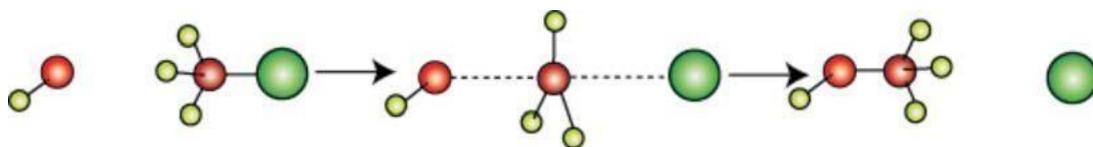
- (a) 4 and 2
(b) 9 and 14
(c) 14 and 9
(d) 2 and 4

52. Molarity of aqueous HCl will be, if density of solution is 1.17 g/cc

- (a) 36.5 molL⁻¹
(b) 32.05 molL⁻¹
(c) 18.25 molL⁻¹
(d) 42.10 molL⁻¹

CASE-1 Read the Passage and answer the following questions 53-55

A substitution reaction takes place and halogen atom, called leaving group departs as halide ion. Since the substitution reaction is initiated by a nucleophile, it is called nucleophilic substitution reaction. The nucleophilic substitution of Haloalkanes can proceed via SN¹



SUBJECT : CHEMISTRY
CLASS :XII

ANSWER KEY FOR SET 1 Term 1

SECTION -A	ANS	SECTION -B	ANS	SECTION- C	ANS
1	a	26	d	50	a
2	d	27	a	51	d
3	c	28	b	52	b
4	b	29	b	53	a
5	b	30	d	54	c
6	c	31	c	55	a
7	d	32	d		
8	c	33	d		
9	d	34	d		
10	c	35	b		
11	a	36	d		
12	a	37	b		
13	d	38	c		
14	b	39	c		
15	b	40	c		
16	c	41	d		
17	b	42	c		
18	b	43	a		
19	c	44	d		
20	b	45	a		
21	a	46	d		
22	b	47	a		
23	a	48	c		
24	d	49	b		
25	d				

**CHEMISTRY
CLASS :XII**

SET 2 Term-1

2021-22

Time: 90 Minutes

Max. Marks: 35

General Instructions:

- The Question Paper contains three sections.
- Section A has 25 questions. Attempt any 20 questions.
- Section B has 24 questions. Attempt any 20 questions.
- Section C has 6 questions. Attempt any 5 questions.
- All questions carry equal marks.
- There is no negative marking.

SECTION A

This section consists of 25 multiple choice questions with overall choice to attempt **any 20** questions. In case more than desirable number of questions are attempted, **ONLY** first 20 will be considered for evaluation.

1. What type of defect is produced when NaCl is doped with SrCl₂?
 - a) Dislocation defect
 - b) Impurity defect
 - c) Metal excess defect
 - d) Schottky defect
2. Aqua Regia is
 - a) 1 part Conc. HCl & 3 parts Conc. Sulphuric acid
 - b) 3 parts Conc. HCl & 1 Part Conc..Nitric acid
 - c) 3 parts Conc. HCl & 1 part Conc.. Sulphuric acid
 - d) 1 part Conc. HCl & 3 parts Conc..Nitric acid

3. Which of the following arrangements correctly represents ccp and hcp in three dimensions respectively?
- ABC ABC.... and ABAB...
 - ABAB... and ABCABC...
 - Both have ABAB...arrangement
 - Both have ABCABC.. arrangement
4. How many moles of SO_2 react with one mole KMnO_4 of in acidic medium?
- 1
 - 2
 - 2.5
 - 3
5. A compound is formed by two elements M and N. The element N forms hcp and atoms of M occupy $\frac{2}{3}$ rd of octahedral voids. What is the formula of the compound?
- M_3N_2
 - M_2N_3
 - MN
 - MN_3
6. The physical state of iodine at room temperature is
- Solid
 - Liquid
 - Gas
 - Vapour
7. α - helix structure is a type of
- Primary structure of protein
 - Secondary structure of protein
 - Tertiary structure of protein
 - DNA
8. Which compound inspired N. Bartlett to prepare a Noble gas compound?
- $\text{Xe}^+[\text{PtF}_6]^-$
 - $\text{O}_2^+[\text{PtF}_6]^-$
 - PtF_6
 - $\text{N}_2^+[\text{PtF}_6]^-$

9. The full form of DNA is
- Double nucleic acid
 - Ribonucleic acid
 - Deoxyribonucleic acid
 - Dextrose nucleic acid
10. Chlorine gas is prepared by
- Deacon's Process
 - Contact Process
 - Ostwald Process
 - Haber's Process
11. The boiling point of HF is more than HCl due to
- Intermolecular hydrogen bonding
 - Intramolecular hydrogen bonding
 - High electronegativity of F
 - Molecular mass of HF is less than HCl
12. Which is most acidic and reducing agent among HCl, HF, HBr, HI ?
- HCl
 - HF
 - HBr
 - HI
13. Which of the following is an amorphous solid?
- Graphite (C)
 - Glass (SiO_2)
 - Chrome alum
 - Silicon carbide SiC
14. α and β -D-glucose are related as
- Enantiomers
 - Diastereomers
 - Anomers
 - Polymers

15. Which reagent is used to convert phenol to benzene?

- a. NaBH_4
- b. Na
- c. Zn-HCl
- d. Zn

16. The relative ease of dehydration of isomeric alkyl alcohols is

- a) Primary < Secondary. < Tertiary
- b) Tertiary < Primary < Secondary.
- c) Tertiary < Secondary. < Primary
- d) Primary = Secondary. < Tertiary

17. Which linkage is present between two nucleotides in DNA?

- a) Phosphodiester
- b) Glycosidic
- c) Peptide
- d) None of the above

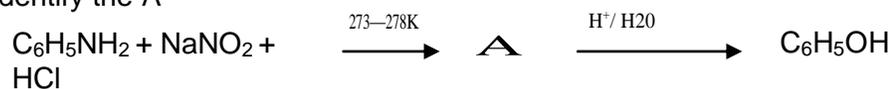
18. Which is a Chiral molecule?

- a. Butan-1-ol
- b. Butan-2-ol
- c. Propan-2-ol
- d. Propan-1-ol

19. Which of the following carbohydrate is present in DNA?

- a) D-ribose
- b) β -D-2-deoxyribose
- c) α -D-deoxyribose
- d) α -D-2-deoxyribose

20. Identify the A



- a) Aniline hydrochloride
- b) Benzyl chloride
- c) Nitro benzene
- d) Benzene diazonium chloride

21. Which is not a dihydric phenol?

- a) o-Cresol
- b) Catechol
- c) Resorcinol
- d) Hydroquinone

22. Which of the following is an ambident nucleophile?

- a) CN^-
- b) Cl^-
- c) NH_2^-
- d) OH^-

23. $\text{S}_\text{N}2$ reaction is a

- a) One step reaction
- b) Two step reaction
- c) Three step reaction
- d) Four step reaction

24. The molal elevation constant depends upon

- a) nature of solute.
- b) nature of the solvent.
- c) vapour pressure of the solution.
- d) enthalpy change.

25. Lucas reagent is

- a. a mixture of Zn & HCl
- b. 2,4-Dinitrophenyl hydrazine
- c. a mixture of ZnCl_2 & Conc. H_2SO_4
- d. a mixture of ZnCl_2 & Conc. HCl

SECTION B

This section consists of 24 multiple choice questions with overall choice to attempt **any 20** questions. In case more than desirable number of questions are attempted, **ONLY** first 20 will be considered for evaluation.

26. Which isomer of $C_5H_{11}Br$ is a tertiary alkyl halide?

- a) 1-Bromopentane
- b) 2-Bromopentane
- c) 2-Bromo-2-methyl butane
- d) 1-Bromo-2,2-dimethylpropane

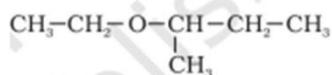
27. The formula of Vinyl Chloride is

- a) $CH_2=CH-CH_2Cl$
- b) $CH_2=CHCl$
- c) $CH_3-CH_2-CH_2Cl$
- d) $CH_3CH=CHCl$

28. The C-Cl bond length is minimum in

- a) C_6H_5Cl
- b) $C_6H_{11}Cl$
- c) C_2H_5Cl
- d) CH_3Cl

29. The IUPAC name of following compound is



- a) 2-Ethoxybutane
- b) 2-Ethoxy-1-methylpropane
- c) sec.butyl ethyl ether
- d) 1-Methyl-2-ethoxypropane

30. How many asymmetric carbon atoms are present in glucose and fructose respectively?

- a) 2 & 4
- b) 4 & 2
- c) 4 & 4
- d) 4 & 3

31. Which product is formed when glucose reacts with HI?
- Gluconic acid
 - Saccharic acid
 - n-Hexane
 - Iodo hexane
32. In E. coli DNA the AT/CG ratio is 0.93. If the number of moles of adenine in its DNA sample are 4,65,000 then no. of moles of guanine present are
- 0.93
 - 4,65,000
 - 5×10^5
 - 5×10^4
33. Which gas is produced when ammonium sulphate reacts with Conc. NaOH ?
- N_2
 - NH_3
 - N_2O
 - NO
34. When aqueous solution of ammonia is added in copper sulphate solution a deep blue complex is formed. The formula of complex is
- $[Cu(NH_3)_6]SO_4$
 - $[Cu(NH_3)_4]SO_4$
 - $[Cu(NH_3)_5]SO_4$
 - $CuSO_4 \cdot 6 NH_3$
35. What are the products formed when Cl_2 reacts with dilute NaOH?
- NaCl & NaOCl
 - NaCl & HOCl
 - NaCl & $NaClO_3$
 - HCl + H_2O
36. The correct order of bond enthalpy is
- $F_2 < Cl_2 < Br_2 < I_2$
 - $I_2 < Br_2 < Cl_2 < F_2$
 - $I_2 < F_2 < Br_2 < Cl_2$
 - $F_2 < I_2 < Br_2 < Cl_2$

37. Acid used for permanent etching on glass surface is
- HF
 - HCl
 - HBr
 - HI
38. Identify the product of following reaction
- $$(\text{CH}_3)_3\text{C}-\text{O}-\overset{\text{KI}}{\text{C}_2\text{H}_5} \xrightarrow{\quad} \quad <$$
- $(\text{CH}_3)_3\text{C}-\text{I}$ and $\text{C}_2\text{H}_5\text{OH}$
 - $(\text{CH}_3)_3\text{C}-\text{OH}$ and $\text{C}_2\text{H}_5\text{I}$
 - $(\text{CH}_3)_3\text{CH}$ and $\text{C}_2\text{H}_5\text{I}$
 - $(\text{CH}_3)_3\text{C}-\text{I}$ and C_2H_6
39. Arrange Pentan-2-ol , Pentan-1-ol , Pentanal , n-Butane in the increasing order of boiling point.
- Pentan-2-ol < Pentan-1-ol < Pentanal < n-Butane
 - Pentanal < n-Butane < Pentan-2-ol < Pentan-1-ol
 - n-Butane < Pentan-2-ol < Pentan-1-ol < Pentanal
 - n-Butane < Pentanal < Pentan-2-ol < Pentan-1-ol
40. Which of the following is a halogen exchange reaction?
- Swart reaction
 - Wurtz Reaction
 - Sandmeyer's Reaction
 - Wurtz- Fittig Reaction
41. The law which indicates the relationship between solubility of a gas in liquid and pressure is
- Raoult's law
 - Henry's law
 - Lowering of vapour pressure
 - Van't Hoff law
42. An element atomic mass 100 g/mol having bcc structure has edge length 400 pm The density of element is
- 2.144 g/cm³
 - 5.2 g/cm³
 - 4.2 g/cm³
 - 3.2 g/cm³

43. Low concentration of oxygen in the blood and tissues of people living at high altitude is due to-

- a) low temperature
- b) low atmospheric pressure
- c) high atmospheric pressure
- d) both low temperature and low atmospheric pressure

44. Which of the following statements is true:

- a) Melting point of Phosphorous is less than that of Nitrogen
- b) N_2 is highly reactive while P_4 is inert
- c) Nitrogen shows higher tendency of catenation than P
- d) N-N is weaker than P-P

Note ::

Q.No.45-49 are assertion reason type questions Select the most appropriate answer from the options given below:

45. **Assertion:** Elevation in boiling point and depression in freezing point are colligative properties.

Reason : All colligative properties are used for the calculation of molecular masses.

- a) Both A and R are true and R is the correct explanation of A
- b) Both A and R are true but R is not the correct explanation of A.
- c) A is true but R is false.
- d) A is false but R is true.

46. **Assertion:** Reverse osmosis is used in the desalination of sea water.

Reason : When pressure more than osmotic pressure is applied; purewater is squeezed out of the sea water through the semi permeable membrane.

- a) Both A and R are true and R is the correct explanation of A
- b) Both A and R are true but R is not the correct explanation of A.
- c) A is true but R is false.
- d) A is false but R is true.

47. **Assertion:** Cooking time is reduced in pressure cooker.

Reason : Boiling point of water inside the pressure cooker is lowered

- a) Both A and R are true and R is the correct explanation of A
- b) Both A and R are true but R is not the correct explanation of A.
- c) A is true but R is false.
- d) A is false but R is true.

48. **Assertion:** An aqueous solution of NaCl freezes below 273 K.

Reason: Vapour pressure of the solution is less than that of the pure solvent.

- a) Both assertion and reason are true and reason is the correct explanation of assertion.
- b) Both assertion and reason are true but reason is not the correct explanation of assertion.
- c) Assertion is true but reason is false.
- d) Both Assertion and Reason are false.

49. **Assertion ::** The bleaching action of SO_2 is temporary and Chlorine is permanent.

Reason :: SO_2 bleach the colour by oxidation and Cl_2 by reduction.

- a) Both assertion and reason are true and reason is the correct explanation of assertion.
- b) Both assertion and reason are true but reason is not the correct explanation of assertion.
- c) Assertion is true but reason is false.
- d) Both Assertion and Reason are false.

SECTION C

This section consists of 6 multiple choice questions with an overall choice to attempt any 5. In case more than desirable number of questions are attempted, ONLY first 5 will be considered for evaluation.

50. Match the following:

Column I	Column II
A- Hypertonic	1. Solutions having same osmotic pressure
B- Isotonic	2. Solution having higher osmotic pressure than the second solution
C- Molality	3. Solutions which obey Raoult's law
D- Ideal solutions	4. Independent of temperature

Which of the following is the best matched options?

- a) A-4 B-3 C-2 D1
- b) A-1 B-2 C-3 D 4
- c) A-2 B-1 C-4 D-3
- d) A-3 B-4 C-2 D-1

51. Which analogy is correct ?

- a) Trigonal planar :: SO_2 :: sp^2
- b) Pyramidal :: XeO_3 :: sp^3
- c) See saw :: XeF_4 :: sp^3d^2
- d) Square Pyramidal :: NH_3 :: sp^3

52. Gold atomic radius 0.144 nm crystallises in fcc unit cell, what is the length of side of unit cell?

- a) 1.07 nm
- b) 1.11 nm
- c) 2.07 nm
- d) 0.407 nm

CASE STUDY: Read the passage given below and answer the following questions 53-55

The properties of the solutions which depend only on the number of solute particles but not on the nature of the solute are called colligative properties. Relative lowering in vapour pressure is also an example of colligative properties. For an experiment, sugar solution is prepared for which lowering in vapour pressure was found to be 0.061 mm of Hg. (vapour pressure of water at 20°C is 17.5 mm of Hg).

Answer the following MCQs by choosing the most appropriate options:

53. Relative lowering of vapour pressure for the given

- solution is-
- a. 0.00348
 - b. 0.061
 - c. 0.122
 - d. 0.9996

54. The vapour pressure (mm of Hg) of Solution is

- a) 17.5
- b) 0.61
- c) 17.439
- d) 0.00348

55. If weight of sugar taken is 5 g in 108 g of water then molar mass of sugar will be

- a) 358 g/mol
- b) 120 g/mol
- c) 240 g/mol
- d) 400 g/mol

Class XII
Chemistry
Answer Key
Set-2
Term 1

SECTION A		SECTION B		SECTION C	
Question No.	Correct option	Question No.	Correct option	Question No.	Correct option
1.	b	26.	c	50.	c
2.	b	27.	b	51.	b
3.	a	28.	a	52.	d
4.	c	29.	a	53.	a
5.	b	30.	d	54.	c
6.	a	31.	c	55.	c
7.	b	32.	d		
8.	b	33.	b		
9.	c	34.	b		
10.	a	35.	a		
11.	a	36.	c		
12.	d	37.	d		
13.	b	38.	a		
14.	c	39.	d		
15.	d	40.	a		
16.	a	41.	b		
17.	a	42.	b		
18.	b	43.	b		
19.	b	44.	d		
20.	d	45.	b		
21.	a	46.	a		
22.	b	47.	c		
23.	a	48.	a		
24.	b	49.	c		
25.	d				

Class XII
Subject: Chemistry
Set-3 Term -1

Time:90 Minutes

M.M.: 35

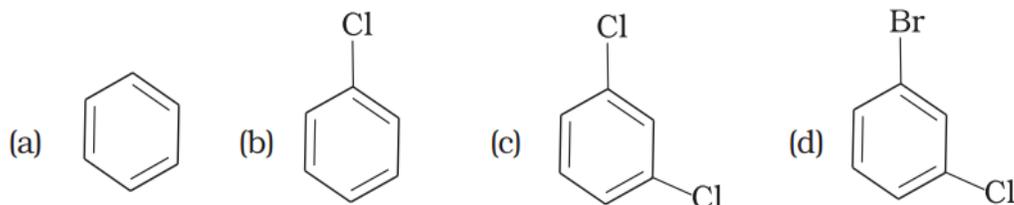
General Instructions :

- (i) The Question Paper contains three sections.
 - (ii) Section A has 25 questions. Attempt any 20 questions.
 - (iii) Section B has 24 questions. Attempt any 20 questions.
 - (iv) Section C has 6 questions. Attempt any 5 questions.
 - (v) All questions carry equal marks.
 - (vi) There is no negative marking..
 - (vii) Please check that this question paper contains 55 questions.
-

SECTION A

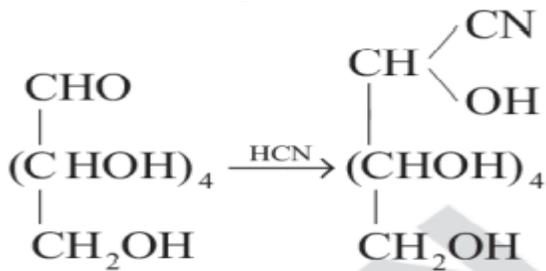
This section consists of 25 multiple choice questions with overall choice to attempt any 20 questions. In case more than desirable number of questions are attempted, ONLY first 20 will be considered for evaluation.

- Q1. Chlorine is manufactured by .
(A) Electrolysis of molten NaCl.
(B) Electrolysis of brine
(C) Decomposition of NaCl.
(D) Any of the above.
- Q2. How many crystal systems are there ?
(A) 7 (B) 8 (C) 14 (D) 6
- Q3. Moist air is an example ofsolution .
(A) Solid (B) liquid (C) gaseous (D) colloidal
- Q4. The appearance of colour in solid alkali metal halides is generally due to
(A) Interstitial positions (B) F-centres
(C) Schottky defect (D) Frenkel defect
- Q5. Arrange the following compounds in increasing order of their densities.



- (A) (a) < (b) < (c) < (d) (B) (a) < (c) < (d) < (b)
(C) (d) < (c) < (b) < (a) (D) (b) < (d) < (c) < (a)
- Q6. Which of the following is not a monosaccharide ?
(A) Ribose (B) Maltose (C) Glucose (D) Fructose

- Q7. Williamson's synthesis involves which of the following type of mechanism when attack of an alkoxide ion on primary alkyl halide takes place ?
 (A) S_N1 (B) S_N2 (C) $E1$ (D) $E2$
- Q8. On heating ammonium dichromate and barium azide separately we get
 (A) N_2O with ammonium dichromate and NO_2 with barium azide
 (B) N_2 with ammonium dichromate and NO with barium azide
 (C) N_2O with ammonium dichromate and N_2 with barium azide
 (D) N_2 in both cases
- Q9. Which of the following compounds has least solubility in water ?
 (A) Methanol (B) Acetaldehyde (C) Acetone (D) Acetophenone.
- Q10. Glass is an example of .
 (A) Supercooled liquid (B) Crystalline solid
 (C) Non-crystalline solid (D) Non of these .
- Q11. Among the following sets of reactants which one produces anisole ?
 (A) $CH_3CHO, RMgX$ (B) $C_6H_5OH, NaOH, CH_3I$
 (C) $C_6H_5OH, neutral FeCl_3$ (D) $C_6H_5-CH_3, CH_3COCl, AlCl_3$
- Q12. Low concentration of oxygen in the blood and tissues of people living at high altitude is due to...
 (A) low temperature
 (B) low atmospheric pressure
 (C) high atmospheric pressure
 (D) both low temperature and high atmospheric pressure
- Q13. Which of the following compound will have highest boiling point ?
 (A) CH_4 (B) CH_3CHO (C) C_2H_5OH (D) $HCOOH$
- Q14. Hexafluorides of elements of group 16 have hybridization and structure respectively are
 (A) sp^3 and trigonal pyramidal (B) sp^3d and tetrahedral
 (C) sp^3d and trigonal bipyramidal (D) sp^3d^2 and octahedral
- Q15. Consider the following reaction,



The given reaction confirms

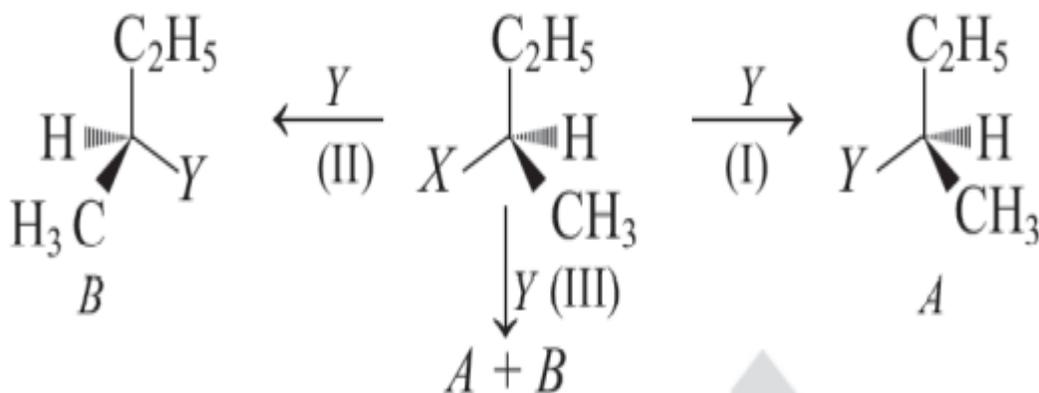
- (A) presence of primary alcoholic group
 (B) five - OH groups attached to different carbon atoms
 (C) all six carbon atoms are linked in a straight chain
 (D) the presence of a carbonyl group in glucose
- Q16. Select the by-product formed in the reaction,
 $ROH + PCl_5 \rightarrow RCl + 'A'$
 Here, A is
 (A) $POCl_3 + HCl$ (B) $H_3PO_3 + \text{No other product}$
 (C) $H_3PO_3 + HCl$ (D) $POCl_3 + \text{No other by product}$
- Q17. Silver benzoate reacts with bromine to give
 (A) C_6H_6 (B) C_6H_5COOBr
 (C) $m\text{-Br-C}_6\text{H}_4\text{COOAg}$ (D) C_6H_5Br
- Q18. A brown ring is formed in the ring test for NO_3^- ion. It is due to the formation of
 (A) $[Fe(H_2O)_5(NO)]^{2+}$ (B) $FeSO_4 \cdot NO_2$

- (C) $[\text{Fe}(\text{H}_2\text{O})_4(\text{NO}_2)]^{2+}$ (D) $\text{FeSO}_4 \cdot \text{NO}_3$
- Q19. On dissolving sugar in water at room temperature, solution feels cool to touch. Under which of the following cases dissolution of sugar will be most rapid ?
 (A) Sugar crystals in cold water (B) Sugar crystals in hot water
 (C) Powdered sugar in cold water (D) Powdered sugar in hot water
- Q20. Out of the following halides of group 16, which does not possess reducing property ?
 (A) H_2Te (B) H_2Se (C) H_2S (D) H_2O
- Q21. Which of the following bases is not present in DNA ?
 (A) Adenine (B) Thymine (C) Cytosine (D) Uracil
- Q22. What is the main source of helium ?
 (A) Air (B) monazite sand (C) Radium (D) clathrates
- Q23. The ionization constant of phenol is higher than ethanol because
 (A) phenoxide ion is stronger base than ethoxide ion.
 (B) phenoxide ion is stabilized through delocalization
 (C) phenoxide ion is less stable than ethoxide ion.
 (D) phenoxide ion is bulkier than ethoxide ion.
- Q24. Bleaching action of SO_2 is due to its
 (A) reducing property (B) oxidizing property
 (C) basic property (D) acidic property
- Q25. Percentage of free space in body centred cubic unit cell is ?
 (A) 34% (B) 28% (C) 30% (D) 32%

SECTION B

This section consists of 24 multiple choice questions with overall choice to attempt any 20 questions. In case more than desirable number of questions are attempted, ONLY first 20 will be considered for evaluation.

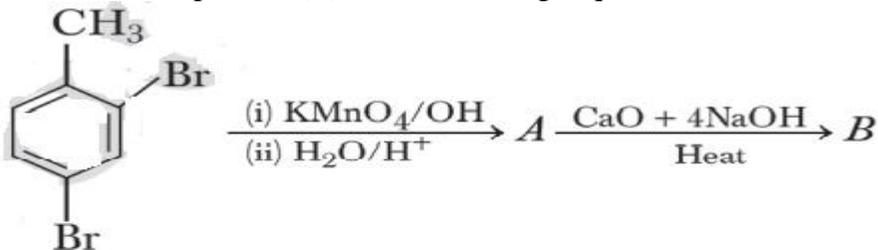
- Q26. 200 mL of an aqueous solution of a protein contains 1.26 g of protein. The osmotic pressure of this solution at 300 K is found to be 2.57×10^{-3} bar. The molar mass of protein will be ($R = 0.083 \text{ L bar mol}^{-1} \text{ K}^{-1}$)
 (A) 51022 g/mol (B) 122041 g/mol (C) 31011 g/mol (D) 61039 g/mol
- Q27. Consider the following reactions :



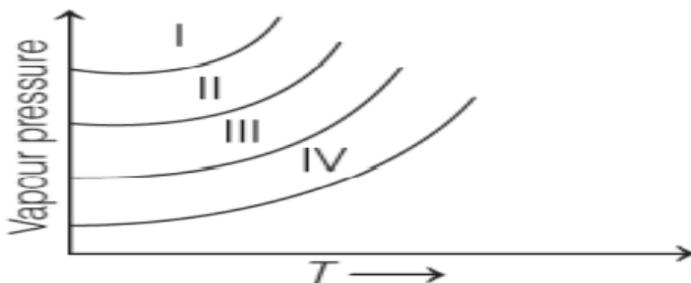
Name the terms that occur in I, II, III equations. Choose the correct option.

- | I | II | III |
|--------------------------------|----------------------------|----------------------------|
| (A) Retention of configuration | Inversion of configuration | Racemisation |
| (B) Retention of Configuration | Racemisation | Inversion of configuration |
| (C) Racemisation | Retention of configuration | Inversion of configuration |
| (D) Racemisation | Inversion of configuration | Retention of configuration |

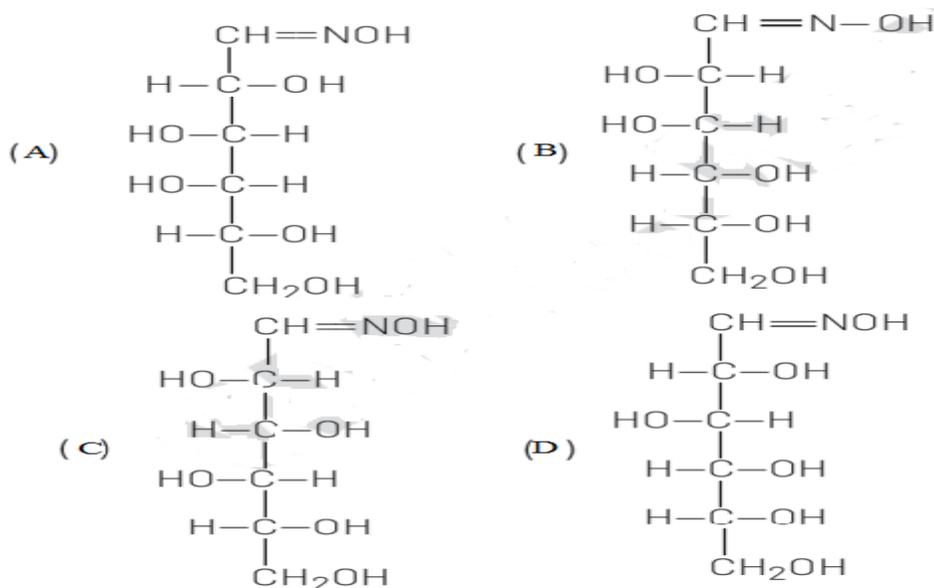
- Q28. Which product will form when hot and concentrated sodium hydroxide reacts with Cl_2 ?
 (A) NaClO (B) NaClO_2 (C) NaClO_3 (D) NaClO_4
- Q29. Which of the following statements is correct about amino acids ?
 (A) All amino acids are optically active.
 (B) All amino acids except glycine are optically active.
 (C) All amino acids except glutamic acid are optically active.
 (D) All amino acids except lysine acid are optically active.
- Q30. An ether is more volatile than an alcohol having the same molecular formula. This is due to
 (A) dipolar character of ethers
 (B) alcohols having resonance structures.
 (C) inter-molecular hydrogen bonding in ethers
 (d) inter-molecular hydrogen bonding in alcohols
- Q31. Affinity for hydrogen decreases in the group from fluorine to iodine. Which of the halogen acids should have highest bond dissociation enthalpy ?
 (A) HF (B) HCl (C) HBr (D) HI
- Q32. A compound is formed by cation P and anion Q. The anions form hexagonal close packed (hcp) lattice and the cations occupy 75% of octahedral voids. What is the formula of the compound ?
 (A) P_3Q_2 (B) P_3Q_4 (C) P_4Q_3 (D) P_2Q_3
- Q33. What will be the end product (B) in the following sequence of reactions ?



- (A) 1,2-Dibromobenzene (B) 1,2-Dibromobenzaldehyde
 (C) 1,3-Dibromobenzene (D) 1,4-Dibromobenzene
- Q34. In qualitative analysis when H_2S is passed through an aqueous solution of salt acidified with dil. HCl , a black precipitate is obtained. On boiling the precipitate with dil. HNO_3 , it forms a solution of blue colour. Addition of excess of aqueous solution of ammonia to this solution gives _____.
 (A) deep blue precipitate of $\text{Cu}(\text{OH})_2$ (B) deep blue solution of $[\text{Cu}(\text{NH}_3)_4]^{2+}$
 (C) deep blue solution of $\text{Cu}(\text{NO}_3)_2$ (D) deep blue solution of $\text{Cu}(\text{OH})_2 \cdot \text{Cu}(\text{NO}_3)_2$
- Q35. The following diagram shows the vapour pressure curves for CH_3F , CH_3OH , CH_3COOH and HCHO



- Curves I, II, III and IV respectively are for
 (A) CH_3F ; HCHO ; CH_3OH ; CH_3COOH (B) CH_3COOH ; CH_3OH ; CH_3F ; HCHO
 (C) HCHO ; CH_3F ; CH_3OH ; CH_3COOH (D) CH_3OH ; CH_3COOH ; HCHO ; CH_3F
- Q36. D-(+)- glucose reacts with hydroxylamine and yields an oxime. The structure of the oxime would be



- Q37. On heating with concentrated NaOH solution in an inert atmosphere of CO_2 , white phosphorus gives a gas. Which of the following statement is incorrect about the gas ?
 (A) It is highly poisonous and has smell like rotten fish.
 (B) It's solution in water decomposes in the presence of light.
 (C) It is more basic than NH_3 .
 (D) It is less basic than NH_3 .
38. Silver has a face centred cubic lattice with an edge length of the unit cube of 409 pm. Assuming the closest packing, the radius of the silver atom is
 (A) 144.6 pm (B) 287.8 pm (C) 244.5 pm (D) 704.9 pm
- Q39. Which of the following arrangements represents the correct order of electron gain enthalpy (with negative sign) of the given atomic species ?
 (A) $\text{S} < \text{O} < \text{Cl} < \text{F}$ (B) $\text{F} < \text{Cl} < \text{O} < \text{S}$
 (C) $\text{Cl} < \text{F} < \text{S} < \text{O}$ (D) $\text{O} < \text{S} < \text{F} < \text{Cl}$
- Q40. Thionyl chloride is preferred in the preparation of chlorine compounds from alcohol because.
 (A) The reaction goes almost to complete .
 (B) The byproducts are escapable gases
 (C) The reagent is cheap.
 (D) None of the above.
- Q41. For the sequence of reactions,
 $\text{P} \xrightarrow{\text{C}_2\text{H}_5\text{MgI}} \text{Q} \xrightarrow{\text{H}_2\text{O}/\text{H}^+} \text{tert-pentyl alcohol}$
 What is the compound P in the sequence ?
 (A) 2-Butanone (B) Acetaldehyde (C) Acetone (D) Propanal
- Q42. Which of the following statements is incorrect regarding anomalous behaviour of fluorine ?
 (A) Fluorine shows an oxidation state of -1 only.
 (B) The negative electron gain enthalpy of fluorine is less than that of chlorine.
 (C) Fluorine is the most electronegative element in the periodic table.
 (D) Fluorine has low hydration enthalpy than chlorine.
- Q43. What is the nature of ethyl alcohol ?
 (A) Acidic (B) Basic (C) Neutral (D) None of these
- Q44. 'X' on treatment with sodium hydroxide followed by the addition of silver nitrate give light Yellow precipitate at room temperature which are partially soluble in NH_4OH . 'X' can be

- (A) Chlorobenzene (B) Ethyl bromide (C) Benzyl chloride (D) Vinyl chloride

DIRECTION: In each of the following questions, a statement of Assertion is given and a corresponding

statement of Reason is given just below it. Of the statements, given below, mark the correct answer as:

- a) Both A and R are true and R is the correct explanation of A.
 b) Both A and R are true but R is not the correct explanation of A.
 c) A is true but R is false.
 d) A is false but R is true.

45.Assertion (A): Zinc oxide turns yellow on heating.

Reason (R): Zinc oxide shows metal deficiency defect.

46.Assertion (A): In face centered unit cell, atoms are at the centres of all faces.

Reason (R): Total number of atoms per unit cell is 4.

47.Assertion (A): The packing efficiency is maximum for the fcc structure.

Reason (R): The coordination number is 12 in fcc structures.

48.Assertion (A): Sulphur belongs to same period in the periodic table as oxygen.

Reason (R): S₂ has properties analogous to O₂.

49.Assertion (A):F-F bond in F₂ molecule is weak.

Reason (R): F atom is small in size.

SECTION C

This section consists of 6 multiple choice questions with an overall choice to attempt any 5. In case more than desirable number of questions are attempted, ONLY first 5 will be considered for evaluation.

Q50. Match the following catalyst given in Column I with catalysed process given in Column II.

Column I	Column II
(i) TiCl ₄	(a) wacker process
(ii) PdCl ₂	(b) Zeigler nappolymerisation
(iii) CuCl ₂	(c) contact process
(iv) V ₂ O ₅	(d) Deacon's process

(A) (i) → (a) (ii) → (b) (iii) → (c) (iv) → (d)

(B) (i) → (b) (ii) → (a) (iii) → (d) (iv) → (c)

(C) (i) → (d) (ii) → (c) (iii) → (b) (iv) → (a)

(D) (i) → (a) (ii) → (d) (iii) → (c) (iv) → (b)

Q51. Which of the following compound are have peroxy-linkage ?

(A) H₂SO₅ and H₂S₂O₆

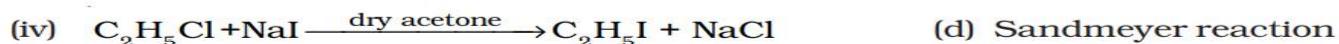
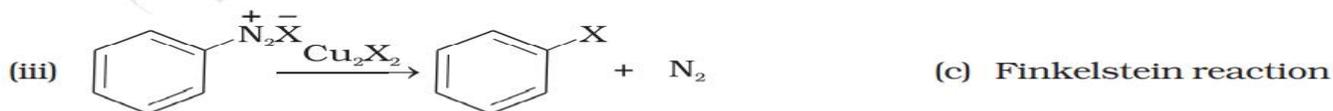
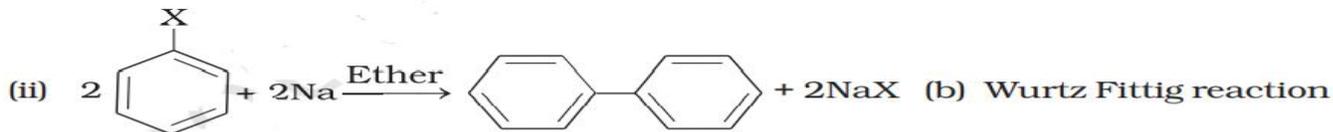
(B) H₂SO₅ and H₂S₂O₇

(C) H₂S₂O₇ and H₂S₂O₈

(D) H₂S₂O₆ and H₂S₂O₇

Q52. Match the reactions given in Column I with the names given in Column II.

Column I



Column II

(a) Fittig reaction

(b) Wurtz Fittig reaction

(c) Finkelstein reaction

(d) Sandmeyer reaction

- (A) (i) → (a) (ii) → (b) (iii) → (c) (iv) → (d)
 (B) (i) → (b) (ii) → (a) (iii) → (d) (iv) → (c)
 (C) (i) → (c) (ii) → (d) (iii) → (a) (iv) → (b)
 (D) (i) → (d) (ii) → (a) (iii) → (b) (iv) → (c)

CASE: Read the passage given below and answer the following questions 53-55

Two solutions have same osmotic pressure at a given temperature are called isotonic solutions. When such solutions are separated by semi permeable memberane , no osmosis occurs between them . For example, the osmotic pressure developed inside the blood cell is equivalent to that of 0.9 % that of sodium chloride solution called normal saline solution and it is safe to inject intravenously. On the other hand, if we place the cells in a solution containing more than 0.9% sodium chloride , water will flow out of the cells and they would shrink.Such a solution is called hypertonic.If the salt concentration is less than 0.9% , the solution is said to be hypotonic.In this case, water will flow into the cells, if placed in this solution and they would swell.

53. Which of the following solutions of NaCl is suitable for blood transfusion in humans?

- (A) 0.5% NaCl
 (B) 0.7 % NaCl
 (C) 1.1 % NaCl
 (D) 0.9 % NaCl

54. An unripe mango placed in a concentrated salt solution to prepare pickle , shrivels because:

- (A) it gains water due to osmosis
 (B) it loses water due to reverse osmosis
 (C) it gains water due to reverse osmosis
 (D) it loses water due to osmosis

55. When pure solvent flows out of the solution through the semi permeable memberane the process is called.

- (A) reverse osmosis (B) reversibe osmosis
 (C) irreversible osmosis (D) inverse osmosis

Class XII
Chemistry
Answer Key
Set-3
Term 1

SECTION A		SECTION B		SECTION C	
Question No.	Correct option	Question No.	Correct option	Question No.	Correct option
1.	B	26.	D	50.	B
2.	A	27.	A	51.	A
3.	C	28.	C	52.	A
4.	B	29.	B	53.	C
5.	A	30.	D	54.	A
6.	B	31.	A	55.	A
7.	B	32.	B		
8.	D	33.	C		
9.	D	34.	B		
10.	A	35.	A		
11.	B	36.	D		
12.	B	37.	C		
13.	C	38.	A		
14.	C	39.	D		
15.	D	40.	B		
16.	A	41.	C		
17.	D	42.	D		
18.	A	43.	D		
19.	D	44.	C		
20.	D	45.	A		
21.	D	46.	C		
22.	B	47.	D		
23.	B	48.	A		
24.	A	49.	B		
25.	A				

TERM – I, Set -4
(2021-2022)
Class –12
CHEMISTRY

Time: 90 Minutes

MM: 35

General Instructions:-

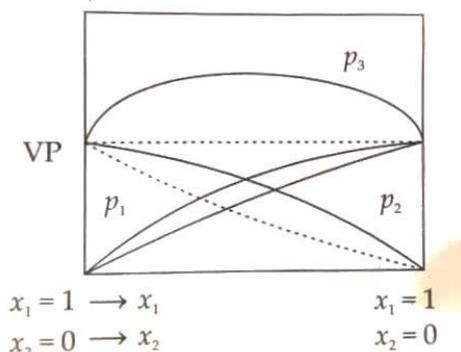
1. Each questions carry 0.77 mark.
2. The Question Paper contains three sections (A, B & C).
3. Section A has 24 questions. Attempt any 20 questions.
4. Section B has 24 questions. Attempt any 20 questions.
5. Section B has 6 questions. Attempt any 5 questions.
6. An OMR sheet of every practice paper is given. The candidate has to give his/her answer of the question by darkening the circle against that question.
7. There is no negative marking.

SECTION - A

This section consists of 25 multiple choice questions with overall choice to attempt any 20 questions. In case more than desirable number of questions are attempted, ONLY first 20 will be considered for evaluation

- Q.1 Among the given compounds, the molecular crystal is shown by
(a) ice (b) NaCl (c) graphite (d) SiC
- Q.2 In which of the following compounds nitrogen present in the highest oxidation state (O.S.)?
(a) N₂H₄ (b) NH₃ (c) NH₂OH (d) N₃H
- Q.3 Identify the reactions.
"When iodobenzene is heated with copper powder in a sealed tube, diphenyl is formed
(a) Ullmann reaction (b) Wurtz-Fitting reaction
(c) Fitting reaction (d) None of these
- Q.4 People add sodium chloride to water while boiling eggs because chloride helps to
(a) decrease the boiling point (b) increase the boiling point
(c) prevent the breading of eggs (d) None of these
- Q.5 Which of the following is the correct formula for the determenation of density of unit
(a) $\frac{a^3M}{Z \times N_0} \text{g cm}^{-3}$ (b) $\frac{M \times N_0}{a^3 \times Z} \text{g cm}^{-3}$
(c) $\frac{Z \times M}{a^3 \times N_0} \text{g cm}^{-3}$ (d) $\frac{a^3 \times N_0}{Z \times M} \text{g cm}^{-3}$
- Q.6 Which of the following reagents cannot be used to oxidise primary alcohols to aldehydes?
(a) KMnO₄ in acidic medium (b) Pyridiniumchlorochromate
(c) Cro, in anhydrous medium (d) None of these
- Q.7 When one mole of magnesium nitride is added with an excess of water, then it gives
(a) one of nitric acid (b) one mole of ammonia
(c) two moles of nitric acid (d) two moles of ammonia
- Q.8 Which of the following is the another name for thymine?
(a) 1-methyl uracil (b) 4-methyluracil
(c) 3-methyluracil (d) 5-methyluracil

- Q.9 People who takes lot of salt experience puffiness of the body. It is due to
 (a) drinking more water (b) capillary-action of water
 (c) water retention in tissues cells and intercellular spaces because of osmosis
 (d) water loss from the cells through skin tissues
- Q.10 The packing efficiency is maximum in..... structure and its coordination number is.....
 (a) fcc, 12 (b) bcc, 8 (c) simple cubic, 4 (d) ccp, 6
- Q.11 In DNA, the complementary bases are
 (a) adenine and thymine, guanine and cytosine
 (b) cytosine and guanine, uracil and adenine
 (c) adenine and thymine, guanine and uracil
 (d) guanine and adenine, thymine and cytosine
- Q.12 ΔH_{sol} of NH_4Cl is >0 . This process is an...(1)... process and the solubility increases with ...
 (i)... in temperature.
 (a) endothermic; increase (b) exothermic; decrease
 (c) endothermic; increase (d) exothermic; increase
- Q.13 Which of the following compound attacks pyrex glass?
 (a) XeF_4 (b) XeF_4 (c) XeF_6 (d) None of these
- Q.14 Look at the figure given below,



- The mixture which correctly interpret the graph is
 (a) nitric acid + water (b) benzene + chloroform
 (c) acetone + ethyl alcohol (d) water + ethyl alcohol
- Q.15 Which of the following is the most suitable reagent for the conversion of $\text{RCH}_2\text{OH} \rightarrow \text{RCHO}$
 (a) $\text{K}_2\text{Cr}_2\text{O}_7$ (b) CrO_3 (c) KMnO_4 (d) PCC
- Q.16 What is the oxidation state of Pt in $\text{Xe}^+ [\text{PtF}_6]^-$?
 (a) +3 (b) +4 (c) +6 (d) +5
- Q.17 The reactant and reagent used for the preparation of butane nitrile by heating is
 (a) propyl chloride with KCN (b) propyl alcohol with KCN
 (c) butyl chloride with KCN (d) None of the above
- Q.18 Phenol is less acidic than
 (a) p-methoxyphenol (b) p-nitrophenol
 (c) ethanol (d) All of these
- Q.19 Among the following fluorides, one which further combine with fluorine is
 (a) IF_5 (b) NaF (c) CaF_2 (d) SF_5
- Q.20 Denaturation of protein leads to loss of its biological activity by
 (a) formation of amino acids
 (b) loss of both secondary and tertiary structure
 (c) loss of primary structure. (d) None of the above

- Q.21 When phenol reacts with chloroform in presence of KOH the product formed is 'A' and the name of the reaction is 'B'.
- (a) A = salicylic acid; B-Kolbe's reaction
 (b) A=salicylaldehyde; B = Reimer-Tiemann
 (c) A phenyl salicylate; B- Kolbe's reaction
 (d) A = aspirin; B=Reimer-Tiemann reaction
- Q.22 Among noble gases (from He to Xe) only xenon reacts with oxygen and fluorine to form stable xenon fluorides and oxides because it
- (a) has the largest size (b) has the lowest ionisation enthalpy
 (c) has the highest heat of vaporisation
 (d) is most readily available in the nature.
- Q.23 The compound that does not liberate CO₂ on treatment with aqueous sodium carbonate is
- (a) salicylic acid (b) carbolic acid
 (c) benzoic acid (d) All of these
- Q.24 The correct order stability of interhalogen compounds is
- (a) IF₃ > BrF₃ > ClF₃ (b) ClF₃ > BrF₃ > IF₃
 (c) BrF₃ > IF₃ > ClF₃ (d) ClF₃ > IF₃ > BrF₃
- Q.25 If a face centered lattice of X and Y, X atoms are present at the corners while Y atoms are at the face centres, then what will be the formula of the compound?
- (a) X₂Y₃ (b) XY₃ (c) XY (d) X₃Y

SECTION B

This section consists of 24 multiple choice questions with overall choice to attempt any 20 questions. In case more than desirable number of questions are attempted, ONLY first 20 will be considered for evaluation.

- Q.26 Consider the following reaction.



Here, A, B and C respectively are

- | | A | B | C |
|-----|---------------------------------------|---|--|
| (a) | CH ₃ COCH ₃ | (CH ₃) ₃ COMgBr | (CH ₃) ₃ COH |
| (b) | CHCOOH | (CH ₃) ₂ CHOMgBr | CH ₃ CH ₂ OH |
| (c) | (CH ₃ COO) ₂ Ca | CH ₃ CH ₂ OMgBr | CH ₃ -CH-CH ₃

OH |
| (d) | CH ₃ COCH ₃ | (CH ₃) ₃ COMgBr | CH ₃ -CHCH ₃

OH |
- Q.27 If sodium metal crystallises as a body centered cubic lattice with the cell edge 4.29 Å, then the radius of sodium atom is x × 10⁸ cm. The value of x is
- (a) 1.857 (b) 2.371 (c) 3.817 (d) 9.312
- Q.28 Which of the following is the correct order of boiling point of hydrides of group 15 elements?
- (a) SbH₃ > NH₃ > AsH₃ > PH₃ (b) SbH₃ > NH₃ > PH₃ > AsH₃
 (c) NH₃ > PH₃ > AsH₃ > SbH₃ (d) NH₃ > PH₃ > SbH₃ > AsH₃

- Q.29 Choose the incorrect statement.
- Glucose is aldohexose
 - Naturally occurring glucose is dextrorotatory
 - Glucose contains three chiral centres
 - Glucose contains one primary alcoholic group and four secondary alcoholic groups.

Q.30 $\text{HOH}_2\text{C} \cdot \text{CH}_2\text{OH}$ on heating with periodic acid gives

- (a) $2 \begin{array}{c} \text{H} \\ \diagup \\ \text{C} = \text{O} \\ \diagdown \\ \text{H} \end{array}$ (b) 2CO_2 (c) 2HCOOH (d) $\begin{array}{c} \text{CHO} \\ | \\ \text{CHO} \end{array}$

Q.31 Which of the following statement is correct regarding relative lowering of vapour pressure?

- It is proportional to the ratio of number of solvent molecules to solute molecules
- It is proportional to the ratio solute molecules to solvent molecules
- It is proportional to ratio solvent molecules to the total number of molecules in solution
- It is proportional to the ratio of solute molecules to the total number of molecules in solution

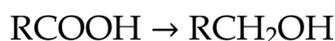
Q.32 Which of the following statements is incorrect regarding covalent solids?

- Covalent solids are also called gaint molecule
- Diamond and silicon carbide belong to this class of solid
- They have extremely high melting point
- These are very soft and brittle

Q.33 Which of the most stable hydride?

- (a) AsH_3 (b) SbH_3 (c) PH_3 (d) NH_3

Q.34 For the reaction,



the reagent used is

- (a) NaBH_4 (b) $\text{Na}/\text{alcohol}$
 (c) $\text{Zn}/\text{Hg} - \text{HCL}$ (d) $\text{LiAlH}_4/\text{alcohol}$

Q.35 A 10% solution (by mass) of sucrose in water has a freezing point of 269.15 K. Calculate the freezing point of 10% glucose in water if the freezing point of water is 273.15 K [Molar mass of sucrose = 342 g mol^{-1} and molar mass of glucose = 180 g mol^{-1}]

- (a) 265.55 K (b) 273.15 K (c) 280,75 K (d) 286.75 K

Q.36 In which of the following, sulphur is present in +6 oxidation state?

- I. Sulphurous acid II. Dithionic acid
 III. Sulphuric acid IV. Disulphuric acid

Choose the correct option.

- (a) I and II (b) III and IV (c) I and IV (d) Only 1

Q.37 The name of the given dipeptide is

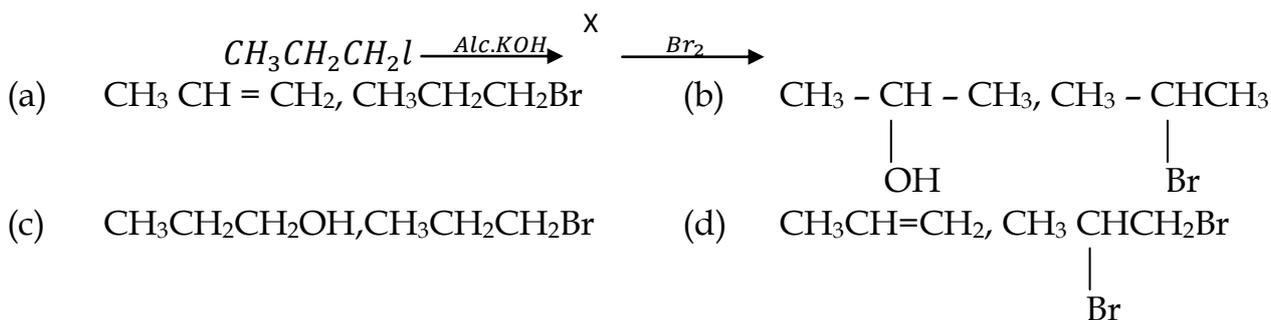


- (a) Glycyl glycine (b) Glycylalanine
 (c) Glycine alanine (d) Alanyl glycine

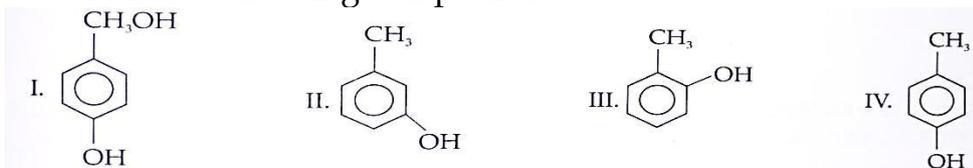
Q.38 On heating ammonium dichromate (I) and barium azide (II) separately, we get

- (a) N_2O in I case and NO_2 in second case
(b) N_2O in I case and N_2 in second case
(c) N_2 in both cases (d) N_2 in I case and NO in second case

Q.39 Look at the reaction given below:



Q.40 Consider the following compounds:



The compound(s) that gives tribromoderivatives on treatment with bromine water is

- (a) Only II (b) I and II (c) III and IV (d) Only I
- Q.41 Major product obtained when chlorobenzene react with ammonia in presence of cuprous oxide?

- (a) Aniline (b) Benzoic acid (c) Phenol (d) Benzoic acid
- Q.42 The mole fraction of ethanol in a sample of spirit containing 80 % ethanol by mass

(a) 0.609 (b) 0.96 (c) 0.82 (d) 0.85

Q.43 Which of the following statement is correct about sulphur?

- (a) Sulphur forms only two types of allotropes
(b) Rhombic and monoclinic sulphur are the type of allotropic sulphur
(c) The stable form of sulphur at room temperature is monoclinic sulphur
(d) All of the above statements are correct

Q.44 Select the correct statement.

- (a) Melting point of quartz glass is sharp but of quartz is not
(b) Salt has long range order of constituents but ice does not
(c) Heat of fusion is definite for iron but not for rubber
(d) Glass can give two pieces with plain and smooth surfaces when cut with a sharp edged tool

Direction (Q. Nos. 45-49) For given questions two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

- (a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true, but R is not the correct explanation of A
(c) A is true, but R is false
(d) A is false, but R is true

Q.45 **Assertion** Alcohol and phenol can be distinguished by sodium hydroxide.

Reason Alcohol is more acidic than phenol.

Q.46 **Assertion** The close packing of atoms in cubic structure is in the order fcc > bcc > sc

Reason The formula used for packing density is $\frac{\text{volume of unit cell } a^3}{a^3}$

Q.47 **Assertion** Isotonic solution show the phenomenon of osmosis.

Reason Isotonic solution have equal osmotic pressure.

- Q.48 **Assertion** Ammonia is used in detection of Cu^{2+} ion.
Reason Ammonia reacts with Cu^{2+} ion to give blue precipitate of CuO .
- Q.49 **Assertion** Leucine is an essential amino acid.
Reason The amino acids which the body cannot synthesis are called essential amino acid

SECTION - C

This section consists of 6 multiple choice questions with an overall choice to attempt any 5. In case more than desirable number of questions are attempted. ONLY first 5 will be considered for evaluation.

- Q.50 Which of the following analogies is correct?
 (a) Acidic strength: $\text{HF} < \text{HCl} < \text{HBr} < \text{HI}$:: Stability: $\text{HF} > \text{HCl} > \text{HBr} > \text{HI}$
 (b) Thiosulphuric acid : $\text{H}_2\text{S}_3\text{O}_7$:: Caro's acid: $\text{H}_2\text{S}_2\text{O}_3$
 (c) SO_3 Planar triangular: : H_2SO_4 : V-shaped
 (d) Oxidation state of N in N_3H : $-\frac{1}{3}$: Oxidation state of N in NH_3 : +3
- Q.51 Complete the following analogy. An equal number of cations and anions are missing from the lattice: A:: The smaller cation is dislocated from its normal position to an interstitial site: B.
 (a) A: Schottky:: B: Vacancy defect (b) A: Schottky:: B: Frenkel
 (c) A: Frenkel:: B: Vacancy defect (d) A: Frenkel:: B: Interstitial defect
- Q.52 Match the item given in Column I with the item given in Column II and mark the correct codes that are given below.

Column I	Column II
A. CH_3CHCl_2	1. Allyl halide
B. $\text{CH}_2\text{ClCH}_2\text{Cl}$	2. Vinyl halide
C. $\text{CHCl} = \text{CH}_2$	3. Alkylidene halide
D. $\text{ClCH}_2 - \text{CH} = \text{CH}_2$	4. Alkylendihalide

Codes

	A	B	C	D		A	B	C	D
(a)	3	4	2	1	(b)	2	1	3	4
(c)	1	3	2	4	(d)	4	1	3	2

Case Read the passage given below and answer the following questions (53 - 55)

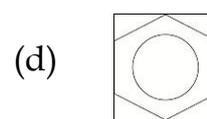
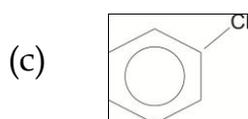
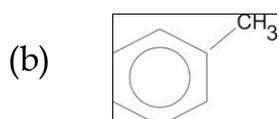
Phenol, which is also called carbolic acid, is an aromatic organic compound with the molecular form $\text{C}_6\text{H}_5\text{OH}$. In this, the -OH group is directly attached to sp^2 -hybridised carbon of an aromatic ring.

The carbon-oxygen bond length (136 pm) in phenol is slightly less than that in methanol. This is due to the partial double bond character on account of the conjugation of unshared electron pair of oxygen with the aromatic ring and sp^3 -hybridised state of carbon to which oxygen is attached.

Phenol can be prepared by various means or methods. Some important methods are alkali fusion of sulphonates, hydrolysis of diazonium salts, decarboxylation of salicylic acid and from Grignard reagent. Commercially, it is prepared from Dow's process and from cumene. In Dow's process, phenol is obtained when chlorobenzene is heated with 6-8% NaOH at 623 K under 320 atm pressure. Aerial oxidation of cumene produces cumenehydroperoxide which upon subsequent hydrolysis with an aqueous acid gives phenol and propanone.

Benzene is sulphonated with oleum and benzene sulphonic acid so formed is converted to sodium phenoxide on heating with molten sodium hydroxide. Acidification of the sodium salt gives phenol.

- Q.53 What is the role of Grignard reagent?
- (a) Form new carbon-carbon bonds
 - (b) Remove carbon-carbon bond
 - (c) Form new carbon-oxygen bond
 - (d) Remove carbon-carbon double bond
- Q.54 Which of the following major product is formed when phenol is treated with sodium hydroxide and carbon dioxide?
- (a) Salicylic acid
 - (b) Phthalic acid
 - (c) Salicylaldehyde
 - (d) Benzoic acid
- Q.55 Among the given compounds, one which most easily attacked by an electrophile is.....

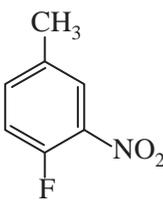


Class XII
Chemistry
Answer Key
Set-4
Term 1

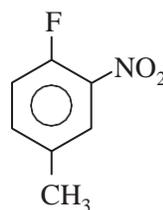
SECTION A		SECTION B		SECTION C	
Question No.	Correct option	Question No.	Correct option	Question No.	Correct option
1.	A	26.	A	50.	A
2.	D	27.	A	51.	B
3.	A	28.	A	52.	A
4.	B	29.	C	53.	A
5.	C	30.	A	54.	A
6.	A	31.	D	55.	A
7.	D	32.	D		
8.	D	33.	D		
9.	C	34.	D		
10.	A	35.	A		
11.	A	36.	B		
12.	A	37.	D		
13.	C	38.	C		
14.	C	39.	D		
15.	D	40.	A		
16.	D	41.	A		
17.	A	42.	A		
18.	B	43.	B		
19.	A	44.	C		
20.	B	45.	C		
21.	B	46.	A		
22.	B	47.	D		
23.	B	48.	C		
24.	A	49.	A		
25.	B				

- (c) treatment with pyridinium (d) treatment with KMnO_4
- 8.** Which of the following is the wrong statement?
- (a) Ozone is diamagnetic gas (b) O_2 is paramagnetic
(c) O_3 molecule is bent (d) O – O bond lengths in ozone are unequal
- 9.** The compound that reacts fastest with Lucas reagent at room temperature is
- (a) butan 1 – ol (b) butan 2 – ol
(c) 2-methylpropan 1-ol (d) 2-methylpropan 2 – ol

10. Which one of the following is non-crystalline or amorphous?
 (a) Diamond (b) Graphite (c) Glass (d) Common Salt
11. Which of the following ethers is not cleaved by HI?
 (a) Dicyclohexyl ether (b) Phenetol
 (c) Di-tert-butyl ether (d) Diphenyl ether
12. The system that forms maximum boiling azeotrope is:
 (a) ethyl alcohol and water (b) benzene and toluene
 (c) acetone and chloroform (d) CS₂ and acetone
13. Phenol when first treated with concentrated sulphuric acid and then with concentrated nitric acid, gives
 (a) nitrobenzene (b) 2,4,6-trinitrophenol (c) *o*-nitrophenol (d) *p*-nitrophenol
14. Which of the following compounds does not exist?
 (a) NCl₅ (b) AsF₅ (c) SbCl₅ (d) PF₅
15. Which part of the nucleotide is responsible for the formation of bonds in DNA double helix?
 (a) Base (b) Sugar
 (c) Phosphate group (d) Hydroxyl group of sugar

16. The IUPAC name of given compound  is

- (a) 4-fluoro-1-methyl-3nitrobenzene
 (b) 1-fluoro-4-methyl-2-nitrobenzene
 (c) 2-fluoro-5-methyl-1-nitrobenzene
 (d) 4-methyl-1-fluoro-2-nitrobenzene



17. Which of the following has the highest boiling point ?
 (a) CH₃F (b) CH₃Cl (c) CH₃Br (d) CH₃I
18. XeF₂ is isostructural with
 (a) TeF₄ (b) ICl₂⁻ (c) SbCl₃ (d) BaCl₂
19. The solubility of a gas in water depends upon
 (a) Nature of the gas (b) Temperature
 (c) Pressure of the gas (d) All of the above.
20. Which one of the following orders is correct for the bond dissociation enthalpy of halogen molecules?
 (a) Cl₂ > Br₂ > F₂ > I₂ (b) Br₂ > I₂ > F₂ > Cl₂
 (c) F₂ > Cl₂ > Br₂ > I₂ (d) I₂ > Br₂ > Cl₂ > F₂
21. Each polypeptide in a protein has amino acids linked with each other in a specific sequence. This sequence of amino acids is said to be
 (a) primary structure of proteins (b) secondary structure of proteins
 (c) tertiary structure of proteins (d) quaternary structure of proteins
22. Sulphur dioxide gas does not act as
 (a) oxidising agent (b) reducing agent
 (c) dehydrating agent (d) bleaching agent

23. The reaction which involves dichlorocarbene as an electrophile is
 (a) Reimer–Tiemann reaction (b) Kolbe’s reaction
 (c) Friedel–Craft’s acylation (d) Fittig’s reaction
24. Which one of the following is least basic?
 (a) NCl_3 (b) NBr_3 (c) NI_3 (d) NF_3
25. If molality of the dilute solution is doubled, the value of molal depression constant (K_f) will be
 (a) doubled (b) halved (c) tripled (d) unchanged

SECTION - B

This section consists of 24 multiple choice questions with overall choice to attempt **any 20** questions. In case more than desirable number of questions are attempted, ONLY first 20 will be considered for evaluation.

26. Which of the following statements about the composition of the vapour over an ideal 1:1 molar mixture of benzene and toluene is correct? Assume that the temperature is constant at 25°C . (Given, vapour pressure data at 25°C , benzene = 12.8 kPa, toluene = 3.85 kPa)
 (a) The vapour will contain a higher percentage of toluene
 (b) The vapour will contain equal amounts of benzene and toluene
 (c) Not enough information is given to make a prediction
 (d) The vapour will contain a higher percentage of benzene
27. Which of the following compounds can yield only one monochlorinated product upon free radical chlorination?
 (a) 2, 2-Dimethylpropane (b) 2-Methylpropane
 (c) 2-Methylbutane (d) n-Butane
28. The correct increasing order of ionic radii is
 (a) $\text{Po} < \text{Se} < \text{Te} < \text{S} < \text{O}$ (b) $\text{O} < \text{S} < \text{Se} < \text{Te} < \text{Po}$
 (c) $\text{S} < \text{O} < \text{Te} < \text{Se} < \text{Po}$ (d) none of these
29. RNA on hydrolysis does not yield which of the following?
 (a) Amino acid (b) Pentose sugar (c) Nitrogen base (d) Phosphoric acid
30. Which of the following alcohols will give the most stable carbocation during dehydration?
 (a) 2-methyl-1-propanol (b) 2-methyl-2-propanol
 (c) 1-Butanol (d) 2-Butanol
31. Which of the following is used in the preparation of chlorine using HCl?
 (a) Only MnO_2 (b) Only KMnO_4
 (c) Both MnO_2 and KMnO_4 (d) None of these
32. The density of a metal which crystallises in bcc lattice with unit cell edge length 300 pm and molar mass 50 g mol^{-1} will be
 (a) 10 g cm^{-3} (b) 14.2 g cm^{-3} (c) 6.15 g cm^{-3} (d) 9.32 g cm^{-3}
33. The reaction of toluene with chlorine in presence of FeCl_3 gives predominantly.
 (a) a mixture of *o*- and *p*-chlorotoluene (b) benzyl chloride
 (c) *m*-chlorotoluene (d) benzoyl chloride
34. The formation of $\text{O}_2^+ [\text{PtF}_6]^-$ is the basis for the formation of compound of xenon fluorides. This is because
 (a) O_2 and Xe have comparable electro negativities
 (b) O_2 and Xe have comparable ionization energies
 (c) both O_2 and Xe are gases
 (d) O_2 and Xe are comparable gases

so315u.tioAn of acetone in ethanol

- (a) shows a negative deviation from Raoult's law
 - (b) shows a positive deviation from Raoult's law
 - (c) behaves like a near ideal solution
 - (d) obeys Raoult's law
36. The attachment between the base and sugar in a nucleotide is through _____ bond.
- (a) hydrogen
 - (b) peptide
 - (c) phosphodiester
 - (d) glycosidic
37. Among the following, the correct order of acidity is
- (a) $\text{HClO} < \text{HClO}_2 < \text{HClO}_3 < \text{HClO}_4$
 - (b) $\text{HClO}_2 < \text{HClO} < \text{HClO}_3 < \text{HClO}_4$
 - (c) $\text{HClO}_4 < \text{HClO}_2 < \text{HClO} < \text{HClO}_3$
 - (d) $\text{HClO}_3 < \text{HClO}_2 < \text{HClO} < \text{HClO}_4$
38. Alkali halides do not show Frenkel defect because
- (a) cations and anions have almost equal size
 - (b) there is a large difference in size of cations and anions
 - (c) cations and anions have low coordination number
 - (d) anions cannot be accommodated in voids
39. Pure nitrogen is prepared in the laboratory by heating a mixture of
- (a) $\text{NH}_4\text{OH} + \text{NaCl}$
 - (b) $\text{NH}_4\text{NO}_3 + \text{NaCl}$
 - (c) $\text{NH}_4\text{Cl} + \text{NaOH}$
 - (d) $\text{NH}_4\text{Cl} + \text{NaNO}_2$
40. Compound X with the molecular formula $\text{C}_3\text{H}_8\text{O}$ can be oxidised to another compound Y whose molecular formulae is $\text{C}_3\text{H}_6\text{O}_2$. The compound X may be
- (a) $\text{CH}_3\text{CH}_2\text{OCH}_3$
 - (b) $\text{CH}_3\text{CH}_2\text{CHO}$
 - (c) $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$
 - (d) $\text{CH}_3\text{CHOHCH}_3$
41. Butane nitrile can be prepared by heating.
- (a) propyl alcohol with KCN
 - (b) butyl chloride with KCN
 - (c) butyl alcohol with KCN
 - (d) propyl chloride with KCN
42. Which one of the following arrangements represents the correct order of electron gain enthalpy (with negative sign) of the given atomic species?
- (a) $\text{Cl} < \text{F} < \text{S} < \text{O}$
 - (b) $\text{O} < \text{S} < \text{F} < \text{Cl}$
 - (c) $\text{S} < \text{O} < \text{Cl} < \text{F}$
 - (d) $\text{F} < \text{Cl} < \text{O} < \text{S}$
43. What would be the reactant and reagent used to obtain 2, 4-dimethylpentan-3-ol?
- (a) Propanal and propyl magnesium bromide
 - (b) 3-methylbutanal and 2-methyl magnesium iodide
 - (c) 2-dimethyl propanoate and methyl magnesium iodide
 - (d) 2-methylpropanal and isopropyl magnesium iodide
44. Methyl bromide reacts with AgF to give methyl fluoride and silver bromide. This reaction is called
- (a) Fittig reaction
 - (b) Swarts reaction
 - (c) Wurtz reaction
 - (d) Finkelstein reaction
45. **Assertion (A)** : HClO is a stronger acid than HBrO .
- reason (r)** : Greater is the electronegativity of the halogen, greater it will attract the electron pair towards it and hence more easily the H^+ ion will be released.
46. **Assertion (A)** : Aryl iodides can be prepared by reaction of arenes with iodine in the presence of an oxidising agent.
- reason (r)** : Oxidising agent oxidises I_2 into HI .
47. **Assertion (A)**: Larger the value of cryoscopic constant of the solvent, lesser will be the freezing point of the solution.
- reason (r)** : Depression in the freezing point depends on the nature of the solvent.
48. **Assertion (A)** : Bond angle of H_2S is smaller than H_2O .
- reason (r)** : Electronegativity of the central atom increases, bond angle decreases.
49. **Assertion (A)**: Aquatic species are more comfortable in cold waters rather than in warm waters.
- reason (r)** : Different gases have different K_{H} values at the same temperature.

SECTION - C

This section consists of 6 multiple choice questions with an overall choice to attempt **any 5**. In case more than desirable number of questions are attempted, ONLY first 5 will be considered for evaluation.

50. Match the items in column I with column II and choose the correct answer.

column i (Biomolecules)	column ii (example)
(1) Carbohydrates	(i) Keratin
(2) Fibrous Protein	(ii) Maltose
(3) Nucleic acid	(iii) Insulin
(4) Globula Protein	(iv) DNA

Which of the following is the best matched options?

- (a) (1)–(iv), (2)–(ii), (3)–(iii), (4)–(i) (b) (1)–(iii), (2)–(i), (3)–(iv), (4)–(ii)
 (c) (1)–(ii), (2)–(i), (3)–(iv), (4)–(iii) (d) (1)–(ii), (2)–(iii), (3)–(iv), (4)–(i)

51. Which of the following analogies is correct?

- (a) N_2 : gas :: P_4 :solid (b) HNO_2 : stable :: HNO_3 :unstable
 (c) Bi_2O_3 : acidic :: N_2O_5 : amphoteric (d) ON of N in NH_3 : -4 :: ON of N in N_2 :1

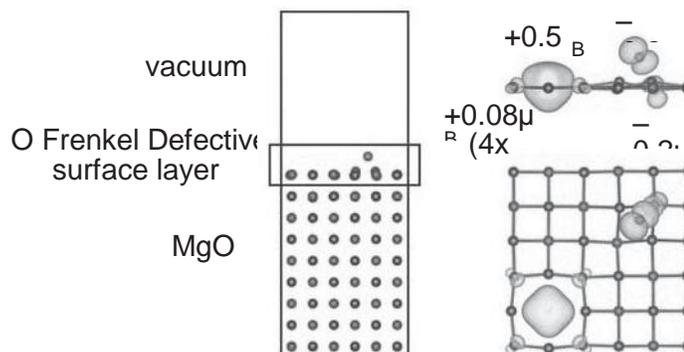
52. Complete the following analogy

CH_3Br : Alkyl halide ::----- : allyl halide

- (a) $CH_2 = CHX$ (b) $CH_2 = CH - CH_2X$ (c) C_6H_5X (d) CH_3CH_2X

cAse : read the passage given below and answer the following questions

Recent experimental and simulation studies on the hydration of MgO suggest that physically and chemically induced surface defects strongly promote the reaction. The result of density functional theory calculations on the stability and the structural and electronic properties of Frenkel and Schottky defects at the $MgO\{100\}$ surface performed in light of the surface chemistry of MgO are presented here. Comparison of calculated formation energies shows that Frenkel and Schottky defects are more likely to be formed at the surface than in the bulk. Frenkel adatoms were found to induce a strong local restructuring of surface atoms. The lowest energy configurations include spin-polarized and dumbbell-type reconstructions for Mg and O Frenkel adatoms. O Frenkel Vacancies were observed to trap significant amounts of electronic charge. Analysis of the electronic density of states reveals that surface Frenkel defects introduce many electronic defect states in the wide band gap of perfect MgO. These findings are a strong indication that the defective MgO surface is not chemically inert and will more easily bind or dissociate molecules and ions.



Source: The Journal of Physical Chemistry.

53. MgO shows

- (a) Frenkel defect (b) Schottky defect (c) Both (a) and (b) (d) None of these

54. The density of crystal changes in

- (a) Frenkel defect (b) Schottky defect (c) Both (a) and (b) (d) None of these

55. Ionic Solids with Schottky defect contain _____ in their structure

- (a) equal number cation and anion vacancies (b) interstitial anions and anionic vacancies
 (c) cation vacancies only (d) cation vacancies and interstitial cations

Answer Key Set-5 Term 1 Chemistry

SECTION - A

1. (d) 2. (d) 3. (b) 4. (c) 5. (c)
6. (c) It is present in pyranose structure.
7. (d) 8. (d) 9. (d) 10. (c) 11. (d) 12. (c) 13. (b) 14. (a) 15. (a) 16. (b)
17. (d) 18. (b) 19. (d) 20. (a) 21. (a) 22. (c) 23. (a) 24. (d) 25. (d)

SECTION - B

26. (d) 27. (a) 28. (b) 29. (a) 30. (b) 31. (c) 32. (c) 33. (a) 34. (b) 35. (b)
36. (d) 37. (a) 38. (a) 39. (d) 40. (c) 41. (d) 42. (b) 43. (d) 44. (b) 45. (a)
46. (c) 47. (a) 48. (c) 49. (b)

SECTION - C

50. (c) 51. (a) 52. (b) 53. (c) 54. (b) 55. (a)