مـــدرسـة دلهـــي الخـاصـة ذ.م.م.
DELHI PRIVATE SCHOOL L.L.C.
Affiliated to C.B.S.E., DELHI
(Approved & Recognized By Ministry of Education - United Arab Emirates)
DPS SHARJAH

PB-T1/CHQP/1221/B **10-NOV-2021**

PRE BOARD EXAMINATION (2021-22)
TERM I – SET B

SUBJECT: CHEMISTRY **MAX. MARKS:35**
GRADE: XII **TIME:90 MINS**
Name: **Section:** **Roll No:**

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. Pure nitrogen is prepared in the laboratory by heating a mixture of

a. $NH_4OH + NaCl$ **b.** $NH_4NO_3 + NaCl$
c. $NH_4Cl + NaOH$ **d.** $NH_4Cl + NaNO_2$

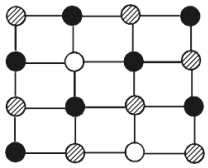
2. In a solid ABAB having the NaCl structure, A atom occupy the corners and each of the cubic unit cell then B atoms always present at the centre of edge and one B atom present at the body centre in NaCl structure. If all the face centred atoms along one of the axes are removed, then the resultant stoichiometry of the solid is

a. AB_2 b. A_2B
c. A_4B_3 d. A_3B_4

3. p_A and p_B are the vapour pressures of pure liquid components, A and B, respectively of an ideal binary solution. If x_A represents the mole fraction of component A, the total pressure of the solution will be

a. $p_A + x_A(p_B - p_A)$ **b.** $p_A + x_A (p_A - p_B)$
c. $p_B + x_A(p_B - p_A)$ **d.** $p_B + x_A (p_A - p_B)$

4.



Cation ●
Anion ▨

The given structure represents___

a. Schottky defect **b.** Frenkel defect
c. Metal excess **d.** Metal deficiency

5. Toluene reacts with a halogen in the presence of iron (III) chloride giving ortho and para halo compounds. The reaction is

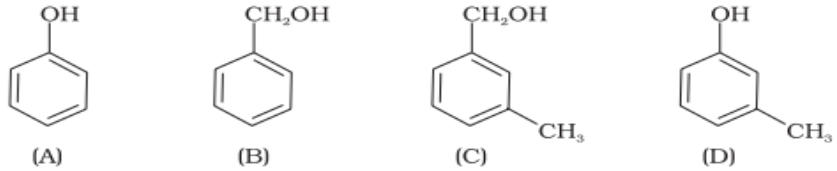
a. Electrophilic elimination reaction
b. Electrophilic substitution reaction
c. Free radical addition reaction
d. Nucleophilic substitution reaction

6. A nucleoside on hydrolysis gives:
a. an aldopentose and a heterocyclic base
b. an aldopentose and orthophosphoric acid
c. a heterocyclic base and orthophosphoric acid
d. an aldopentose, a heterocyclic base and orthophosphoric acid

7. Monochlorination of toluene in sunlight followed by hydrolysis with aq. NaOH yields.
a. o-Cresol
b. m-Cresol
c. 2, 4-Dihydroxytoluene
d. Benzyl alcohol

8. With respect to protonic acids, which of the following statements is correct ?
a. PH_3 is more basic than NH_3
b. PH_3 is less basic than NH_3
c. PH_3 is equally basic as NH_3
d. PH_3 is amphoteric while NH_3 is basic.

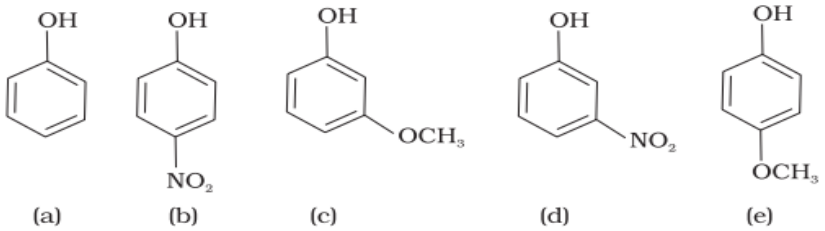
9. Which of the following compounds is aromatic alcohol?



a. A, B, C, D
b. A, D
c. B , C
d. A

10. A solid X melts slightly above 273 K and is a poor conductor of heat and electricity. To which of the following categories does it belong?
a. Ionic solid
b. Covalent solid
c. Metallic solid
d. Molecular solid

11. Mark the correct order of decreasing acid strength of the following compounds



a. e > d > b > a > c
b. b > d > a > c > e
c. d > e > c > b > a
d. e > d > c > b > a

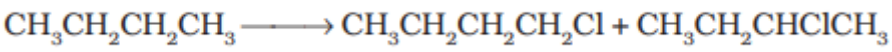
12. The unit of ebulioscopic constant is _____.
a. K kg mol^{-1} or K $(molality)^{-1}$
b. mol kg K^{-1} or K^{-1}(molality)
c. kg mol^{-1} K^{-1} or $K^{-1}(molality)^{-1}$
d. K mol kg^{-1} or K (molality)

13. . Which of the following are used to convert RCHO into RCH_2OH?
a. HNO_3
b. $LiAlH_4$
c. $KMnO_4$
d. Reaction with RMgX followed by hydrolysis

14. Bleaching action of SO2 is due to
a. reduction
b. oxidation
c. hydrolysis
d. its acidic nature

15. In DNA, the consecutive deoxynucleotides are connected via
a. phospho diester linkage
b. phospho monoester linkage
c. phospho triester linkage
d. amide linkage

16. Which reagent will you use for the following reaction?



a. Cl_2/UV light
b. $NaCl + H_2SO_4$
c. Cl_2 gas in dark
d. Cl_2 gas in the presence of iron in dark

17. Arrange the following compounds in increasing order of their boiling points.

a. b) < (a) < (c)
b. (a) < (b) < (c)
c. (c) < (a) < (b)
d. (c) < (b) < (a)

18. The correct order of acidic strength is
a. HF < HCl < HBr < HI
b. HBr < HCl < HI < HF
c. HCl < HBr < HF < HI
d. HI < HBr < HCl < HF

19. K_H value for Ar(g), CO_2(g), HCHO (g) and CH_4(g) are 40.39, 1.67, 1.83×10^{-5} and 0.413 respectively.
Arrange these gases in the order of their increasing solubility.
a. HCHO < CH_4 < CO_2 < Ar
b. HCHO < CO_2 < CH_4 < Ar
c. Ar < CO_2 < CH_4 < HCHO
d. Ar < CH_4 < CO_2 < HCHO

20. Which one of the following orders is not in accordance with the property stated against is ?
a. HI > HBr > HCl > HF : Acidic property in water
b. $F_2 > Cl_2 > Br_2 > I_2$: Electronegativity
c. $F_2 > Cl_2 > Br_2 > I_2$: Bond dissociation energy
d. $F_2 > Cl_2 > Br_2 > I_2$: Oxidising power

21. The term anomers of glucose refers to
a. isomers of glucose that differ in configurations at carbons one and four (C-1 and C-4)
b. a mixture of (D)-glucose and (L)-glucose
c. enantiomers of glucose
d. isomers of glucose that differ in configuration at carbon one (C-1)

22. The structure of XeF6 is
a. distorted octahedral
b. pyramidal
c. tetrahedral
d. None of these

23. Which of the following reagents can be used to oxidise primary alcohols to aldehydes?
a. $KMnO_4$ in acidic medium
b. CrO_3-H_2SO_4
c. Conc. HNO_3
d. Pyridinium chlorochromate.

24. The basic character of hydrides of the group 15 elements decreases in the order
a. $SbH_3 > PH_3 > AsH_3 > NH_3$
b. $NH_3 > SbH_3 > PH_3 > AsH_3$
c. $NH_3 > PH_3 > AsH_3 > SbH_3$
d. $SbH_3 > AsH_3 > PH_3 > NH_3$

25. The mole fraction of the solute in one molal aqueous solution is
a. 0.009
b. 0.018
c. 0.027
d. 0.036

SECTION -B

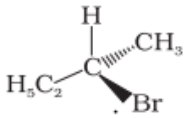
This section consists of 24multiple choice questions with overall choice to attempt any 20 questions. In case more than desirable number of questions are attempted, ONLY first 20 will be considered for evaluation.

26. A 0.5 molal solution of ethylene glycol in water used as coolant in a car. If the freezing point constant of water be 1.86ºC per mole, the mixture shall freeze at

a. 0.93ºC **b.** – 0.93ºC

c. 1.86ºC **d.** – 1.86ºC

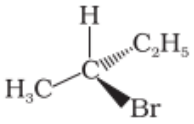
27. Which of the following structures is enantiomeric with the molecule (A) given below :



(A)

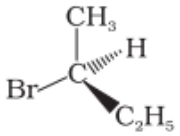
a.

(i)



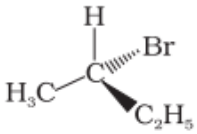
b.

(ii)



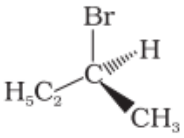
c.

(iii)



d.

(iv)



28. Which of the following has highest dipole moment?

a. NH_3 **b.** PH_3

c. AsH_3 **d.** SbH_3

29. When glucose treated with conc. HNO3 we are obtaining

a. Cyanohydrin **b.** Gluconic acid

c. Glucaric acid **d.** n-Hexane

30. Catalysed hydration of alkenes except ethene leads to the formation of

a. mixture of secondary and tertiary alcohols **b.** mixture of primary and secondary alcohols

c. secondary or tertiary alcohol **d.** Primary alcohol

31. Which of the following has highest electron gain enthalpy?

a. nitrogen **b.** oxygen

c. Sulphur **d.** magnesium

32. For the various types of interactions, the CORRECT order of increasing strength is:

a. covalent < hydrogen bonding < van der Waal's < dipole-dipole

b. van der Waal's < hydrogen bonding < dipole-dipole < covalent

c. van der Waal's < dipole-dipole < hydrogen bonding < covalent

d. dipole-dipole < van der Waal's < hydrogen bonding < covalent

33. The compound A on treatment with Na gives B, and with PCl5 gives C. B and C react together to give diethyl ether. A, B and C are in the order

a. C_2H_5OH, C_2H_6, C_2H_5Cl **b.** C_2H5OH, C_2H_5Cl, C_2H_5ONa

c. C_2H_5Cl, C_2H_6, C_2H_5OH **d.** C_2H_5OH, C_2H_5ONa, C_2H_5Cl

34. An element (X) forms compounds of the formula XCl_3, X_2O_5 and Ca_3X_2 but does not form XCl_5. Which of the following is the element X?

a. B **b.** Al

c. N **d.** P

35. An organic compound A(C4H9Cl) on reaction with Na/diethyl ether gives a hydrocarbon which on monochlorination gives only one chloro derivative then, A is:

a. iso-butyl chloride **b.** secondary butyl chloride

c. t-butyl chloride **d.** n-butyl chloride

36. Which of the following proteins is globular

a. Collagen **b.** Albumin

c. Myosin **d.** Fibroin

37. Which of the following is incorrect ?

a. O_2 is weaker oxidant than O_3 **b.** O_2 has larger bond length than O_3

c. Both O_2 and O_3 are paramagnetic **d.** O_2 is linear and O_3 is angular in shape

38. If the coordination number of Ca^{2+} in CaF_2 is 8, then the coordination number of F^- ion would be_.

a. 3 **b.** 4

c. 8 **d.** 6

39. Element from group 15 form only metallic bond in elemental state

a. P **b.** As and P both

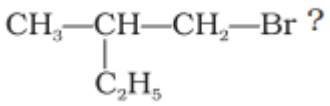
c. As and Bi both **d.** Only Bi

40. An oxygen containing organic compound upon oxidation forms a carboxylic acid as the only organic product with its molecular mass higher by 14 units. The organic compound is

a. Ketone **b.** An aldehyde

c. A primary alcohol **d.** A secondary alcohol

41. Which is the correct IUPAC name for



a. 1-Bromo-2-ethylpropane **b.** 1-Bromo-2-ethyl-2-methylethane

c. 1-Bromo-2-methylbutane **d.** 2-Methyl-1-bromobutane

42. Which of the following statements is true

a. Ammonia is the weakest reducing agent and the strongest base among Group 15 hydrides. **b.** Ammonia is the strongest reducing agent and the strongest base among Group 15 hydrides.

c. Ammonia is the weakest reducing agent as well as the weakest base among Group 15 hydrides. **d.** Ammonia is the strongest reducing agent and the weakest base among Group 15 hydrides.

43. From amongst the following alcohols the one that would react fastest with conc. HCl and anhydrous $ZnCl_2$, is

a. 2-Methylpropan-2-ol **b.** Butan-2-ol

c. Butan-1-ol **d.** 2-Methylpropanol

44. Molecules whose mirror image is non superimposable over them are known as chiral. Which of the following molecules is chiral in nature?

a. 2-Bromobutane **b.** 1-Bromobutane

c. 2-Bromopropane **d.** 2-Bromopropan-2-ol

45. Assertion : HNO_3 makes iron passive.
Reason : HNO_3 forms a protective layer of ferric nitrate on the surface of iron

a. Both assertion and reason are correct statements, and reason is the correct explanation of the assertion. **b.** Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.

c. Assertion is correct, but reason is wrong statement. **d.** Assertion is wrong but reason is correct statement.

46. Assertion : It is difficult to replace chlorine by -OH in chlorobenzene in comparison to that in chloroethane.
Reason : C-Cl bond in chlorobenzene has a partial double bond character due to resonance

a. Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.
b. Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.
c. Assertion is correct, but reason is wrong statement.
d. Assertion is wrong but reason is correct statement.

47. Assertion : When a solution is separated from the pure solvent by a semipermeable membrane, the solvent molecules pass through it from pure solvent side to the solution side.
Reason : Diffusion of solvent occurs from a region of high concentration solution to a region of low concentration solution.

a. Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.
b. Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.
c. Assertion is correct, but reason is wrong statement.
d. Assertion is wrong but reason is correct statement.

48. Assertion : Both rhombic and monoclinic sulphur exist as S_8 but oxygen exists as O_2.
Reason : Oxygen forms $p\pi - p\pi$ multiple bond due to small size and small bond length but $p\pi - p\pi$ bonding is not possible in sulphur.

a. Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.
b. Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.
c. Assertion is correct, but reason is wrong statement.
d. Assertion is wrong but reason is correct statement.

49. Assertion : p-nitrophenol is more acidic than phenol.
Reason : Nitro group stabilizes phenoxide ion by dispersal of negative charge due to resonance.

a. Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.
b. Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.
c. Assertion is correct, but reason is wrong statement.
d. Assertion is wrong but reason is correct statement.

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:

(I)	(II)
(i) Fructose	(A) Protein
(ii) Amino acid	(B) Monosaccharide
(iii) Uracil	(C) RNA
(iv) Non-Reducing sugar	(D) Sucrose

Which of the following is the best matched options?

a. i-A, v- B, iii- C, iv-D
b. i-B, v- A, iii- C, iv-D

c. i-D, v- A, iii- C, iv-B **d.** i-A, v- C, iii- D, iv-B

51. Which of the following analogies is correct:

a. XeF_4 , Sp^3d^2, Square planar:: XeF_6, Sp^3d^3, Distorted Octahedral **b.** XeF_2: Linear :: ClF_3: Trigonal planar

c. Helium: meteorological observations:: Argon: metallurgical processes **d.** BiH_3: weakest reducing agent :: NH_3 strongest reducing agent

52. Complete the following analogy

Alkyl halide change to symmetrical alkane in presence of sodium and dry ether: A::

Alkyl halide with haloarenes form alkyl halide in presence of sodium and dry ether: B

a. A: Fittig reaction B: Wurtz reaction **b.** A: Wurtz reaction B: Wurtz-Fittig

c. A: Wurtz-Fittig B: Fittig reaction **d.** A: Wurtz reaction B: Fridel craft alkylation

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

Unit cells can be broadly divided into two categories, primitive and centred unit cells.

(a) Primitive Unit Cells When constituent particles are present only on the corner positions of a unit cell, it is called as primitive unit cell.

(b) Centred Unit Cells When a unit cell contains one or more constituent particles present at positions other than corners in addition to those at corners, it is called a centred unit cell. Centred unit cells are of three types:

(i) Body-Centred Unit Cells: Such a unit cell contains one constituent particle (atom, molecule or ion) at its body-centre besides the ones that are at its corners.

(ii) Face-Centred Unit Cells: Such a unit cell contains one constituent particle present at the centre of each face, besides the ones that are at its corners.

(iii) End-Centred Unit Cells: In such a unit cell, one constituent particle is present at the centre of any two opposite faces besides the ones present at its corners.

Closepacking results in either ccp or hcp structure and two types of voids are generated. All octahedral or tetrahedral voids are not occupied. In a given compound, the fraction of octahedral or tetrahedral voids that are occupied, depends upon the chemical formula of the compound

53. A solid is made of two elements P and Q. Atoms P are in ccp arrangements and atoms Q occupy all the octahedral voids and half of the tetrahedral voids. The simplest formula of the compound is__.

a. PQ_2 **b.** P_2Q

c. PQ **d.** P_2Q_3

54. An element crystallizes in a structure having fcc unit cell of an edge 100 pm. Calculate the density if 150 g of the element contains 18×10^{23} atoms.

a. 33.3 g cm^{-3} **b.** 333.3 g cm^{-3}

c. 243.3 g cm^{-3} **d.** 153.3 g cm^{-3}

55. Tetragonal crystal system has the following unit cell dimensions:

a. $a = b = c$ and $\alpha = \beta = \gamma = 90°$ **b.** $a = b \neq c$ and $\alpha = \beta = \gamma = 90°$

c. $a \neq b \neq c$ and $\alpha = \beta = \gamma = 90°$ **d.** $a = b \neq c$ and $\alpha = \beta = 90°$, $\gamma = 120°$

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