CHEMISTRY

BOOKS - NTA MOCK TESTS

NEET MOCK TEST 1

CHEMISTRY - SINGLE CHOICE

1. Setting of plaster of paris is

    A. Dehydration

    B. Oxidation with atmospheric CO_2

    C. Combination with atmospheric CO_2

    D. Hydration to yield another hydrate

Answer: D

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2. At STP, 0.50 mole H_2 gas and 1.0 mole He gas

A. Occupy equal volumes

B. Have equal diffusion rates

C. Have equal molecular speeds

D. Have equal average kinetic energies

Answer: D

3. Suppose $5g$ of acetic acid is dissolved in one litre of ethanol. Assume no reaction in between them. Calculate molality of resulting solution if density of ethanol is $0.789 \dfrac{g}{mL}$.
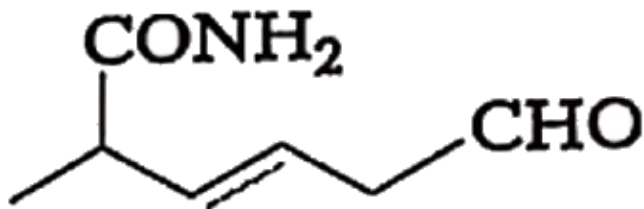
A. 0.1056

B. 0.056

C. 0.156

D. 0.16

Answer: A

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4. The IUPAC name of the following compound is
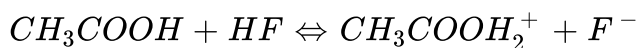

A. 2 Carbamoylhexanal

B. 2- Carbamoylhex - 3 - enal

C. 2 Methyl - 6 oxohex-3 -enamide

D. 6-Keto-2-methyl hexamide

Answer: C

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5. In the equilibrium

$$CH_3COOH + HF \Leftrightarrow CH_3COOH_2^+ + F^-$$

A. F^- is the conjugate acid of CH_3COOH

B. F^- is the conjugate base of HF

C. CH_3COOH is the conjugate acid of $CH_3COOH_2^+$

D. $CH_3COOH_2^+$ is the conjugate base of CH_3COOH

Answer: B

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6. $20mL$ of $0.2M$ $Al_2(SO_4)_3$ mixed with $20mL$ of $0.6M$ $BaCl_2$. Calculate the concentration of each ion in solution.

A. No concentration of Ba^{2+} or SO_4^{2-}

B. $Ba^{2+} = 0.6M$, $SO_4^{2-} = 0.3M$

C. $Ba^{2+} = 0.6M$, $SO_4^{2-} = 0.6M$

D. None of these

Answer: A

7. The ionic radii of N^{3-}, O^{2-} and F^- are respectively given by:

A. 1.71,1.36 and 1.40

B. 1.36 , 1.40 and 1.71

C. 1.36,1.71 and 1.40

D. 1.71, 1.40 and 1.36

Answer: D

8. Total number of isomeric alkene possible with compound having molecular formula C_4H_8 is

A. 2

B. 3

C. 4

D. 5

Answer: C

9. The fermentation of starch to give alcohol occurs mainly with the help of :

A. O_2

B. Air

C. CO_2

D. Enzymes

Answer: D

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10. In compounds of type ECI_3, where $E = BP$, As or B, the angles

$CI - E - CI$ for different E are in the order

A. $B > P = As = Bi$

B. $B < P = As = Bi$

C. $B < P < As < Bi$

D. $B > P > As > Bi$

Answer: D

11. For the reaction , $Cl_2 + 2I^- \rightarrow I_2 + 2Cl^-$, the initial concentration of I^- was 0.20mol lit^{-1} and the concentration after 20 minutes was 0.18mol lit^{-1}. Then the rate of formation of I_2 in mol lit^{-1} min^{-1} would be

A. 1×10^{-4}

B. 5×10^{-4}

C. 1×10^{-3}

D. 5×10^{-3}

Answer: B

12. The half-life of a radio isotope is four hours. If the initial mass of the isotope was 200 g , the un-decayed mass remaining after 24 hours is :

A. 1.042 g

B. 2.084 g

C. 3.125 g

D. 4.167 g

Answer: C

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13. The metal always found in the free state is

A. Iron

B. Gold

C. Aluminium

D. Sodium

Answer: B

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14. 2-Phenylpropene on acidic hydration gives:

A. 2-Phenyl-2-propanol

B. 2-Phenyl-1-propanol

C. 3-Phenyl-1-propanol

D. 1-Phenyl-2-propanol

Answer: A

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15. The total pressure of a mixture of H_2 and O_2 is 1.00 bar. The mixture is allowed to react to form water which is completely removed to leave only pure H_2 at a pressure of 0.35 bar . Assuming ideal behaviour and that all pressure measurements were made under the same conditions of temperature and volume. The mole fraction of H_2 in the original mixture is

A. 0.78

B. 0.28

C. 0.22

D. 0.72

Answer: A

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16. 2,4-Dichlorophenoxyacetic acid is used as

A. Fungicide

B. Insecticide

C. Herbicide

D. Moth repellent

Answer: C

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17. Which is the correct IUPAC name of this compound ?
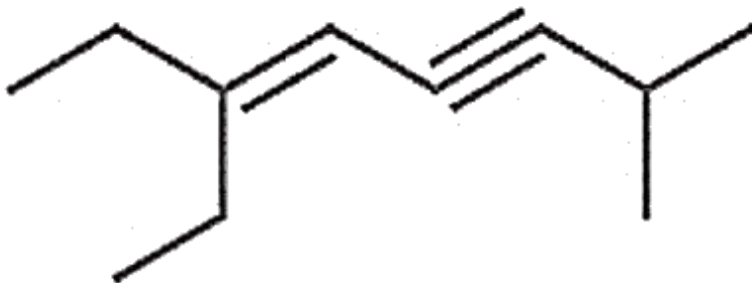
A. 3 - Ethyl-3-pentyl-1 ,4-pentadiene

B. 6-Ethyl-3-(1-methylbutyl) -4,6-octadien -1 -yne

C. 6-Ethyl-2methyl-5-octen-3-yne

D. 3-Ethyl-7-methyl-3- octen-5-yne

Answer: D

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18. The equilibrium constant for the following reaction is 1.6×10^5 at $1024K$

$$H_2(g) + Br_2(g) \Leftrightarrow 2HBr(g)$$
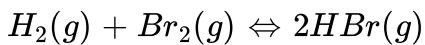
find the equilibrium pressure of all gases if 10.0 bar of HBr is introduced into a sealed container at $1024K$.

A. 10

B. 10.1

C. 9.8

D. 9.9

Answer: A

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19. What is orbital angular momentum of an electron in $3d$ orbital.

A. $\dfrac{\sqrt{3}}{\sqrt{5}} \cdot \dfrac{h}{\pi}$

B. $\dfrac{\sqrt{5}}{\sqrt{4}} \cdot \dfrac{h}{\pi}$

C. $\dfrac{\sqrt{3}}{\sqrt{2}} \cdot \dfrac{h}{\pi}$

D. $\dfrac{h}{\pi}$

Answer: C

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20. Solubility of calcium phosphate (molecular mass, M) in water is $W g$ per $100 mL$ at $25°C$. Its solubility product at $25°C$ will be approximately

A. $10^9 \left(\dfrac{W}{M}\right)^5$

B. $10^7 \left(\dfrac{W}{M}\right)^5$

C. $10^5 \left(\dfrac{W}{M}\right)^5$

D. $10^3 \left(\dfrac{W}{M}\right)^5$

Answer: B

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21. Acetaldehyde cannot exhibit

    A. lodoform test

    B. Lucas test

    C. Benedict's test

    D. Tollen's test

Answer: B

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22. Which of following statements is false ?

    A. Increases of pressure of a gas causes the amount of adsorption to

       increase

    B. Increase of temperature may increase or decrease the amount of

       adsorption

C. The adsorption may be monolayer or multilayer

D. Particle size of the adsorbent does not affect the amount of

adsorption

Answer: D

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23. Equal volumes of two monoatomic gases, A, B, at the same temperature and pressure are mixed. The ratio of specific heats (C_p/C_v) of the mixture will be

A. 1

B. 2

C. 1.67

D. 1.19

Answer: D

24. At $27°C$, one mole of an ideal gas is compressed isothermally and reversibly from a pressure of 2 atm to 10 atm. Calculate ΔU and q.

A. $0, \ -965.84 cal$

B. $0, \ -965.84\text{cal}, \ -865.58\text{cal}$

C. $+865.58\text{cal}, \ -865.58\text{cal}$

D. $0, \ -865.58\text{cal}$

Answer: A

25. The angular momentum of an electron in a Bohr's orbit of He^+ is 3.1652×10^{-34} kg-m^2/sec. What is the wave number in terms of Rydberg constant (R) of the spectral line emitted when an electron falls from this level to the first excited state. [Use h $= 6.626 \times 10^{-34}$ Js]

A. $3R$

B. $\dfrac{5R}{9}$

C. $\dfrac{3R}{4}$

D. $\dfrac{8R}{9}$

Answer: B

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26. In a planar tetra - atomic molecule, XY_3, X is at the centroid of the equilateral triangle formed by the atoms Y. If the X-Y bond distance is 1Å , what is the distance between the centres of any two Y atoms ?

A. $\dfrac{2}{1.155}$Å

B. $\dfrac{2}{0.155}$Å

C. $\dfrac{1.155}{2}$Å

D. $\dfrac{1}{\sqrt{3}}$Å

Answer: A

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27. $2Zn + O_2 \rightarrow 2ZnO,$ $\Delta G° = -606J \ldots (i)$

$2Zn + 2S \rightarrow 2ZnS,$ $\Delta G° = -293J \ldots (ii)$

$2S + 2O_2 \rightarrow 2SO_2(g),$ $\Delta G° = -408J \ldots (iii)$
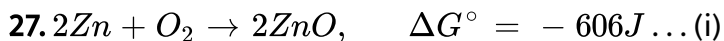
$\Delta G°$ for the following reaction

$2ZnS + 3O_2 \rightarrow 2ZnO + 2SO_2$
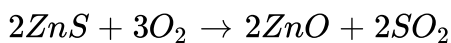
would be:

A. $-357kJ$

B. $-731kJ$

C. $-773kJ$

D. $-229kJ$

Answer: B

28. Which gives nucleophilic addition reaction?

A. Hydrolysis of ethyl chloride by NaOH

B. Purification of acetaldehyde by $NaHSO_3$

C. Alkylation of anisole

D. Decarboxylation of acetic acid

Answer: B

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29. Amongst the compounds given, the one that would form a brilliant colored dye on treatment with $NaNO_2$ in dil. HCl followed by addition to an alkaline solution of β — naphthol is

A.

B.

C.

D.
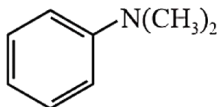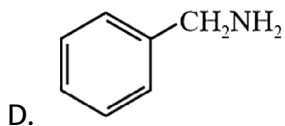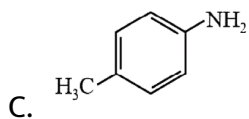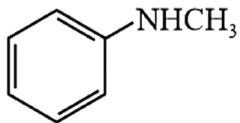
Answer: C

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30. The spin only magnetic moment of Fe^{3+} ion (inBM) is approximately

A. 1.73 BM

B. 3.87 BM

C. 4.90 BM

D. 5.92 BM

Answer: D

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31. A metal crystallizes in bcc lattice. The percent fraction of edge length not covered by atom is

A. $10.4\,\%$

B. $13.4\,\%$

C. $12.4\,\%$

D. $11.4\,\%$

Answer: B

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32. pH of $0.1M$ BOH (weak base)is found to be 12 .The solution at temperature T K will display an osmotic pressure equal to

A. $0.01RT$

B. $0.01(RT)^2$

C. $0.11RT$

D. $1.1RT$

Answer: C

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33. The standard reducution potentials of $Zn^{2+}|Zn$, $Cu^{2+}|Cu$ and $Ag^+|Ag$ are respectively $-0.76, 0.34$ and $0.8V$. The following cells were constructed.

$Zn|Zn^{2+}||Cu^{2+}|Cu$

$Zn | Zn^{2+}||Ag^+|Ag$

$Cu | Cu^{2+}||Ag^+|Ag$
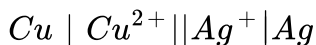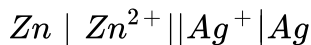
What is the correct order E^0_{cell} of these cell?

A. $II > III > I$

B. $II > I > III$

C. $I > II > III$

D. $III > I > II$
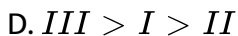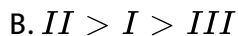
Answer: B

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34. Which one of the following is expected to exhibit optical isomerism (en=ethylenediamine)?

A. Cis $- \left[Pt(NH_3)_3Cl_2\right]$

B. trans$- \left[Pt(NH_3)_3Cl_2\right]$

C. cis $- \left[Co(en)_2Cl_2\right]^+$

D. trans $- \left[Co(en)_2Cl_2\right]^+$
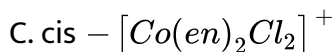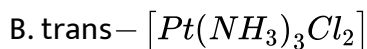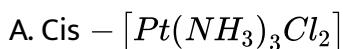
Answer: C

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35. How much chlorine will be liberated on passing one ampere current for 30 minutes through NaCl solution ?

A. 0.66 mole

B. 0.33 mole

C. 0.66 g

D. 0.33 g

Answer: C

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36. The heat of dissociation of benzene in isolated gaseous atoms is 5335 kJ/mol . The bond enthalpies C-C, C = C and C - H bonds are 347.3, 615 and 416.2 kJ respectively. Magnitude of resonance energy of benzene is

A. $1.15kJ$

B. $15.1 kJ$

C. $49.1 kJ$

D. $151 kJ$

Answer: C

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37. For an equilibrium reaction, $N_2O_4(g) \rightleftharpoons 2NO_2(g)$, the concentrations of N_2O_4 and NO_2 at equilibrium are 4.8×10^{-2} and $1.2 \times 10^{-2} mol/L$ respectively. The value of K_c for the reaction is

A. $3 \times 10^{-3} mol/L$

B. $3.3 \times 10^{-3} mol/L$

C. $3 \times 10^{-1} mol/L$

D. $3.3 \times 10^{-1} mol/L$

Answer: A

38. An azeotropic solution of two liquid has boiling point lower than either of them when it

    A. shows negative deviation from Raoult's law

    B. shows no deviation from Raoult's law

    C. shows positive deviation from Raoult's law

    D. is saturated

Answer: C

39. The rate law for the reaction below is given by the expression $k[A][B]$.

$A + B \rightarrow$ product
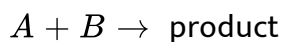
If the concentration of B is increased from 0.1 to 0.3 mole, keeping the value of A at 0.1 mole, the rate constant will be :

A. $3k$

B. $9k$

C. $k/3$

D. k

Answer: D

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40. Nylon -6,6 and polythene are examples of

   A. Copolymerisation biomolecules and Additional polymerisation

     respectively

   B. Condensation polymerisation and Copolymerisation polymerisation

     respectively

   C. Copolymerisation polymerisation and Copolymerisation

     polymerisation respectively

D. None of these

Answer: A

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41. In the equation

$$NO_2^- + H_2O \rightarrow NO_3^- + 2H^+ + ne$$

n stands for

A. 1

B. 2

C. 3

D. 4

Answer: B

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42. If dichloromethane (DCM) and water (H_2O) are used for differential extraction, which one of the following statement is correct ?

    A. DCM and H_2O would stay as upper and lower layer respectively in

       the separating funnel (S.F)

    B. DCM and H_2O will be miscible clearly

    C. DCM and H_2O would stay as lower and upper layer respectively in

       the S.F

    D. DCM and H_2O will make turbid or colloidal mixture

Answer: C

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43. Hard water can block radiators due to the formation of

    A. Insoluble Calcium and Magnesium salts

    B. Insoluble Sodium salts

C. Insoluble Phosphate salts

D. Insoluble Potassium salts

Answer: A

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44. Which one of the Iodine atoms will be more reactive in the S_N1 and S_N2 reaction ?
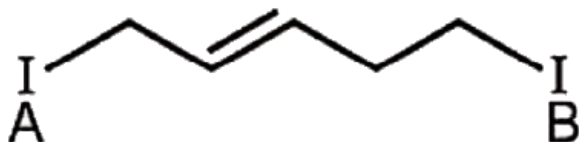
A. A will be faster in S_N1 reaction but slower in S_N2

B. A will be faster both in S_N1 and S_N2

C. A and B will be equally reactive .

D. B will be faster in both S_N1 and S_N2

Answer: B

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45. The alkali metal that reacts with nitrogen directly to form nitride is

A. Li

B. K

C. Na

D. Rb

Answer: A

CHEMISTRY

1. In a $f.c.c.$ arrangement of A and B atoms, where A atoms are at the corners of the unit cell and B atoms at the face $-$ centres, one of the A atom is missing from one corner in each unit cell. The formula of compound is :

A. A_7B_3

B. AB_3

C. A_7B_{24}

D. $A_{7/8}B_5$
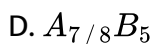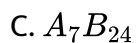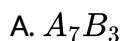
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2. In a first order reaction the concentration of reactant decreases from 800 mol/dm to $50 mol/dm^3$ in $2 \times 10^2 s$. The rate constant of reaction in s^{-1} is
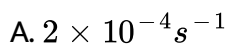
A. $2 \times 10^{-4} s^{-1}$

B. $1.386 \times 10^{-2} s^{-1}$

C. $3.45 \times 10^5 s^{-1}$

D. $2 \times 10^4 s^{-1}$

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3. CO_2 cannot be obtained by heating

A. Na_2CO_3

B. $BeCO_3$

C. Li_2CO_3

D. $C(HCO_3)_2$
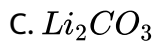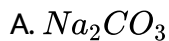
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4. A gas can be compressed to a fraction of its volume.The same volume of a gas can be spread all over a room.The reason for this is that

A. The volume occupied by molecules of a gas is negligible as compared to the total volume of the gas

B. Gases consists of molecules which are in a state of random motion

C. Gases consist of molecules having very large-molecular space which can be reduced or increased

D. none of these

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5. An ideal gas is initially at temperature T and volume V. Its volume is increased by ΔV due to an increase in temperature ΔT, pressure remaining constant. The quantity $\delta = \dfrac{\Delta V}{V\Delta T}$ varies with temperature as

A.

μ

Temperature(K)

B.

μ

Temperature(K)

C.

μ

Temperature(K)

D.

μ

Temperature
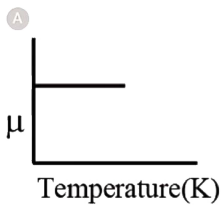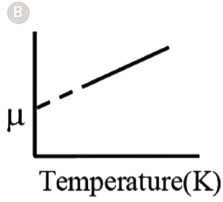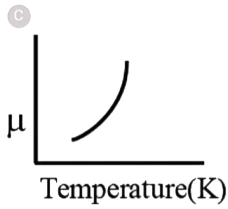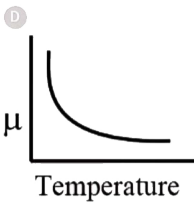
6. Which of the vitamins given below is water soluble ?

A. Vitamin K

B. Vitamin C

C. Vitamin D

D. Vitamine E

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7. What is the composition of the vapour which is in equilibrium at $30 \circ C$ with a benzene-toluene solution with a mole fraction of benzene of (a) 0.400 and (b) 0.600?

$P_b \circ = 119$ torr $, P_t \circ = 37.0$ torr

A. 0.237

B. 0.367

C. 0.428

D. 0.318

8. A compound that easily undergoes bromination is

A. Phenol

B. Toluene

C. Benzene

D. Benzoic acid

$$H_3C \overset{\displaystyle H}{\underset{\displaystyle H}{\diagup\!\!\!\diagdown}} CH_3 \quad \xrightarrow{\text{aq. alkaline } KMnO_4} A$$
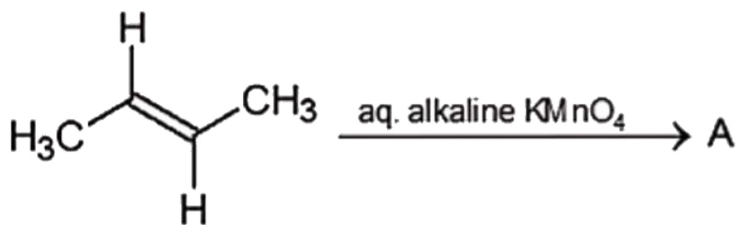
9.

Which one of the following is true about this reaction ?

A. A is meso-2,3-butanediol formed by syn addition

B. A is meso -2,3-butanediol formed by anti-additon

C. A is a racemic mixture of d and l-2,3-butanediol formed by anti-

addition

D. A is a racemic mixture of d and l-2,3-butanediol formed by syn

addition

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10. If Na^+ ion is larger than Mg^{2+} ion and S^{2-} ion is larger than Cl^- ion, which of the following will be least soluble in water?

A. Sodium chloride

B. Sodium sulphide

C. Magnesium chloride

D. Magnesium sulphide

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11. The chemical processes in the production of steel from haematite ore involve

A. Reduction

B. Oxidation

C. Reduction followed by oxidation

D. Oxidation followed by reduction

12. Which of the following is most likely structrure of $CrCI_3.6H_2O$ if $1/3$ of total chlorine of the compound is precipitated by adding $AgNO_3$ to its aqueous solution?

A. $CrCl_3.6H_2O$

B. $[Cr(H_2O)_3Cl_3].3H_2O$

C. $[CrCl_2(H_2O)_4]Cl.2H_2O$

D. $[CrCl(H_2O)_5]Cl_2. H_2O$
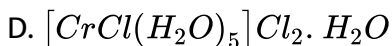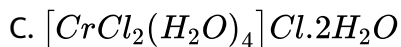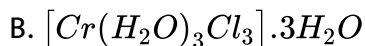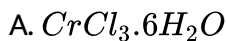
13. The radiation with maximum frequency is

A. X-rays

B. Radio waves

C. UV rays

D. IR rays

14. Which of the following faction is of no significance for roasting sulphide ores to the oxide and not subjecting the sulphide ores in carbon reduction directly ?

A. CO_2 is more volatile than CS_2

B. Metal sulphides are thermodynamically more stable than CS_2

C. CO_2 is thermodynamically more stable than CS_2

D. Metal sulphides are less stable than the corresponding oxides

15. When benzene or its derivative is treated with carbon monoxide and hydrogen chloride in the presence of anhydrous aluminium chloride, it gives

A. Benzaldehyde

B. Benzophenon

C. Benzyl alcohol

D. Benzal chloride

16. Which of the following system is most stable for a chelate ?

A. Two fused cyclic system

B. Three fused cyclic system

C. Four fused cyclic system

D. Five fused cyclic system

17. Which of the following is NOT a transquilizer ?

A. Meprobamate

B. Equanil

C. Chlordiazepoxide

D. Bromopheniramine

18. $N_0/2$ atoms of X(g) are converted into X^+ (g) by energy E_1. $N_0/2$ atoms of X(g) are converted into X^- (g) by the energy E_2 . Hence ionisation potential and electron affinity of X(g) are :

A. $\dfrac{2E_1}{N_0}, \dfrac{2(E_1 - E_2)}{N_0}$

B. $\dfrac{2E_1}{N_0}, \dfrac{2E_2}{N_0}$

C. $\dfrac{(E_1 - E_2)}{N_0}, \dfrac{2E_2}{N_0}$

D. None is correct

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19. Nitrogen forms N_2 but phosphorus forms P_4 due to

A. Triple bond is present between phosphorus atom

B. $p\pi - p\pi$ bonding is strong in nitrogen

C. $p\pi - p\pi$ bonding is weak in nitrogen

D. Multiple bond is formed easily

20. 4 ml of HCl solution of pH = 2 is mixed with 6 ml of NaOH solution of pH=12 . What would be the final pH of solution ?(log 2 = 0.3)

A. 10.3

B. 11.3

C. 11

D. 4.3

21. The correct order in which the O-O bond length increases in the following is

A. $O_2 < O_3 < H_2O_2$

B. $H_2O_2 < O_3 < O_2$

C. $O_3 < O_2 < H_2O_2$

D. $O_2 < H_2O_2 < O_3$
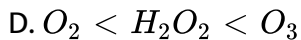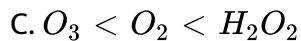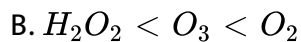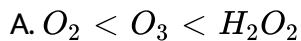
22. The seqeunce of ionic mobility in the aqueous solution is

A. $Rb^+ > K^+ > Cs^+ > Na^+$

B. $Na^+ > K^+ > Rb^+ > Cs^+$

C. $K^+ > Na^+ > Rb^+ > Cs^+$

D. $Cs^+ > Rb^+ > K^+ > Na^+$
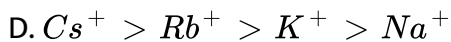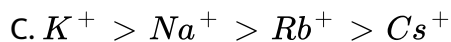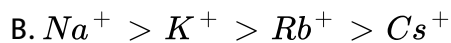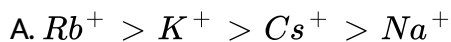
23. For which of the following van't Hoff factor cannot be greater than unity ?

A. $K_4[Fe(CN)_6]$

B. $AlCl_3$

C. NH_2CONH_2

D. KNO_3
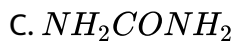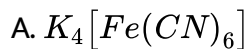
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24. Which of the following exhibits tautomerism ?

A. $(CH_3)_2NH$

B. $(CH_3)_2CNO$

C. R_3CNO_2

D. RCH_2NO_2
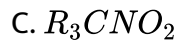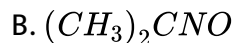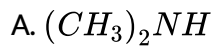
25. Among the following solids, Schottky defect is NOT observed in-

A. Zns

B. NaCl

C. KCl

D. CsCl

26. Which of the following relations gives the value of n =

A. `("Molecular Mass")/("Atomic Mass")

B. $\dfrac{\text{Molecular Mass}}{\text{Empirical Mass}}$

C. $\dfrac{\text{Empirical Mass}}{\text{Molecular Mass}}$

D. None of these

27. The following data is obtained during the first order thermal decomposition of

$2A(g) \rightarrow B(g) + C(s)$ at constant volume and temperature

S.No.	Time	Total pressure
1.	At the end of 10 minutes	300
2.	After completion	200

The rate constant in $\min^{-1}$ is

A. 0.0693

B. 69.3

C. 6.93

D. 6.93×10^{-4}

28. Which of the follwing is the most basic oxide?

A. SeO_2

B. Al_2O_3

C. Sb_2O_3

D. Bi_2O_3

29. When

$$\left[CH_3CH_2CH_2 - \overset{+}{\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{N}}} - CH_2CH_3 \right] OH^- \xrightarrow{\Delta}$$
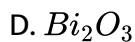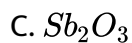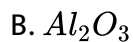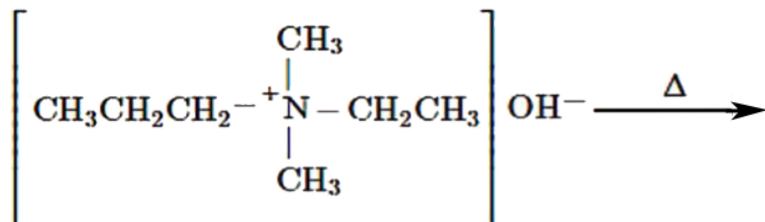
A. Propene is the major product

B. Ethane and $C_3H_7N(CH_3)_2$ are the only product

C. Ethene and propene obtained while ethene as the major product

D. Equimolar amounts of ethane and propene are obtained

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30. The best reagent to convert pent-3-en-2-ol into pent-3-en-2-one is

A. pyridinium chloro-chromate

B. chromic anhydride in glacial acetic acid

C. acidic dichromate

D. acidic permanganate

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31. On oxidation of $S_2O_3^{2-}$ by MnO_4^- in neutral aqueous medium, the oxidation state of S would change from :

A. $+6$ to -2

B. -2 to +2

C. $+2$ to $+6$

D. $+4$ to $+6$

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32. Consider the reaction

$2NO(g) + O_2(g) \rightarrow 2NO_2(g)$, Predict whether the reaction is spontaneous at 298 K. $\Delta_f G(NO) = 86.69kJ/mol$, $\Delta_f G(NO_2) = 51.84kJ/mol$

A. Yes , Spontaneous

B. No, the reaction is Non-spontaneous

C. Equilibrium

D. Cannot predict

33. Determine the stability order of given carbanions :
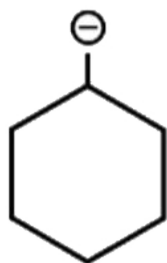
i.   ii.   iii.
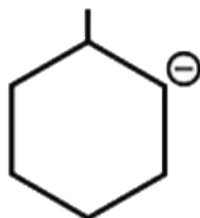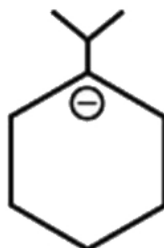
A. $I > II > III$

B. $III > I > II$

C. $III > II > I$

D. $II > III > I$

34. Equanil belongs to which of the following class of drugs ?
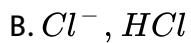
A. Antibiotic

B. Transquilizer

C. Antiseptic

D. Analgesic

35. $[X] + H_2SO_4 \rightarrow [Y]$ a colourless gas with irritating smell

$[Y] + K_2Cr_2O_7 + H_2SO_4 \rightarrow$ green solution $[X]$ and $[Y]$ are

A. SO_3^{2-}, SO_2

B. Cl^-, HCl

C. S^{2-}, H_2S

D. CO_3^{2-}, CO_2
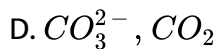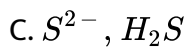
36. An acid solution of $pH = 6$ is diluted 1000 times, the pH of the final solution is

A. 6.01

B. 9

C. 3.5

D. 6.99

37. Periodic classification of elements based on atomic volume curve was given by

A. Newland

B. Lother Mayer

C. Dobereiner

D. Medeleev

38. Which of the following reagents convert the propene to 1-propanol?

A. H_2O, H_2SO_4

B. Aqueous KOH

C. $MgSO_4$, $NaBH_4 / H_2O$

D. B_2H_6, H_2O_2, OH^-

39. The conversion of ethyl chloride into diethyl ether takes place by

A. Williamson's synthesis

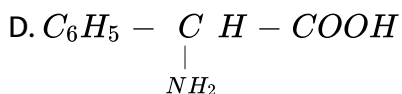B. Perkin's reaction
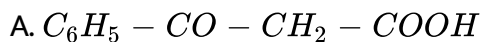
C. Wurtz reaction

D. Grignard reaction

40. In the nucleophilic substitution reactions $(S_N2$ or S_N1) , the reactivity of alkyl halids follows the sequence

A. $R - I > R - Br > R - Cl > R - F$
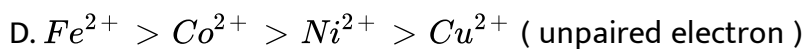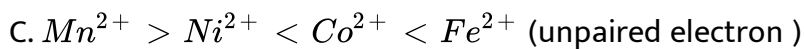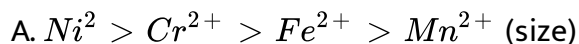
B. $R - Cl > R - F > R - Br > R - I$

C. $R - F > R - Cl > R - Br > R - I$

D. $R - I > R - F > R - Cl > R - Br$
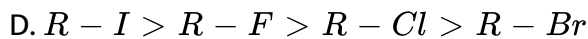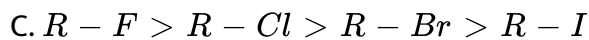
41. Which of the following carboxylic acids undergoes decarboxylation easily ?

A. $C_6H_5 - CO - CH_2 - COOH$

B. $C_6H_5 - CO - COOH$

C. $C_6H_5 - \underset{\underset{OH}{|}}{C}H - COOH$

D. $C_6H_5 - \underset{\underset{NH_2}{|}}{C}H - COOH$
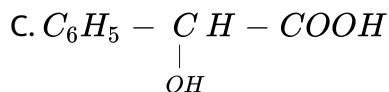
42. Which of the following does not represent the correct order of the properties indicated ?

A. $Ni^2 > Cr^{2+} > Fe^{2+} > Mn^{2+}$ (size)

B. $Sc > Ti > Cr > Fe$ (size)

C. $Mn^{2+} > Ni^{2+} < Co^{2+} < Fe^{2+}$ (unpaired electron)

D. $Fe^{2+} > Co^{2+} > Ni^{2+} > Cu^{2+}$ (unpaired electron)

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43. Maltose on hydrolysis gives

A. Mannose + glucose

B. Galactose + glucose

C. Glucose

D. Mannose + fructose

Answer: C

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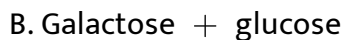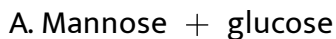
44. The $IUPAC$ name of

$$CH_3 - CH - CH = C - CHO$$
$$\quad\quad\;\; | \quad\quad\quad\quad |$$
$$\quad\quad OH \quad\quad\quad CH_3$$
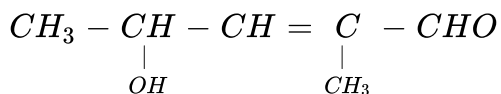
is

A. 4-Hydroxy-1- methylpentanal

B. 4-Hydroxy-2-methylpent-2-en-1-al

C. 2-Hydroxy-4-methylpent-3-en-5-al

D. 2-Hydroxy-3-methylpent-2-en-5-al

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45. Adsorpton of gases on solid surface is generally exothermic because :

A. Enthalpy is positive

B. Entropy decreases

C. Entropy increases

D. Free energy increases

46. Enthalpy of atomization of $C_2H_6(g)$ and $C_3H_8(g)$ are 620 and $880 kJmol^{-1}$ respectively. The C-C and C-H bond energies are respectively

A. 80 and 60 kJ mol^{-1}

B. 80 and 90 kJ mol^{-1}

C. 70 and 90 kJ mol^{-1}

D. 200 and 80 kJ `mol^(-1)

47. Which is the wrong pair?

(i) Starch solution : sol (ii) Aq. NaCl : true solution (iii) Milk : emulsion (iv)

Aq. $BaSO_4$: true solution
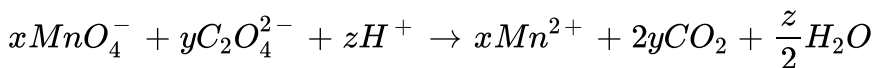
The correct choice is :

A. (i)

B. (iii)

C. (iv)

D. (ii)

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48. Consider the following reaction :

$$x MnO_4^- + yC_2O_4^{2-} + zH^+ \rightarrow x Mn^{2+} + 2yCO_2 + \frac{z}{2}H_2O$$

The value of x, y and z in the reaction are, respectively.

A. 2,5 and 16

B. 5,2 and 8

C. 5,2 and 16

D. 2,5 and 8

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49. A solution of sucrose (molar mass = 342 g/mol) is prepared by dissolving 68.4 g of it per litre of solution, what is its osmotic pressure at 273 K?

$(R = 0.081 Latm K^{-1} mol^{-1})$

A. 4.48 atm

B. 2 atm

C. 1 atm

D. 5 atm

50. At what temperature is the rms speed of H_2 molecules the same as that of oxygen molecules at $1327°\,C$?

A. 173K

B. 100K

C. 400K

D. 523K

51. Determine the degree of association (polymerisation) for the following reaction in aqueous solution ?

$$6HCHO \Leftrightarrow C_6H_{12}O_6$$

If observed (mean) molar mass of $HCHO$ and $C_6H_{12}O_6$ is $150g/mol$.

A. 0.5

B. 0.833

C. 0.9

D. 0.96

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52. In the following reaction, we start with 2 mol of N_2 and 5 mol of H_2 exerting a total pressure of 7 atm at a given temperature is a closed vessel. When 50% of N_2 is converted into NH_3.

$$N_2 + 3H_2 \rightarrow 2NH_3$$
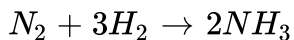
Partial pressure of NH_3 is:

A. 2.8 atm

B. 2 atm

C. 3.2 atm

D. 4 atm

Answer: B

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53. A signature written with carbon pencil weighs 1 mg. What is the number of carbon atoms present in the signature?

A. 6.02×10^{20}

B. 0.502×10^{20}

C. 5.02×10^{23}

D. 5.02×10^{20}

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54. Which of the following orbitals are degernate?

$3d_{xy}$, $4d_{xy}$, $3d_{z^2}$, $3d_{yz}$, $4d_{yz}$, $4d_{z^2}$

A. $3d_{xy}$, $3d_{z^2}$, $3d_{yz}$

B. $4d_{xy}$, $3d_{z^2}$, $3d_{yz}$

C. $3d_{z^2}$, $3d_{yz}$, $5d_{z^2}$

D. none of these

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55. Which of the following is a correct set ?

A. H_2O, sp^3, angular

B. H_2O, sp^2, linear

C. NH_4^+, dsp^2, square planar

D. CH_4, dsp^2, tetrahedral

56. The correct order of the second ionisation potential of carbon, nitrogen, oxygen and fluorine is

A. $F > O > N > C$

B. $C > N > O > F$

C. $O > F > N > C$

D. $O > N > F > C$

57. Al^{3+} has low ionic radius than Mg^{2+} because

A. Al^{3+} has high nuclear charge than Mg^{2+}

B. Mg atom has less no. of neutrons than Al atom

C. Mg and AL Differ in electronegativity values

D. Al atom has low IE value than Mg atom

58. Both lithium and magnesium display several similar properties due to the diagonal relationship , however, the one which is incorrect is

A. Both form soluble bicarbonates

B. Both form nitrides

C. Nitrates of both Li and Mg yield NO_2 and O_2 on heating

D. Both form basic carbonate

59. A mixture of 1.0 mole of Al and 3.0 mole of Cl_2 are allowed to react as:

$2Al(s) + 3Cl_2(g) \rightarrow 2AlCl_3(g)$. Then moles of excess reagent left unreacted is:

A. 3.5

B. 1

C. 1.5

D. 2.5

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60. Which one of the following is present as an active ingredient in bleaching powder for bleaching action?

A. $CaOCl_2$

B. $CaOCl$

C. CaO_2Cl

D. $CaCl_2$

61. n-propyl bromide on treatment with ethanolic potassium hydroxide produces

A. Propene

B. Propane

C. Propyne

D. Propanol

62.
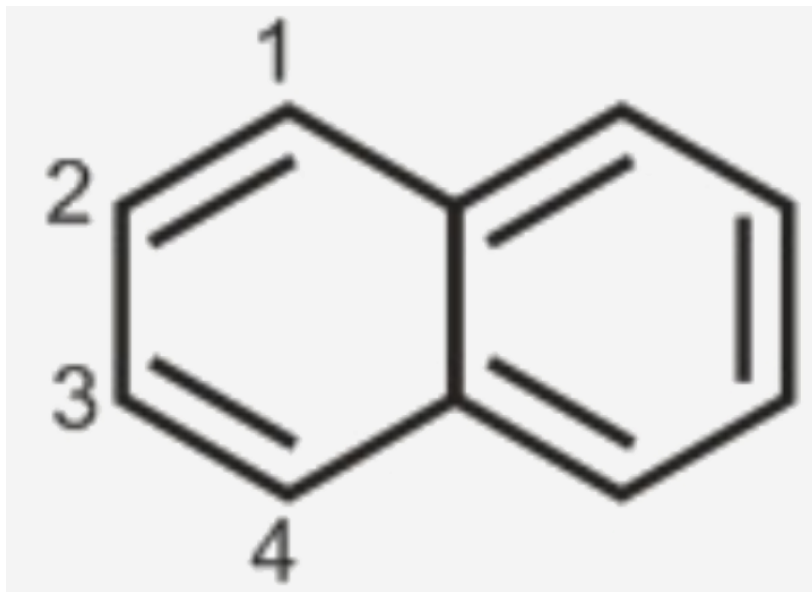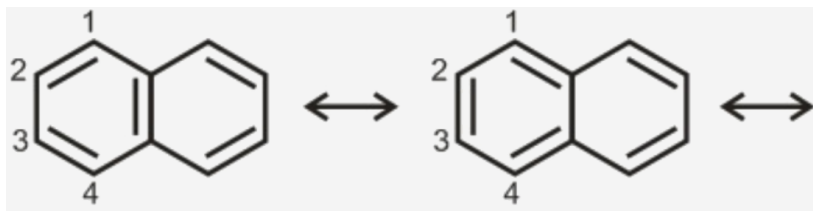
There are three canonical structures of napthalene. Examine them and find correct statement among the following:

A. $C_1 - C_2$ bond is longer than $C_2 - C_3$ bond.

B. all c-c bonds are of same length

C. c1-c2 bond is shorter than c2-c3 bond.

D. none

63. Which one of the following types of drugs reduces fever?

A. Analgesic

B. Antipyretic

C. Antibiotic

D. Tranquiliser

64. Which of the following is called wilkinson's catalyst?

A. $\left[RhCl(PPh_3)_3 \right]$

B. $TiCl_4 + (C_2H_5)_3Al$

C. $(C_2H_5)_4Pb$

D. $\left[PtCl_2(NH_3)_2\right]$
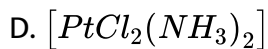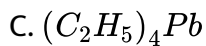
65. Baeyer's reagent is:

A. alkaline permanganate solution

B. acidified permaganate solution

C. neutral permanganate solution

D. aqueous bromine solution

66. Which of the following is/are correct statement(s)?

A. Acetophenone is an ether

B. Diastase is an enzyme

C. Cycloheptane is aromatic compound

D. all of the above

67. Heating mixture of Cu_2O and Cu_2S will give

A. $Cu + SO_2$

B. $Cu + SO_3$

C. $CuO + CuS$

D. Cu_2SO_3

68. The correct charge on and co-ordination number of $'Fe'$ in $K_3[Fe(CN)_6]$ is

A. $+2, 4$

B. $+3, 6$

C. $+2, 6$

D. $+3, 3$

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69. Among the following the coloured compound is .

A. Cu_2Cl_2

B. $K_3[Cu(CN)_4]$

C. CuF_2

D. $[Cu(CH_3CH)_4]BF_4$

70. The IUPAC name of the following compound is
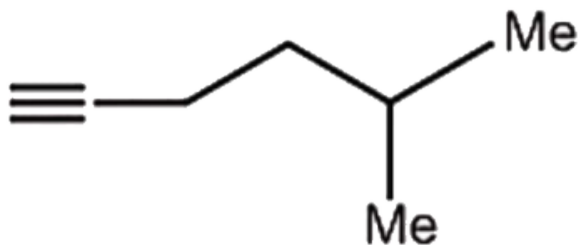
A. 5-methyl-hex-1-yne

B. 4-methyl-hex-2-yne

C. 3-methyl-hex-6-yne

D. 2-methyl-hex-4-yne

71. Energy of an electron is given by $E = -2.178 \times 10^{-18} J\left(\dfrac{Z^2}{n^2}\right)$.

Wavelength of light required to excite an electron in an hydrogen atom from level $n = 1$ to $n = 2$ will be

$\left(h = 6.62 \times 10^{-34} Js \text{ and } c = 3.0 \times 10^8 ms^{-1}\right)$.

    A. $6.500 \times 10^{-7} m$

    B. $8.500 \times 10^{-7} m$

    C. $1.214 \times 10^{-7} m$

    D. $2.816 \times 10^{-7} m$

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72. Which one of the following orders is not in according with the property stated against it ?

    A. $F_2 > Cl_2 > Br_2 > I_2$, Bond dissociation energy

    B. $F_2 > Cl_2 > Br_2 > I_2$, Oxidising power

C. $HI > HBr > HCl > HF$: acidic property in water

D. $F_2 > Cl_2 > Br_2 > I_2$: Electronegativity.

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73. $(X) \xrightarrow{KOH} (Y)$ (gas turns red litmus blue)$+(Z) \xrightarrow{Zn+KOH} (Y)$ (gas).

$(X) \xrightarrow{\Delta}$ gas (does not support combustion) identify (X) to (Z):

A. $X = NH_4NO_2 \quad Y = NH_3 \quad Z = KNO_2$

B. $X = (NH_4)_2Cr_2O_7 \quad Y = NH_3 \quad Z = K_2SO_4$

C. $X = NH_4NO_3 \quad Y = NH_3 \quad Z = KNO_3$
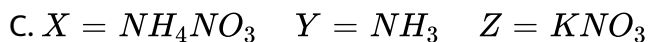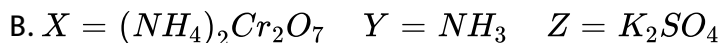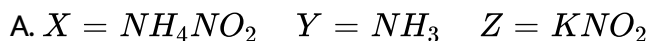
D. none of these

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74. Observation of "Rhumann's purple "is confirmatory test for the presence of :

    A. Starch

    B. Reducing sugar

    C. Protein

    D. Cupric ion

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75. The compound on dehydrogenation gives a ketone. The original compound is :

    A. Primary alcohol

    B. Secondary alcohol

    C. Tertiary alcohol

D. Tertiary alcohol

Answer: A::B::C::D

76. For a reaction $1/2A \rightarrow 2B$, rate of disappearance of A is related to the rate of appearance of B by the expression:

A. $\dfrac{-d[A]}{dt} = \dfrac{1}{2}\dfrac{d[B]}{dt}$

B. $\dfrac{-d[A]}{dt} = 4\dfrac{d[B]}{dt}$

C. $\dfrac{-d[A]}{dt} = \dfrac{1}{4}\dfrac{d[B]}{dt}$

D. $\dfrac{-d[A]}{dt} = \dfrac{d[B]}{dt}$.

77. Which of the following chemical test can distiguish between methylamine and dimethylamine?

A. Carbylamines test

B. Fehling's test

C. Lucas test

D. Tollen's test

78. Electrovalent bond-formation depends on:

A. ionization energy

B. lattice energy

C. electron affinity

D. all of these

79. 0.01 M solution of KCl and $CaCl_2$ are separately prepared in water.

The freezing point of KCl is found to be $-2°C$. What is the freezing point

of $CaCl_2$ aq. Solution if it is completely ionized?

    A. $-3°C$

    B. $+3°C$

    C. $-2°C$

    D. $-4°C$

80. One desires to prepare a positively charged sol of silver iodide. This

can be achieved by:

A. Adding a little $AgNO_3$ solution to KI solution in slight excess

B. Adding a little KI solution to $AgNO_3$ solution in slight excess

C. Mixing equal volumes of equimolar solutions of $AgnO_3$ and KI

D. None of these

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81. Spin only magnetic moment of the compound $Hg[Co(SCN)_4]$ is

A. $\sqrt{3}$

B. $\sqrt{15}$

C. $\sqrt{24}$

D. $\sqrt{8}$

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82. Identify the element that forms amphoteric oxide.

A. Carbon

B. Zinc

C. Calcium

D. Sulphur

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83. The temperature at which the reaction,

$$Ag_2O(s) \rightarrow 2Ag(s) + 1/2O_2(g)$$
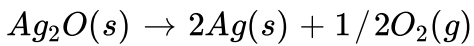
Is at equilibrium is ..., Given $\Delta H = 30.5 KJmol^{-1}$ and ΔS

$= 0.066 KJK^{-1}$

A. 462.6K

B. 486.4K

C. 364.5K

D. 521.2K

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84. Which of the following statements is correct of the manufacture of sulphuric acid by contact process?

A. V_2O_5 is used for catalytic oxidation of SO_2 to SO_3.

B. SO_3 is absorbed in concentrated sulphuric acid.

C. SO_3 is directly absorbed in water.

D. Both the statements V_2O_5 is used for catalytic oxidation of SO_2 to SO_3 and SO_3 is absorbed in concentrated sulphuric acid are correct

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85. The number and type of bonds between two carbon atoms in calcium carbide are

A. Two sigma, two pi

B. two sigma, one pi

C. one sigma, two pi

D. one sigma, one pi

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86. The absolute configuration of

$$CO_2H$$

H——OH
H——Cl
$$CH_3$$
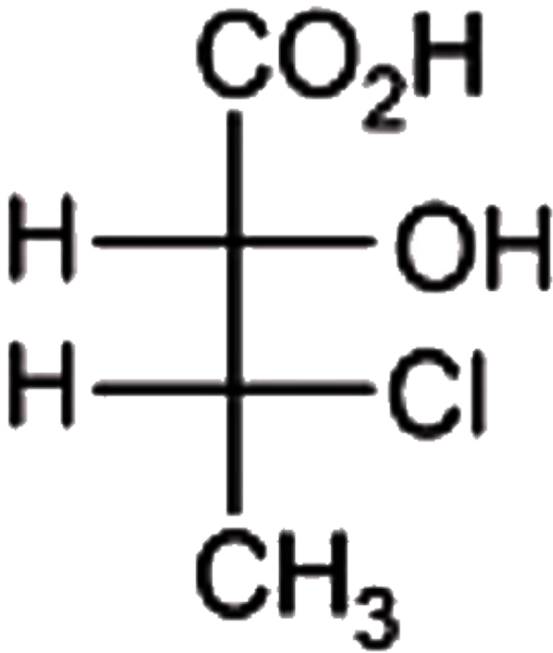
is:

A. (2S,3S)

B. (2R,3R)

C. (2R,3S)

D. (2S,3R)

87. In the Cannizzaro reaction given below:
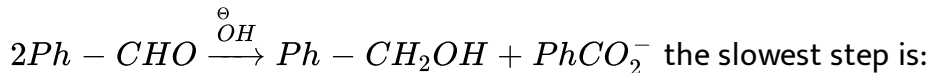
$$2Ph - CHO \xrightarrow{\overset{\ominus}{OH}} Ph - CH_2OH + PhCO_2^- \text{ the slowest step is:}$$

A. The attack of -OH at the carbonyl group

B. The transfer of hydride to the carbonyl group

C. The abstraction of proton from the carboxylic acid

D. None

88. The colour and magnetic nature of mangante ion $\left(MnO_4^{2-}\right)$ is

A. Green, paramagnetic

B. Purple, diamagnetic

C. Green, diamagnetic

D. Purple, paramagnetic

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89. Which of the following does not possess a carboxy group?

A. Picric acid

B. Ethanoic acid

C. Aspirin

D. Benzoic acid

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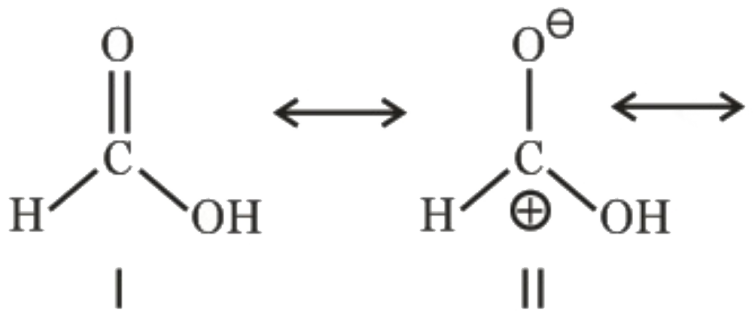
90.
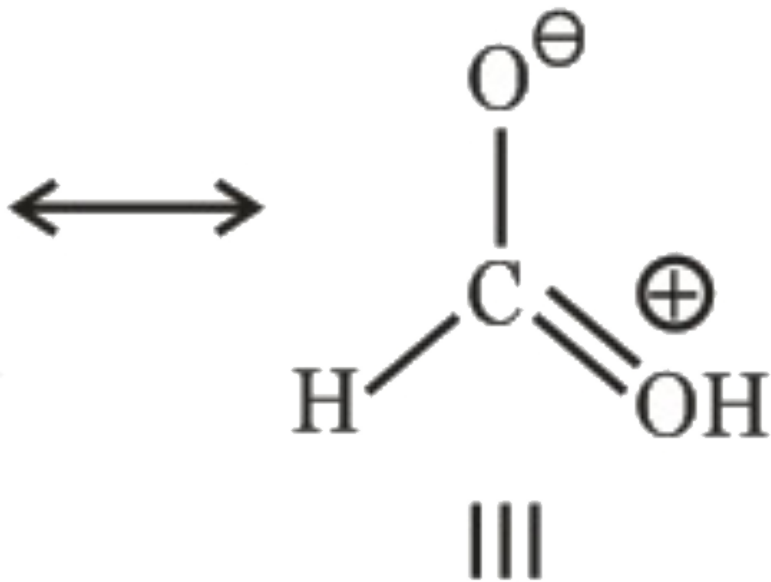
Among these canonical structures, the correct order of stability is

A. I > II > III

B. III > II > I

C. I > III > II

D. II > I > III

91. Phenol $\xrightarrow[\text{(ii)} \ CO_2]{\text{(i) NaOH}}$ (A) $\xrightarrow{H^+ / H_2O}$ (B) $\xrightarrow{Ac_2O}$ (C)
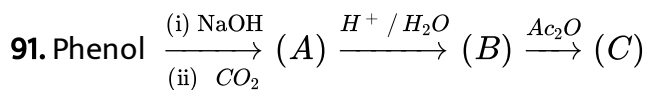
In this reaction , identify the incorrect statement?

A. A is formed through Kolbe reaction

B. B is salicylic acid

C. C is o - acetoxybenzoic acid

D. C is a paracetamol

Answer: D

92. A ambidentate ligand is one which -

A. is linked to the metal atom at two points

B. has two donor atoms at two points

C. has two donor atoms but either of the two can form a co - ordinate

   bond

D. forms chelate rings

Answer: C

93. A gas undergoes change from state A to state B. In this process, the

heat absorbed and work done by the gas is 5 J and 8 J, respectively. Now

gas is brought back to A by another process during which 3 J of heat is

evolved. In this reverse process of B to A:

A. 6 J of the work will be done by the gas

B. 6 J of the work will be done by the surrounding on gas

C. 10 J of the work will be done by the surrounding on gas

D. 10 J of the work will be done by the gas

Answer: B

---

94. If the nitrogen atom has electronic configuration $1s^7$, it would have energy lower than that of the normal ground state configuration $1s^2 2s^2 2p^3$ because the electrons would be closer to the nucleus. Yet $1s^7$ is not observed because it violates

A. Heisenberg's uncertainty principle

B. Hund's rule

C. Pauli exclusion principle

D. Bohr postulate of stationary orbits

Answer: C

95. What is maximum pH required to prevent the precipitation of ZnS in a solution that is 0.01 M $ZnCl_2$ and saturated with 0.10M H_2S?

[Given : $K_{sp}(ZnS) = 10^{-21}$,

$K_{a_1} \times K_{a_2}$ (of H_2S)=10^{-20}]

A. 0

B. 1

C. 2

D. 4

Answer: B

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96. $CH_3 - \overset{\overset{\displaystyle CH_3}{|}}{CH} - \overset{\overset{\displaystyle }{|}}{\underset{\underset{\displaystyle O}{|}}{C}} - O - \overset{\overset{\displaystyle CH_3}{|}}{\underset{\underset{\displaystyle CH_3}{|}}{C}} - CH_3$ The common name of given ester is -

A. neo butyl iso butyrate

B. t - butyl n - butyrate

C. t - butyl iso butyrate

D. iso butyl iso butyrate

Answer: C

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97. At 3000 K the equilibrium pressures of CO_2 CO and O_2 are $0.6, 0.4$ and 0.2 atmospheres respectively. K_p fot the reaction, $2CO_2 \Leftrightarrow 2CO + O_2$ is

A. 0.088

B. 0.0533

C. 0.133

D. 0.177

Answer: A

98. Using electrolytic method, the cost of production of 5L of oxygen at STP, is Rs X, the cost of production of same volume of hydrogen at STP, will be

A. $2C$

B. $\dfrac{X}{2}$

C. $8X$

D. $\dfrac{X}{8}$

Answer: B

99. The maximum percentage of available volume that can be filled in a face centred cubic system by an atom is

A. 74 %

B. 68 %

C. 34 %

D. 26 %

Answer: A

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100. A certain current liberated 0.504 g of hydrogen in 2 hours. How many gram of copper can be liberated by the same current flowing for the same time in $CuSO_4$ solution ?

A. 12.9 g

B. 15.9 g

C. 31.7 g

D. 36.9 g

101. Identify the product A in the following reaction :

$$\xrightarrow{\text{H}_2\text{SO}_5} A$$

A.

B.

C.

D.
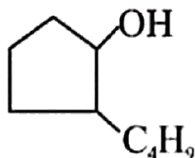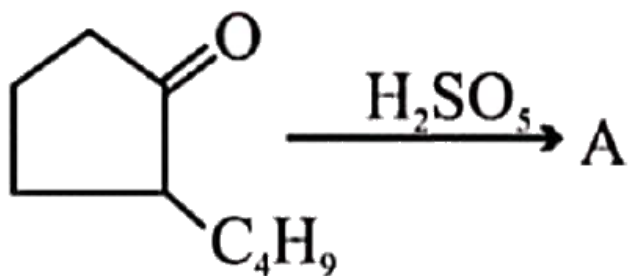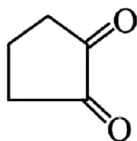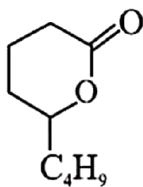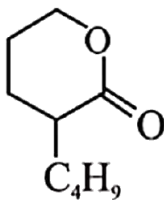
Answer: C

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102. The role of fluorspar during the electrolysis of molten alumina is

(i) To reduce the melting point

(ii) To increase conductivity

(iii) As a seeding agent

A. All are correct

B. Only (i) is correct

C. (i), (ii) are correct

D. (i), (iii) are correct

Answer: C

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103. The reaction, $2SO_{2(g)} + O_{2(g)} \Leftrightarrow 2SO_{3(g)}$ is carried out in a 1 dm^3 and 2 dm^3 vessel separately. The ratio of the reaction velocity will be

A. $1:8$

B. $1:4$

C. $4:1$

D. $8:1$

Answer: D

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104. Fluorine has lower electron affinity than chlorine because of

A. bigger radius of fluorine, less electron density

B. smaller radius of fluorine, high electron density

C. smaller radius of chlorine, high electron density

D. smaller radius of chlorine, less electron density

Answer: B

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105. What is incorrect order of stability?
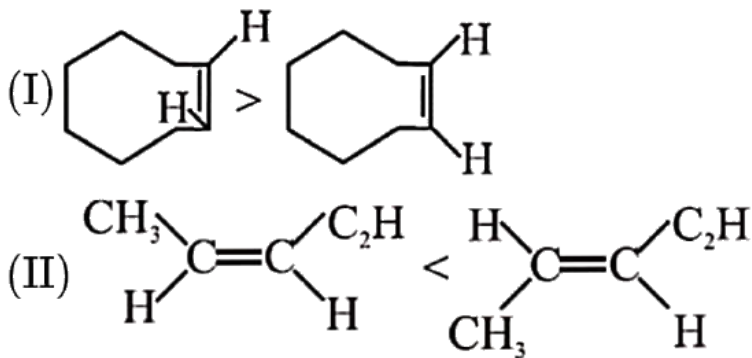
(III) Boat form of 1, 4- cyclohexandiol > Chairformof1,4 - cyclohexandiol

(IV)

$<$
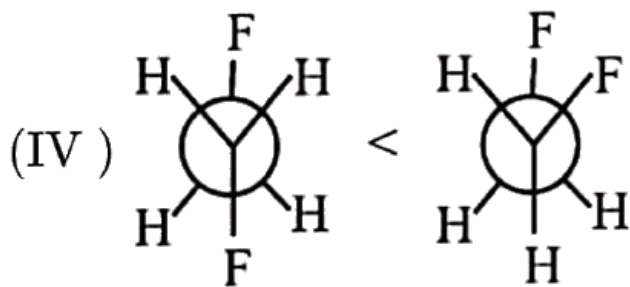
(V) Gauche form of succine acid > Antic from of succinic acid

A. I, II, V

B. I, III, IV

C. I, IV

D. I

Answer: D

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106. Match the following :

	List-I (Ion)		List-II (Shapes)
(p)	Cassiterite	(1)	$FeCO_3$
(q)	Rutile	(2)	$2Fe_2O_3$ $.3H_2O$
(r)	Cerussite	(3)	SnO_2
(s)	Siderite	(4)	$2CuCO_3$ $.Cu(OH)_2$
(t)	Limonite	(5)	$PbCO_3$
		(6)	TiO_2

A. (p) - 6, (q) - 3, (r) - 5, (s) - 4, (t) - 2

B. (p) - 1, (dq) - 3, (r) - 4, (s) - 2, (t) - 6

C. (p) - 3, (q) - 6,(r) - 5, (s) - 1, (t) - 2

D. (p) - 3, (q) - 6, (r) - 4, (s) -1, (t) - 5

Answer: C

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107. Fool's gold is

A. FeS_2

B. $ZnCl_2$

C. $CuFeS_2$

D. Cu_2S
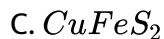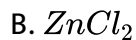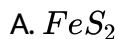
Answer: A

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108. Which of the following statements is invalid-

A. the more stable the carbocation the faster it is formed

B. propyl cation changes to more stable isopropyl carbonation by 1,2

shift of a hydrogen

C. isopropyl chloride reacts with sodium ethoxide to form 1–ethoxypropane

D. propyl halides reacts with sodium ethoxide to form 1-ethoxypropane

Answer: C

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109. Which of the following graph represents the variation of amount of chemisorption of a gas by a solid with temperature under constant pressure?

A.

B.

C.

D.
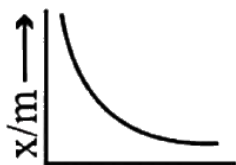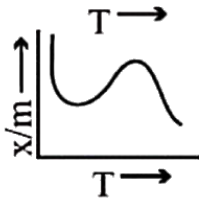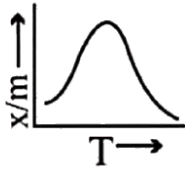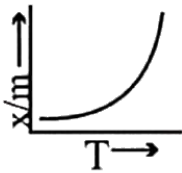
Answer: C

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110. $Na_2B_4O_7.10H_2O$ is correctly represented as

A. $Na_2[B_4O_5OH)_4].8H_2O$

B. $2NaBO_2. Na_2B_2O_3.10H_2O$

C. $Na_2[B_4(H_2O)_4].6H_2O$
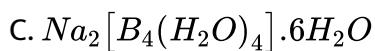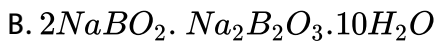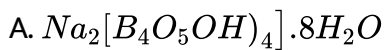
D. `All of the above

Answer: A

111. The phenomenon of optical activity will be shown by:

A.

B.

C.

D.
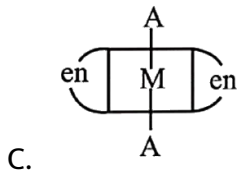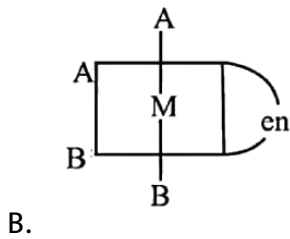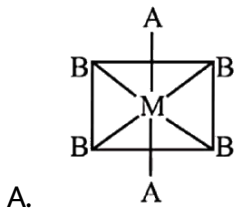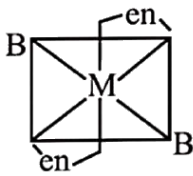
Answer: B

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112. The cylinder contains 100 gm of an ideal gas (mol. wt. = 40 gm/mol) at $27(^{\circ})C$ and 2 atm. pressure. In transportation the cylinder fell and a dent was created. The valve present cannot keep the pressure greater than 2 atm. Hence 10 gm of a gas got leaked out. The volume of the container before and after dent is-

A. 30.8 L , 27.7 L

B. 27.7 L, 30.8 L

C. 30.8 L , 30.8L

D. 27.7 L, 27.7 L

Answer: A

---

113. Which of the following consitute a set of amphoteric species?

(a). H_2O, $H_2PO_3^{\ominus}$, HPO_4^{2-}

(b). $HC_2O_4^{\ominus}$, $H_2PO_4^{\ominus}$, SO_4^{2-}

(c). H_2O, HPO_4^{2-}, $H_2PO_2^{\ominus}$

(d). $H_3O^{\oplus}$, $H_2PO_4^{\ominus}$, $HCO_3^{\ominus}$

A. H_3O^+, $H_2PO_4^-$, HCO_3^-

B. H_2O, HPO_4^{2-}, $H_2PO_2^-$

C. H_2O, $H_2PO_4^-$, HPO_4^{2-}

D. $HC_2O_4^-$, $H_2PO_4^-$, SO_4^{2-}
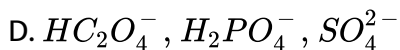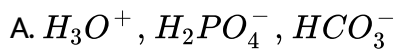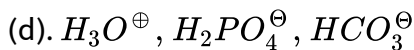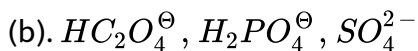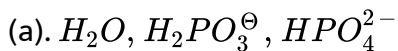
Answer: C

114. Arrange decreasing order of reactivity of these compounds for nucleophilic substitution reaction

(I) $CH_3CH_2 - O - \overset{\overset{O}{||}}{\underset{\underset{O}{||}}{S}} - CF_3$

(II) $CH_3 - CH_2 - OTs$

(III) $CH_3 - \underset{\underset{OH}{|}}{CH} - OH$

(IV) $CH_3 - \underset{\underset{C_6H_5}{|}}{CH} - OH$
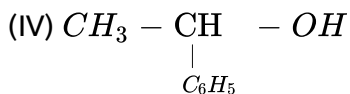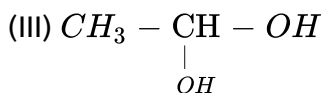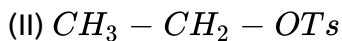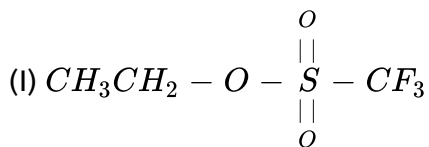
A. III > IV > I > II

B. III > IV > I > II

C. I > II > III > IV

D. I > II > IV > III

Answer: D

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115. Ordinary hydrogen at high temperature is a mixture of :

A. 75 % o - Hydrogen + 25 % p - Hydrogen

B. 25 % o - Hydrogen + 75 % p - Hydrogen

C. 50 % o - Hydrogen + 50 % p - Hydrogen

D. 1 % o - Hydrogen + 99 % p - Hydrogen

Answer: A

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116. Aqua regia reacts with Pt to yeild:

A. $Pt(NO_3)_4$

B. H_2PtCl_6

C. $PtCl_4$

D. $PtCl_2$

Answer: B

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117. H_2S gas can be obtained by the action of water on:

A. CuS

B. FeS

C. Flower of sulphur

D. Al_2S_3

Answer: D

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118. Number of secondary carbon atoms present in the compounds is respectively :
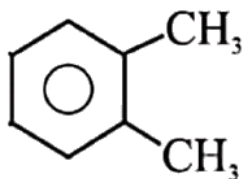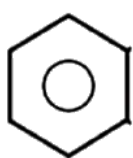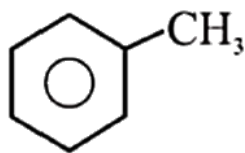
A. 6, 4, 5

B. 4, 6, 5

C. 5, 4, 6

D. 6, 2, 1

Answer: A

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119. Given all the three compounds. Arrange them in decreasing order of reactivity towards electrophile.

(I)

(II)

(III)
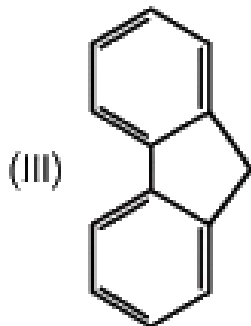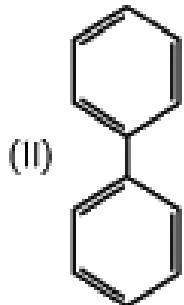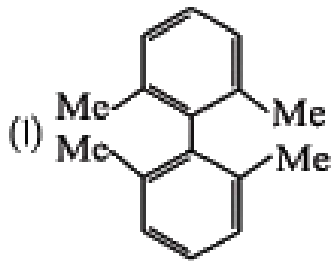
A. I > II > III

B. II > I > III

C. III > II > I

D. II > III > I

Answer: C

120. Arrange priority of CIP sequence of given groups in decreasing order

-

(I) OH

(II) $COOH$

(III) $CHOHCH_3$

(IV) CH_2OH

A. I gt II gt III gt IV

B. IV gt III gt II gt I

C. II gt III gt IV gt I

D. IV gt I gt II gt III

Answer: A

121. In which of the following pairs of molecules/ions, both the species are not likely to exist?

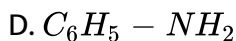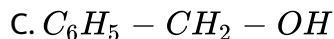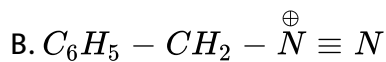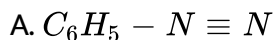A. H_2^{2+}, He_2

B. H_2^-, He_2^{2+}

C. H_2^+, He_2^{2-}

D. H_2^-, He_2^{2-}
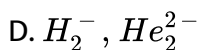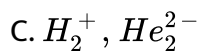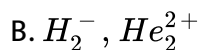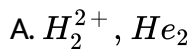
Answer: A

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122. What is the product when $C_6H_5CH_2NH_2$ reacts with HNO_3?

A. $C_6H_5 - N \equiv N$

B. $C_6H_5 - CH_2 - \overset{\oplus}{N} \equiv N$

C. $C_6H_5 - CH_2 - OH$

D. $C_6H_5 - NH_2$

Answer: C

123. Which of the following statements is /are not true?

A. Density of solid gets increased due to interstitial defects

B. Frenkel defects do not alter the density of the solid

C. Non - stoichiometric defects modify the formula of the compound

D. Non - stoichiometric defects do not alter the density of the solid

Answer: D

124. Two liquid X and Y form an ideal solution. At 300K vapour pressure of the solution containing 1 mol of X and 3 mol of Y 550 mm Hg. At the same temperature, if 1 mol of Y is further added to this solution, vapour
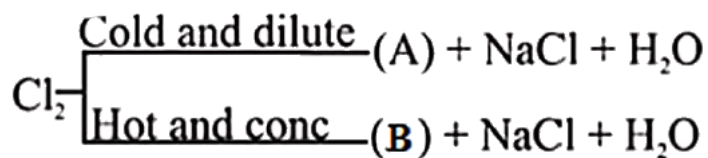
pressure of the solution increases by 10 mm Hg. Vapour pressure (in mmHg) of X and Y in their pure states will be , respectively :

A. 300 and 400

B. 400 and 600

C. 500 and 600

D. 200 and 300

Answer: B

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125. Compound (A) and (B) are -
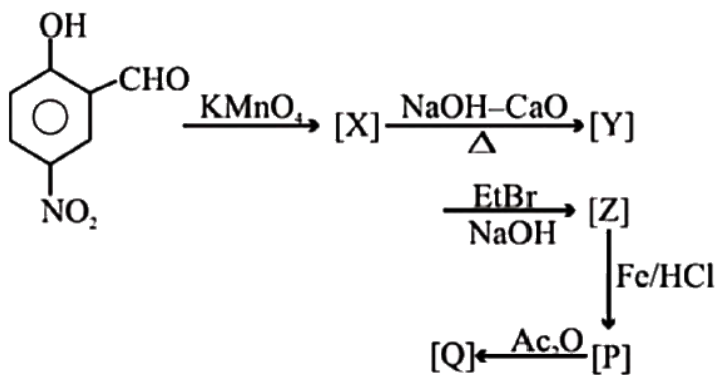
$$Cl_2 \begin{cases} \xrightarrow{\text{Cold and dilute}} (A) + NaCl + H_2O \\ \xrightarrow{\text{Hot and conc}} (B) + NaCl + H_2O \end{cases}$$

A. $NaClO_3, NaClO$

B. $NaClO_2, NaOCl$

C. $NaClO_4, NaClO_3$

D. $NaOCl, NaClO_3$

Answer: D

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$$\text{[X]} \xrightarrow{\text{KMnO}_4} \text{[X]} \xrightarrow[\triangle]{\text{NaOH–CaO}} \text{[Y]}$$

$$\xrightarrow[\text{NaOH}]{\text{EtBr}} \text{[Z]}$$

$$\downarrow \text{Fe/HCl}$$

$$\text{[Q]} \xleftarrow{\text{Ac}_2\text{O}} \text{[P]}$$

126.   **Q is?**

A. Anisidine

B. Toluidine

C. Benzidine

D. Phenacetin

Answer: D

---

127. In the following sequence of reaction, what is D ?

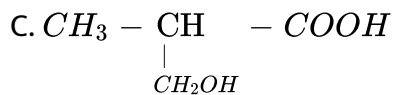$$\text{C}_6\text{H}_5-\text{CH}_3 \xrightarrow{[O]} A \xrightarrow{SOCl_2} B \xrightarrow{NaN_3} C \xrightarrow{Heat} D$$
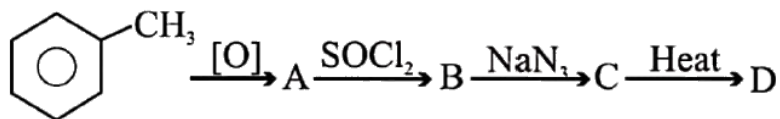
A. Primary amine

B. An amide

C. Phenyl isocyanate

D. A chain lengthened hydrocarbon

Answer: C

128. An optically active compound 'X' has molecular formula $C_4H_8O_3$. It evolves CO_2 with $NaHCO_3$. 'X' reacts with $LiAIH_4$ to give an achiral compound 'X' is:

A. $CH_3 - CH_2 - \underset{\underset{OH}{|}}{CH} - COOH$

B. $CH_3 - \underset{\underset{Me}{|}}{CH} - COOH$

C. $CH_3 - \underset{\underset{CH_2OH}{|}}{CH} \ - COOH$

D. $CH_3 - CH - \underset{\underset{OH}{|}}{CH} \ - COOH$ $_2$
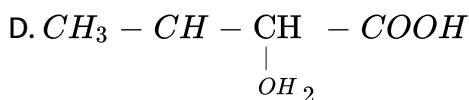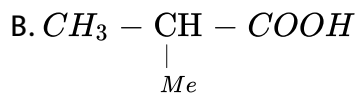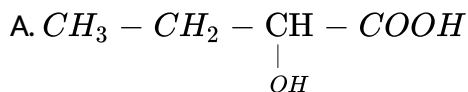
Answer: C

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129. Among the following the region of atmosphere containing ozone

A. Troposphere

B. Thermosphere

C. Mesosphere

D. Stratosphere

Answer: D

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130. Na_2O_2

A. is diamagnetic in nature
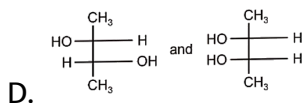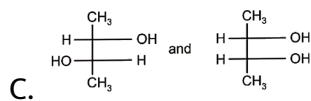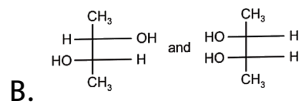
B. is salt of dibasic acid H_2O_2

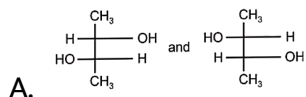C. oxidizes Cr^{3+} (green) to CrO_4^{2-} (yellow)
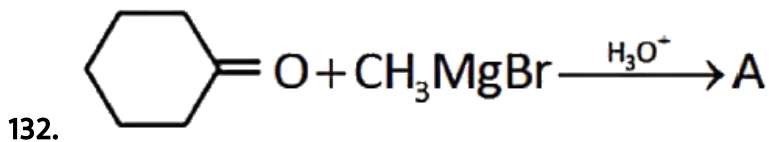
D. all are correct properties of Na_2O_2

Answer: D

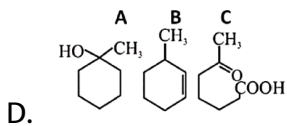**131.** Which of the following pairs of compounds are enantiomers?

A.

B.

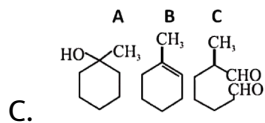C.

D.

Answer: A

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132.

$$\bigcirc\!\!=\!O + CH_3MgBr \xrightarrow{\ H_3O^+\ } A$$

$\xrightarrow[]{\text{Conc. } H_2SO_4} B \xrightarrow[]{O_3 / H_2O / Zn} C.$ A, B and C are -

A.

A   B   C
CH₃ CH₃
HO—CH₃
CHO

B.

A   B   C
CH₂
HO—CH₃
, HCHO

C.

A   B   C
CH₃ CH₃
HO—CH₃
CHO
CHO

D.

A   B   C
CH₃ CH₃
HO—CH₃
COOH
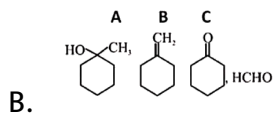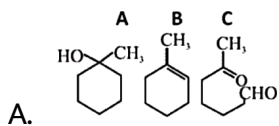
Answer: A

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133. Which one is a biodegradable polymer not falling in polyamide class -

A. Albumin

B. Nylon - 2- nylon 6

C. PHBV

D. Silk

Answer: C

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134. The density of neon will be highest at

A. STP

B. $0°C$, $2atm$

C. $273°C$, $1atm$

D. $0°C$, $2atm$

Answer: B

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135. In what order the reagents Na_2S, $NaCl$ and NaI are added to an aqueous solution containing Ag^+, Cu^{+2} and Ni^{+2} ions in order to precipitate Ag^+ first Cu^{+2} second and Ni^{+2} last.

A. Na_2S, NaI, $NaCl$

B. $NaCl$, Na_2S, NaI

C. NaI, $NaCl$, Na_2S

D. $NaCl$, NaI, Na_2S

Answer: D

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136. Dehydration of cyclopentyl carbinol with conc.H_2SO_4 forms

A. Cyclopentene

B. Cyclohexene

C. Cyclohexane

D. none of these

Answer: D

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137. Hydrogen is :

A. electropositive

B. electronegative

C. both electropositive as well as electronegative

D. neither electropositive nor electronegative

Answer: C

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138. The total volume of dry gaseous products at STP, when 3 moles of electrons are transferred from anode to cathode in the electrolysis of water is :

(Volume of gas a STP =22.4L)

A. 67.2L
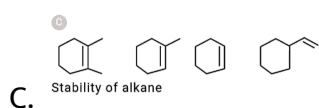
B. 50.4L

C. 44.8L

D. 56.0L

Answer: B

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139. Which of the following is incorrect order ?

A. $CH_3^- > CH_3O^- > HO^- > H_2O$ (Nucleophilicity in protic

solvent)

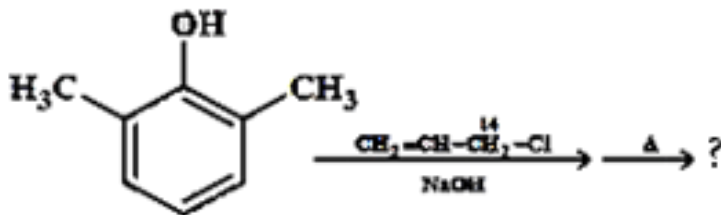B. $Cl^- > CH_3COO^- > CH_3O^- > NH_2^-$ (Leaving group ability)

C. Stability of alkane

D.

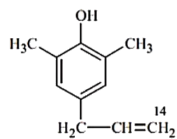$$CH_3 - CH_2 - F > CH_3 - CH_2 - Cl > CH_3 - CH_2 - Br > CH_3$$

(Boiling point)

Answer: D

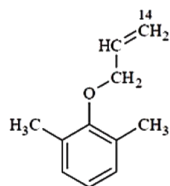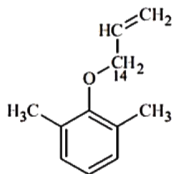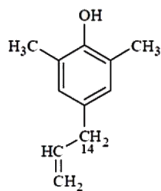▶ **Watch Video Solution**

140.

What is the missing product ?

A.

B.

C.

D.

Answer: A

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141. Complete the following reaction

Product –

A.

B.

C.
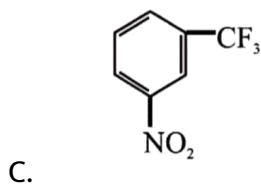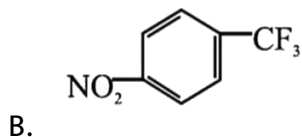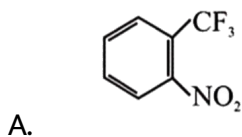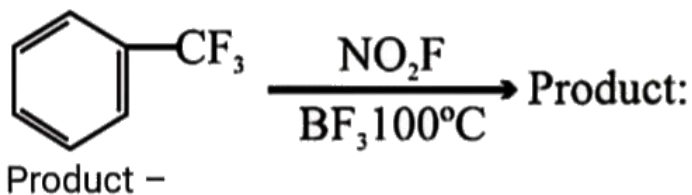
D. Both 'A' and 'B'

Answer: C

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142. Which one is incorrect statement ?

A. He is used in gas cooled nuclear reactors

B. He is used as a cryogenic agent for carrying out experiments at low

temperature

C. He is used to produce and sustain powerful super conducting

magnet is

D. He is used to fill gas bolloons instead of H_2 because it is lighter

than H_2 and non-inflammable

Answer: D

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143. Identify the product in the following reactions :

$$O = \bigcirc = O + 2CH \equiv CH \xrightarrow{CH_3ONa} X$$

A.

OH ─⬡─ OH

B.

HC≡C─⬡─C≡CH

C.

HC≡C─⬡(OH OH)─C≡CH

D.

HO─⌬─OH
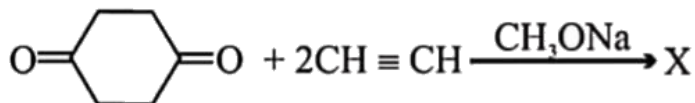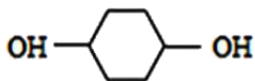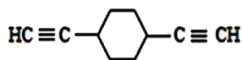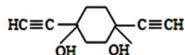
Answer: C

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144. Dissociation of phosphorus pentachloride is favoured by -

A. High temperature and high pressure

B. High temperature and low pressure

C. low temperature and low pressure

D. Low temperature and high pressure

Answer: B

---

145. 2,2-dichloro propane on hydrolysis yields

A. Acetone

B. 2,2-Propane diol

C. Isopropyl alcohol

D. Acetaldehyde

Answer: A

---

146. E° of $Fe^{2+}/Fe = -0.44V$, E° of $Cu/Cu^{2+} = -0.34V$.

Then in the cell

A. Cu^{2+} Oxidizes Fe

B. Fe^{2+} oxidizes Cu

C. Cu Reduces Fe^{2+}

D. Fe reduces Cu^{2+}

Answer: D

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147. Finkelstein reaction -

A. $2CH_3CH_2Cl + Ag_2O(\text{dry}) \rightarrow CH_3CH_2OCH_2CH_3 + 2AgCl$

B. $CH_3CH_2Br + NaI \xrightarrow{\text{Acetone}} CH_3CH_2I + NaBr$

C. $CH_3CH_2Br + Ag_2O(\text{moist}) \rightarrow CH_3CH_2OH + AgBr$

D. $CH_3CH_2Cl + NaOCH_3 \rightarrow CH_3CH_2OCH_3 + NaCl$
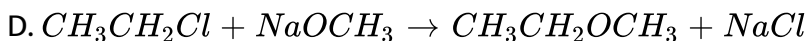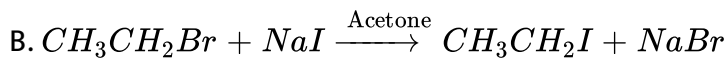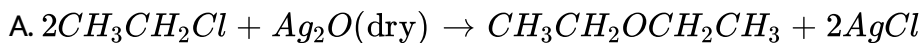
Answer: B

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148. Two solutions of a substance (non-electrolyte) are mixed in the following manner , 480 mL of 1.5 M [first solution] + 520 mL of 1.2 M [second solution] . What is the molarity of the final mixture ?

A. 1.50 M

B. 1.20M

C. 2.70M

D. 1.344M

Answer: D

149. the stability of lyophilic colloids is due to

A. charge on their particles

B. large size of their particles

C. small size of their particles

D. solvation by dispersion medium .

Answer: D

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150. Boron has an exceptionally high melting point in the group 13th elements, because -

A. boron has the smallest size in the group

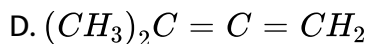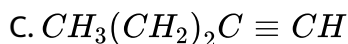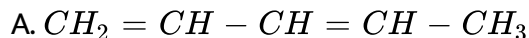B. boron atoms are joined by Vander Waals force

C. boron is covalent solid

D. boron has higher ionisation energy

Answer: C

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151. A compound (C_5H_8) reacts with ammoniacal $AgNO_3$ to give a white precipitate and reacts with excess of $KMnO_4$ solution to give $(CH_3)_2CH - COOH$. The compound is

A. $CH_2 = CH - CH = CH - CH_3$

B. $(CH_3)_2CHC \equiv CH$

C. $CH_3(CH_2)_2C \equiv CH$

D. $(CH_3)_2C = C = CH_2$

Answer: B

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152. Three lines are drawn from a single corner of an FCC unit cell to meet the other corner such that they are found to pass through exactly-1-Octahedral void only , no voids Octahedral void only .Identify the line in the same order -

A. Edge,Face diagonal, Body diagonal

B. Face diagonal , Edge Body diagonal

C. Body diagonal, Face diagonal Edge

D. Edge, Body diagonal, Face diagonal

Answer: A

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153. A coordination compound of cobalt has the molecular, formula containing five ammonia molecules, one nitro group and two chlorine atoms for onew cobalt atom. One mole of this compounds three ions in an aqueous solution. On reacting this solution with excess of $AgNO_3$ solution, we get two moles of AgCI precipitate. The ionic formula for this complex would be

A. $[(Co(NH_3)_4 . NO_2Cl] . [(NH_3)Cl]$

B. $[(Co(NH_3)_5Cl] . [Cl(NO_2)]$
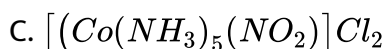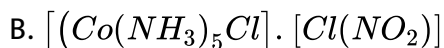
C. $[(Co(NH_3)_5(NO_2)]Cl_2$

D. $[(Co(NH_3)_5] \cdot [(NO_2)_2Cl_2]$

Answer: C

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154. Fixed volume of 0.1M benzoic acid solution is added into 0.2 M soldium benzoate solution and formed a 300 ml, resultant acidic buffer solution. If pH of this buffer solution is 4.5 then find added volume of benzoic acid -

(Given : pK_a benzoic acid =4.2)

    A. 100ml

    B. 150 ml

    C. 200 ml

    D. None of these

Answer: B

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155. The reaction , $2RCHO \xrightarrow{\text{Al-ethoxide}} RCOOCH_2R$ is called -

A. Tischenko reaction

B. Knoevangel reacion

C. Cannizzaro reaction

D. HVZ reaction

Answer: A

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156. Match List I with List II

	List-I		List-II
(a)	Cyanide process	(1)	Ultrapure Ge
(b)	Floatation process	(2)	Pine oil
(c)	Electrolytic reduction	(3)	Extraction of Al
(d)	Zone refining	(4)	Extraction of Au

A. a-3,b-1,c-4,d-2

B. a-4,b-2,c-3,d-1

C. a-3,b-2,c-4,d-1

D. a-4,b-1,c-3,d-2

Answer: B

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157. The structural formula of isopropyl carbinol is-

A. $(CH_3)_2CHOH$

B. $CH_3 - CHOH - CH_2 - CH_3$

C. $(CH_3)_2CH.CH_2OH$

D. $(CH_3)_2COH$

Answer: C

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158. The furnace which gives the highest temperature is

A. blast furnace

B. reverberatory furnace

C. electrical furnace

D. muffle furnace

Answer: C

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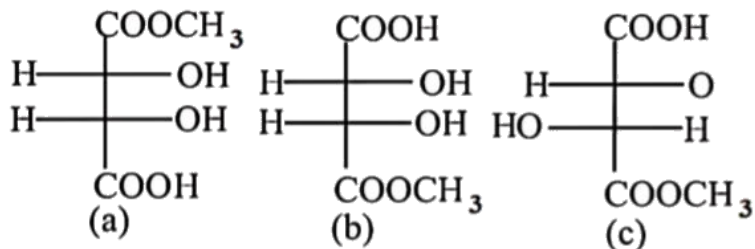**159.** If $\Delta_0 < P$, the correct electronic configuration for d^4 system will be -

A. $t_2^4 e_g^0$

B. $t_{2g}^3 e_g^1$

C. $t_{2g}^0 t_g^4$

D. $t_{2g}^2 e_g^2$

Answer: B

160. The correct statements about the compounds a,b and c is / are -

A. a and b are identical

B. a and b are diastereomers

C. a and c are enantiomers

D. a and b are enantiomers

Answer: D

161. Among the complex ions given below which is/are outar-orbitals complex-I- $\left[Co(CN)_6\right]^{4-}$ II-$\left[Fe(H_2O)_6\right]^{2+}$ III-$\left[FeF_6\right]^{3-}$ IV-$\left[CoF_6\right]^{3-}$

A. II,III,IV

B. II,III only

C. I,IV only

D. II only

Answer: A

162. Out of the following redox reactions

I. $NH_4NO_3 \xrightarrow{\Delta} N_2O + 2H_2O$

II. $NH_4NO_2 \xrightarrow{\Delta} N_2 + 2H_2O$

III. $PCl_5 \xrightarrow{\Delta} PCl_3 + Cl_2$
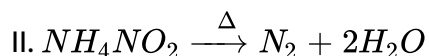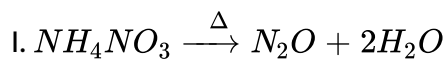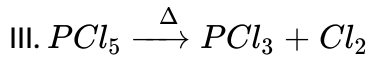
disproportionation is not shown in

A. I and II

B. II and III

C. I and III

D. I, II and III

Answer: D

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163. Which of the following will not form when $NaHCO_3$ solution is added to aqueous $FeCl_3$ solution ?

A. CO_2

B. $Fe(OH)_3$

C. $Fe(HCO_3)_3$

D. $NaCl$

Answer: C

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164. The IUPAC name $C_6H_5 - \underset{\underset{C_6H_5}{|}}{C}H - CH_2 - CCl_3$ is

A. 1,1,1-trichloro -3,3- diphenyl propane

B. 1,1-diphenyl -3,3,3-trichloropropane

C. Both A and B

D. None of these

Answer: A

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165. Minamata disease is due to pollution of

A. Organic waste into drinking water

B. Oil spill in water

C. Industrial waste mercury into fishing water

D. Arsenic into the atmosphere

Answer: C

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166. XeF_6 on complete hydrolysis gives

A. $XeOF_2$

B. XeO_2

C. XeO_3

D. none of these

Answer: C

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167. Benzyl alcohol and sodium benzoate is obtained by the action of sodium hydroxide on benzaldehyde. This reaction is known as

    A. Perkin's reaction

    B. Cannizzaro's reaction

    C. Sandmeyer's reaction

    D. Claisen condensation

Answer: B

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168. A greenish yellow gas reacts with an alkin metal hydroxide to form a halate which can be used in fireworks and saftey matches. The gas and the halate are

    A. Br_2, $KBrO_3$

B. Cl_2, $KClO_3$

C. I_2, $NaIO_3$

D. Cl_2, $NaClO_3$

Answer: B

169. Sodium extract of an organic compound gives blood red colour with $FeCl_3$. It contains

    A. not simple harmonic
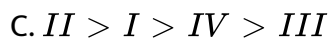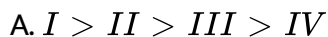
    B. simple harmonic with amplitude 0.2m
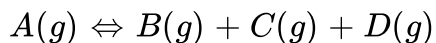
    C. N a & S both

    D. N or S

Answer: C

170. The rate of esterification of acetic acid with methyl alcohol (I) , ethyl alcohol (II) , isopropyl alcohol (III) and teritary butyl alcohol (IV) follow in the order -

A. $I > II > III > IV$

B. $IV > III > II > I$

C. $II > I > IV > III$

D. $III > IV > I > III$

Answer: A

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171. An unknown compound A dissociates at $500°C$ to give products as follows -

$A(g) \Leftrightarrow B(g) + C(g) + D(g)$

Vapour density of the equilibrium mixture is 50 when it dissociates to the extent to 10% . What will be the molecular weight of compound A-
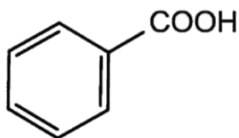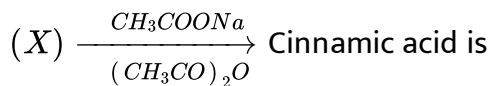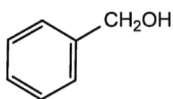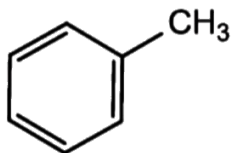
A. 120

B. 130

C. 134

D. 140

Answer: A

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172. The reactant (X) in the reaction,

$$(X) \xrightarrow[(CH_3CO)_2O]{CH_3COONa} \text{Cinnamic acid is}$$

A.

B.

C.

D.
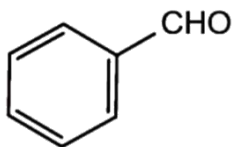
Answer: B

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173. For tetrahedral co-ordination the radius ratio $\left(r^+ / r^-\right)$ should be

A. $0.414 - 0.732$

B. > 0.732

C. 0.156 - 0.225

D. 0.225 - 0.414

Answer: D

174. Which one of the following statements is FALSE ?

A. Raoult's law states that the vapour pressure of a component over a

solution is proportional to its mole fraction in solution

B. The osmotic pressure (π) of a solution is given by the equation

$\pi = iCRT$ where C is the molarity of the solution.

C. The correct order of osmotic pressure for 0.01 M aqueous solution

of each compound is $BaCl_2 > KCl > CH_3COOH >$ sucrose

D. none of these

Answer: D

175. Which of the following are non-reducing sugars -

(i)

(ii)

(iii)

(iv)
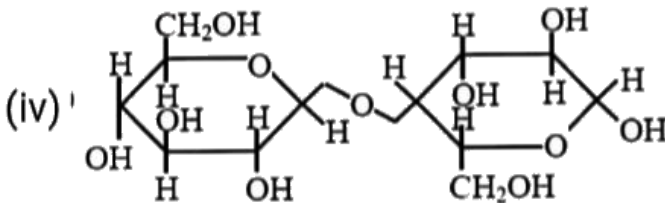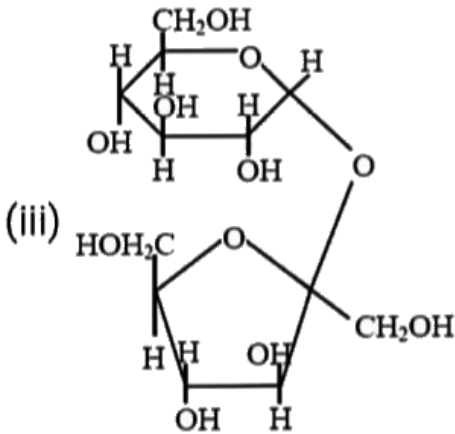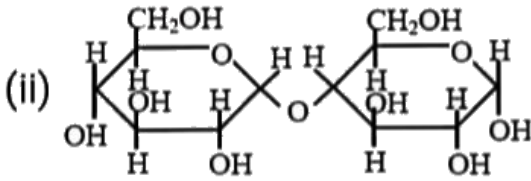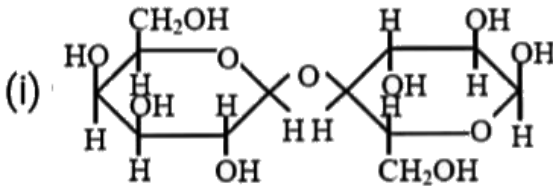
A. i&iv

B. I,II & IV

C. III

D. II & IV

Answer: C

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176. In the Cannizzaro reaction given below:
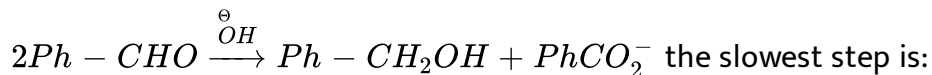
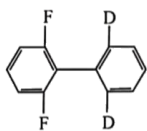$$2Ph - CHO \xrightarrow{\overset{\ominus}{OH}} Ph - CH_2OH + PhCO_2^- \text{ the slowest step is:}$$

A. The attack of OH^- at the carbonyl group

B. The transfer of hydride to the carbonyl group

C. The abstraction of proton from the carboxylic group

D. The deprotonation of pH -CH_2OH

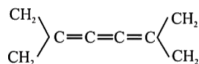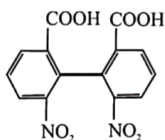**Answer: B**

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177. Which of the following is optical active subtance ?

A.

B.

C.

D. Both (A) and (B)

Answer: C

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178. Coordination compounds plays many important roles in animals and plants. The are essential in the storage and transport of oxygen as electrons transfer agents as catalysts and in photosynthesis Wide range of application in daily life takes place through formation of complexes

Photographic fixing qualitative and quantitative analysis purification of

water metallurgical extraction are some specific worth mentioning

Arrange of the following in order of decreasing number of unpaired

electrons

(I) $[Fe(H_2O))_6]^{2+}$

(II) $[Fe(CN)_6]^{3-}$

(III) $[Fe(CN)_6]^{4-}$

(IV) $[fe(H_2O)_6]^{3+}$
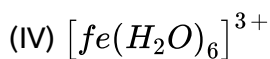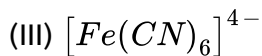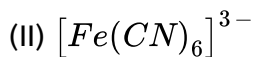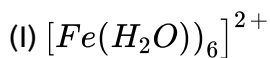
(a) IV,I,II,III

(b) I, II, III, IV

(c) III, II, IIV

(d) II,III,I,IV` .

A. IV,I,II,III

B. I,II,III,IV

C. III,II,I,IV

D. II,III,I,IV

Answer: A

179. The compound $(SiH_3)_3N$ is expected to be

    A. pyramidal and more basic thean $(CH_3)_3N$

    B. planar and less basic than $(CH_3)_3N$

    C. pyramidal and less basic than $(CH_3)_3N$

    D. planar and more basic than $(CH_3)_3N$

Answer: B

180. A certain weak acid has a dissocation constant of 1.0×10^{-4}. The equilibrium constant for its reaction with a strong base is

    A. 1.0×10^{-4}

    B. 1.0×10^{-10}

C. 1.0×10^{-14}

D. 1×10^{10}

Answer: D

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181. Concentrated aqueous solution of sulphuric acid is 98% by mass and has density of 1.80g mL^{-1}. What is the volume of acid required to make one liter $0.1 M H_2 SO_4$ solution ?

A. 16.65 mL

B. 22.20 mL

C. 5.55 mL

D. 11.10 mL

Answer: C

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182. When copper nitrate is strongly heated, the compound obtained is

A. Copper nitrite

B. Copper

C. Copper nitride

D. Copper oxide

Answer: D

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183. $[Fe(H_2O)_6]^{2+}$ and $[Fe(CN)_6]^{4-}$ differ in :

A. Geometry, magnetic moment

B. Magnetic moment and colour

C. Geometry and hybridization

D. None of these

Answer: B

---

184. A gas expands from $3dm^3$ to $5dm^3$ against a constant pressure of 3 atm. The work done during expansion is used to heat 10 mol of water at a temperature of 290 K. Calculate final temperature of water. Specific heat of water $= 4.184Jg^{-1}K^{-1}$

A. 290.81 K

B. 290.61 K

C. 290.41 K

D. 290.21 K

Answer: A

185. Reaction of methyl bromide with aqueous sodium hydroxide involves

A. Racemization

B. S_N1 mechanism

C. Retention of configuration

D. S_N2 mechanism

Answer: D

186. Melmac is a polymer of melamine and

A. addition polymerization of melamine and formaldehyde.

B. free radical polymerisation of acrylonitrile

C. Condensation polymerization of melamine and formaldehyde.

D. coordination polymerisation of melamine.

Answer: C

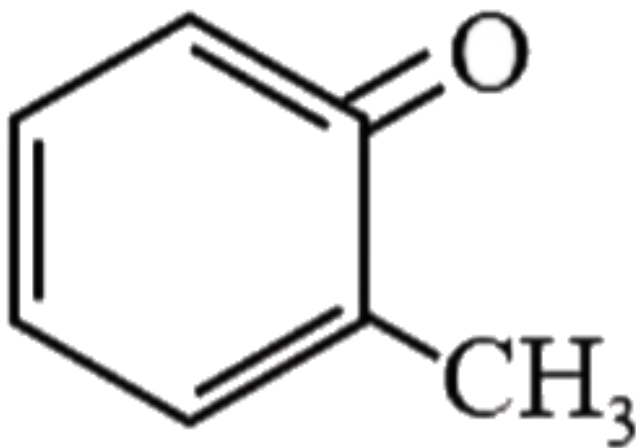**187.** What is the IUPAC name of the following compounds?
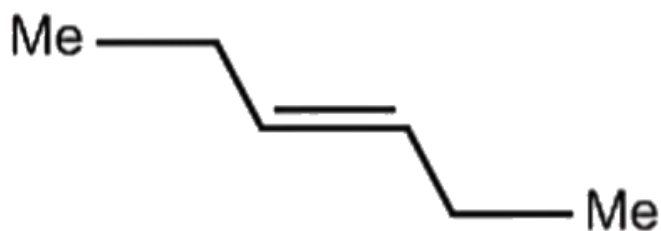
A. trans-hex-3-ene

B. trans-hex-4-ene

C. trans-hex-5-ene

D. trans-hex-6-ene
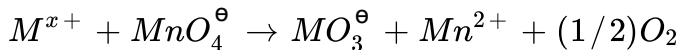
Answer: A

188. IUPAC name for the compound

A. Methylcyclohexanone

B. 2-Methylcyclohexanone

C. Heptanone-2

D. Methylcyclo-hexanone

Answer: B

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189. For the reaction

$$M^{x+} + MnO_4^{\ominus} \rightarrow MO_3^{\ominus} + Mn^{2+} + (1/2)O_2$$

if 1mol of $MnO_4^{\ominus}$ oxidises 1.67mol of M^{x+} to $MO_3^{\ominus}$, then the value of x in the reaction is

A. 5

B. 3

C. 2

D. 1

Answer: C

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190. The equivalent conductances of two strong electrolytes at infinite dilution in H_2O (where ions move freely through a solution) at $25°C$ are given below :

$$\Lambda^\circ_{CH_3COONa} = 91.0 Scm^2 / \text{equi v.}$$

$\Lambda^\circ_{HCl} = 426.2 Scm^2/\text{equiv.}$ What additional information//quantity one need to calculate Λ° of an aqueous solution of acetic acid ?

A. Λ_o of chloroacetic acid $(ClCH_2COOH)$

B. $\Lambda^\circ \text{of} NaCl$

C. $\Lambda^\circ \text{of} CH_3COOK$

D. The limiting equivalent conductance of H^+ $(\lambda^o_{H^+})$

Answer: B

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191. Wrong statement regarding white phosphorus (P_4) is:

A. it has six P - P single bonds

B. it has four P - P single bonds

C. it has four lone pair of electrons

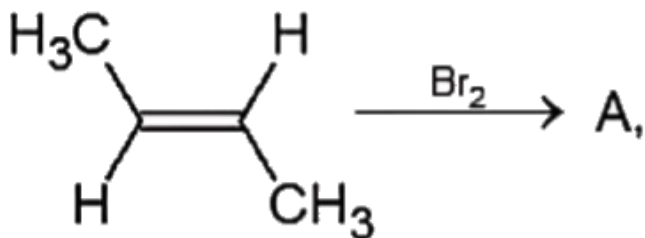D. bond angle around phosphorus is $60°$

Answer: B

192. 2-methylpent-2-ene on ozonolysis will give

A. Propanal only

B. Propanal and ethanal

C. Propanone & propanal

D. Propan-2-ol and ethanal

Answer: C

H₃C, H

$\xrightarrow{\text{Br}_2}$ A,

H CH₃

193.

Which of the following statement is true ?

A. A is formed by anti-addition and is meso

B. A is formed by syn addition and is meso

C. A is formed by anti-addition and is racemic

D. A is formed by syn addition and is racemic

Answer: A

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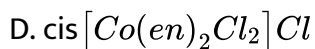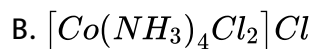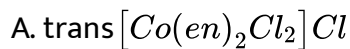194. The orbital diagram in which both the pauli's exclusion principal and Hund's rule are violated is :

A. $\uparrow\downarrow$ $\downarrow$ $\downarrow$ $\downarrow$

B. $\uparrow\downarrow$ $\uparrow\downarrow$ $\uparrow\downarrow$ $\uparrow$

C. $\uparrow\downarrow$ $\uparrow\downarrow$ $\uparrow\downarrow$ ☐

D. $\uparrow\downarrow$ $\uparrow\uparrow$ $\uparrow$ ☐

Answer: D

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195. Which one of the following complexes shows optical isomerism?

A. trans $[Co(en)_2Cl_2]Cl$

B. $[Co(NH_3)_4Cl_2]Cl$

C. $[Co(NH_3)_3Cl_3]$

D. cis $[Co(en)_2Cl_2]Cl$

Answer: D

196. If the end energies of H-H, Br-Br and H-Br are 433, 192 and 364 kJ mol^{-1} respectively, then ΔH° for the reaction, $H_2(g) + Br_2(g) \rightarrow 2HBr(g)$ is

A. $-261kJ$

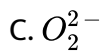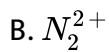B. $+103kJ$

C. $+261kJ$

D. $-103kJ$

Answer: D
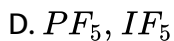
197. Which of the following has unpaired electron(s)?

A. O_2^-

B. N_2^{2+}

C. O_2^{2-}

D. N_2

Answer: A

---

198. The pair of species having identical shapes for molecules of both species is

A. CF_4, SF_4

B. XeF_2, CO_2

C. BF_3, PCl_3

D. PF_5, IF_5
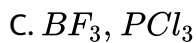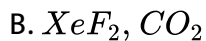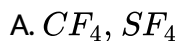
Answer: B

199. Choose from the indicated protons, the one that is most acidic
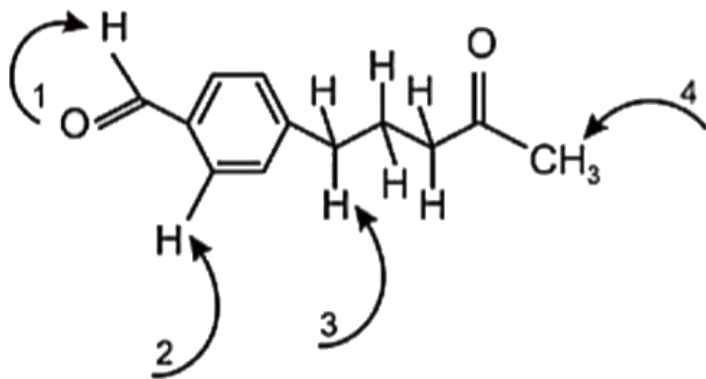
A. 1

B. 2

C. 3

D. 4

Answer: D

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200. The products of the following chemical reactions are

$(i) C_2H_5NH_2 + C_6H_5SO_2Cl \rightarrow$

(ii) $C_2H_5NH_2 + HNO_2 \xrightarrow{H_2O}$

A. $(i) C_6H_5SO_2NHC_2H_5$

(ii) C_2H_5Cl

B. $(i) C_6H_5SO_2NH_2$

(ii) C_2H_5OH

C. $(i) C_6H_5SO_2NHC_2H_5$

(ii) C_2H_5OH
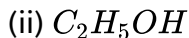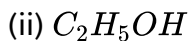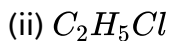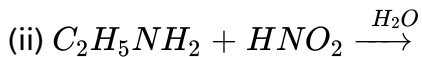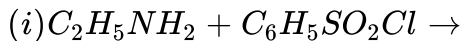
D. None of these

Answer: C

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201. Extraction of gold and silver involves leaching with CN^- ion.silver is later recovered by:

A. Liquation

B. Distillation

C. Zone refining

D. Displacement with Zn

Answer: D

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202. For the reaction mechanism of the reaction

$2NO(g) + 2H_2(g)$
$\rightarrow N_2(g) + 2H_2O(g)$
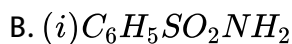$\left(\text{Step I, } 2NO, \overset{k_1}{\rightleftharpoons}, N_2O_2, , , K_{eq}(\text{fast}) \right), \left(\text{Step II, } N_2O_2 + H_2, \overset{k_2}{\longrightarrow}, N_2 \right.$
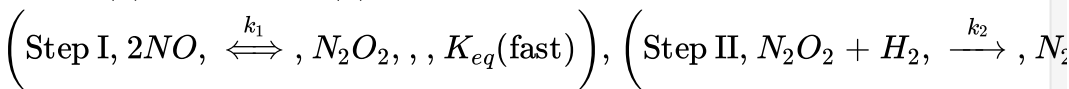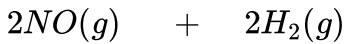
Expression of rate of reaction is

(Take $K_{eq} \times k_2 = k'$)

A. $k'[NO]^2[H_2]$

B. $k'N_2O_2[H_2]$

C. $k'N_2O[H_2]$

D. $k'N_2O_2$
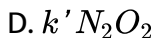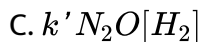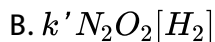
Answer: A

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203. The reaction $A(g) \rightarrow B(g) + 2C(g)$ is a first-order reaction with a rate constant of $2.303 \times 10^{-3}s^{-1}$. Strating with 0.1 moles of 'A' in a 2 litre vessel, find the concentration of A after 301 sec when the reaction is allowed to take place at constant pressure at 300 K.

A. 0.0125 M

B. 0.025 M

C. 0.05 M

D. None of these

Answer: B

---

204. Which of the following is an oxide ore ?

A. SiO_2

B. KO_2

C. BaO_2

D. CsO_2

Answer: A

---

205. $CH_3MgBr + CO_2 \xrightarrow{\text{Dry ether}} Y \xrightarrow{H_3O^{\oplus}} Z$
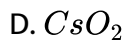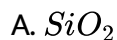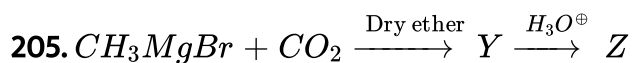
Identify Z from the following.

A. Ethyl acetate

B. Acetic acid

C. Propanoic acid

D. Methyl acetate

Answer: B

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206. 3-Pentanol on reaction with aluminium tertiary butoxide in the presence of acetone gives

A. 3-pentanal

B. 2-pentanal

C. 3-pentanone

D. 2-pentanone

Answer: C

207. In fluorite structure (CaF_2)-

A. Ca^{2+} ions form ccp & F^- ions are present in all the tetrahedral

voids

B. Ca^{2+} ions form ccp & F^- ions are present in all the octahedral

voids

C. Ca^{2+} ions form ccp & F^- ions are present in half of the

octahedral voids and the rest half ions in the tetrahedral voids

D. None

Answer: A

208. $30mL$ of $0.1MBaCl_2$ is mixed with $40mL$ of $0.2MAl_2(SO_4)_3$. What is the weight of $BaSO_4$ formed?

$$BaCl_2 + Al_2(SO_4)_3 \rightarrow BaSO_4 + AlCl_3$$
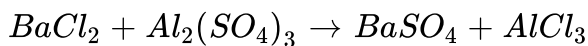
A. 0.999 g

B. 0.699 g

C. 0.799 g

D. 0.99 g

Answer: B

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209. Identify the correct trend given below:

(Atomic No = Ti : 22, Cr : 24 and Mo : 42)

A. $\Delta$of$\left[Cr(H_2O)_6\right]^{2+}$ and $> \left[Mo(H_2O)_6\right]^{2+}$

$\Delta$of$\left[Ti(H_2O)_6\right]^{3+} > \left[Ti(H_2O)_6\right]^{2+}$

B. $\Delta$of$\left[Cr(H_2O)_6\right]^{2+}$ and $> \left[Mo(H_2O)_6\right]^{2+}$

$\Delta$of$\left[Ti(H_2O)_6\right]^{3+} < \left[Ti(H_2O)_6\right]^{2+}$

C. $\Delta$of$\left[Cr(H_2O)_6\right]^{2+}$ and $< \left[Mo(H_2O)_6\right]^{2+}$

$\Delta$of$\left[Ti(H_2O)_6\right]^{3+} > \left[Ti(H_2O)_6\right]^{2+}$

D. $\Delta$of$\left[Cr(H_2O)_6\right]^{2+}$ and $< \left[Mo(H_2O)_6\right]^{2+}$

$\Delta$of$\left[Ti(H_2O)_6\right]^{3+} < \left[Ti(H_2O)_6\right]^{2+}$
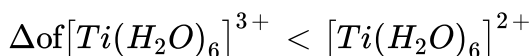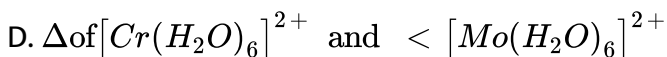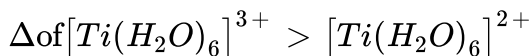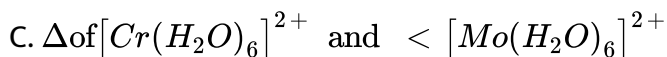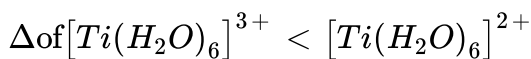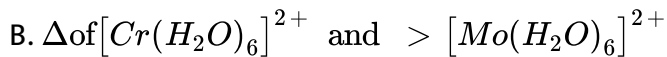
Answer: C

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210. Sewage containing organic waste should not be disposed in water bodies because it causes major water pollution. Fishes in such a polluted water die because of

A. large number of mosquitoes

B. increase in the amount of dissolved oxygen

C. decrease in the amount of dissolved oxygen in water

D. clogging of gills by mud

Answer: C

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211. Densities of diamond and graphite are 3.5 and $2.3 gmL^{-1}$, respectively. The increase of pressure on the equilibrium

$$C_{\text{diamond}} \Leftrightarrow C_{\text{graphite}}$$
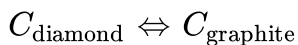
A. Favours backward reaction

B. Favours forwards reaction

C. Forms 3rd allotrope of carbon

D. increase the reaction rate

Answer: A

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212. Which of the following will reduce Tollen's reagent ? Explain.

(a)

(1)

(b)

(2)

A.

B.
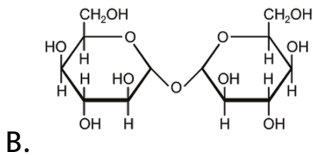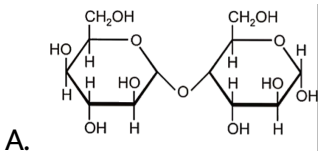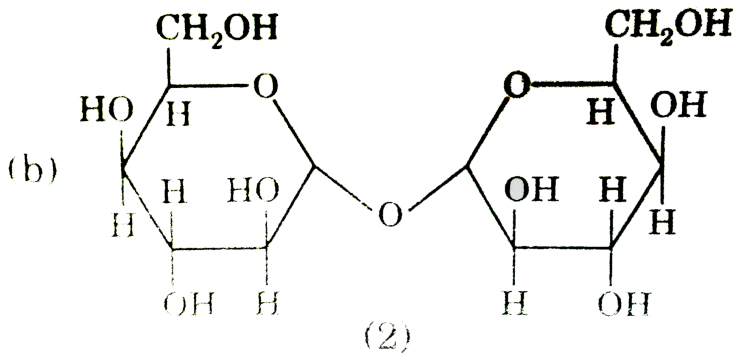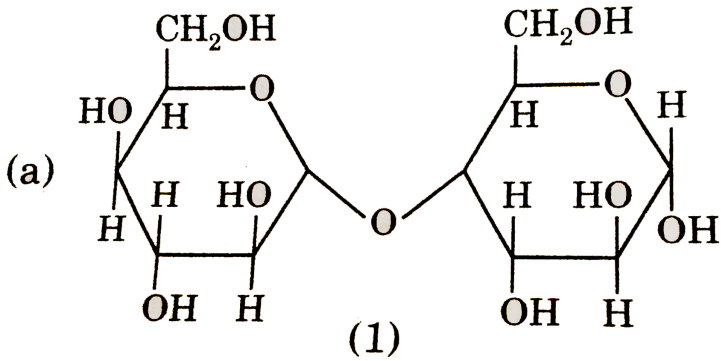
C. Both of them are correct

D. none of these

Answer: A

---

213. Which of the following reaction(s) can be used for the preparation of alkyl halides?

(I) $CH_3CH_2OH + HCl \xrightarrow{anhy.\,ZnCl_2}$

(II) $CH_3CH_2OH + HCl \rightarrow$

(III) $(CH_3)_3COH + HCl \rightarrow$

(IV) $(CH_3)_2CHOH + HCl \xrightarrow{anhy.\,ZnCl_2}$
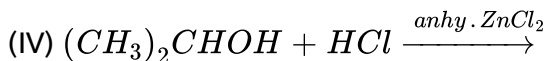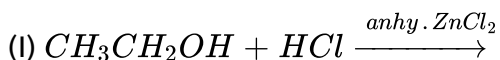
A. I and IV only

B. I and II only

C. IV only

D. III and IV only

Answer: A

214. Osmotic pressure of 40% (wt./vol.) urea solution is $1.64atm$ and that of 3.42% (wt./vol.) cane sugar is $2.46atm$. When equal volumes of the above two solutions are mixed, the osmotic pressure of the resulting solution is:

A. 1.02 atm

B. 2.06 atm

C. 3.04 atm

D. 0.02 atm

Answer: B

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215. Pb^{2+}, Cu^{2+}, Zn^{2+} and Ni^{2+} ions are present in a given acidic solution. On passing hydrogen sulphide gas through this solution, the available precipitate will contain

A. PbS and NiS

B. PbS and CuS

C. CuS and ZnS

D. CuS and NiS

Answer: B

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216. If two molecules of A and B having mass 100 amu and 64 amu respectively and rate of diffusion of A is 12×10^{-3}, then what will be the rate of diffusion of B?

A. 15×10^{-3}

B. 64×10^{-3}

C. 5×10^{-3}

D. 46×10^{-3}

Answer: A

217. Which of the following statement is correct?

A. The bond length in CO is 1.128 Å and CO^+ is 1.115Å because during

conversion of CO to CO^+, electron is removed from anti bonding

orbital

B. The bond length in CO is 1.115 Å and CO^+ is 1.128Å because during

conversion of CO to CO^+, electron is removed from anti bonding

orbital

C. During conversion of CO to CO^+ bond length does not vary

because bond order remain same

D. The bond length in CO is 1.115 Å and CO^+ is 1.128Å because bond

order decreases during conversion of CO to CO^+

218. Tetragonal crystal system has the unit cell dimensions:

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

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

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

D. $a = b \neq c$ and $\alpha = \beta = 90°$ and $\gamma = 120°$

Answer: C

219. When a 20 mL of 0.08 M weak base BOH is titrated with 0.08 M HCl, the pH of the solution at the end point is 5. What will be the pOH if 10 mL

of 0.04 M NaOH is added to the resulting solution?

$[Given: \log 2 = 0.30 \text{ and } \log 3 = 0.48]$

A. 5.40

B. 4.92

C. None of these

D. 5.88

Answer: D

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220. Which of the following catalyses the conversion of glucose into ethanol?

A. Zymase

B. Invertase

C. Maltase

D. Diastase

Answer: A

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221. Which one of the following statements about water is false ?

A. There is extensive intramolecular hydrogen bonding in the condensed phase.

B. Ice formed by heavy water sinks in normal water.

C. Water is oxidized to oxygen during photosynthesis

D. Water can act both as an acid and as a base

Answer: A

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222. The buffer system which helps to maintain the pH of blood between 7.26 to 7.42 is

A. H_2CO_3 / HCO_3^-

B. NH_4OH / NH_4Cl

C. CH_3COOH / CH_3COO^-

D. CH_3COONH_4

Answer: A

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223. Bakelite is a product of the reaction between:

A. Formaldehyde and NaOH

B. Aniline and Urea

C. Phenol and Methanal

D. Phenol and Chloroform

Answer: C

---

224. The first viral disease detected in human being was:

A. cold

B. influenza

C. small pox

D. yellow fever

Answer: D

---

225. An atom has 26 electrons and its atomic weight is 56. The number of neutrons in the nucleus of the atom will be

A. 26

B. 30

C. 36

D. 56

Answer: B

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226. On what ground can you say that scandium $(Z = 21)$ is a transition element but zinc $(Z = 30)$ is not?

A. Incompletely filled 3d orbitals in Sc

B. Coloured compounds

C. variable oxidation state

D. None of the above

Answer: A

227. The catalyst used in the manufactures of polythene by Ziegler-Natta method is:

    A. Titanium tetrachoride and triphenyl aluminium

    B. Titanium tetrachloride and triethyl aluminium

    C. Titanium dioxide

    D. Titanium isoperoxide

Answer: B

228. The carbon -carbon bond distance in benzene is

    A. Longer than a $C - C$ single bond

    B. Longer than a $C = C$ double bond

C. Shorter than a $C = C$ double bond

D. Shorter than a $C \equiv C$ triple bond

Answer: B

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229. The number of atoms in $100 g an f$ crystal with density $d = 10 g / cm^3$ and the edge equal to 100 pm is equal to

A. 1×10^{25}

B. 2×10^{25}

C. 3×10^{25}

D. 4×10^{25}

Answer: D

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230. 1, 44 gran if tutanium (Ti) reacted with excess of O_2 and produce x gram of non $-$ stoichiometric compound $Ti_{1.44}O$. The value of x is :

A. 1.44

B. 2

C. 1.77

D. None of these

Answer: C

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231. 2.56×10^{-3} equivalent of KOH is required to neutralise $0.12544 g H_2 XO_4$.The atomic mass of X (in $g/$ mol) is :

[Given : $H_2 XO_4$ is a dibasic acid]

A. 16

B. 8

C. 7

D. 32

Answer: D

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232. Which one of the following compounds is a peroxide?

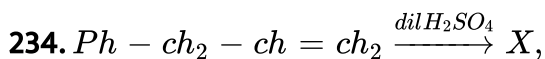A. KO_2

B. BaO_2

C. MnO_2

D. NO_2

Answer: B

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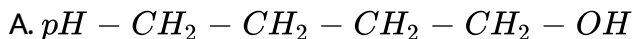**233.** If activation energy, E_a of the reaction is equal to RT then

A. The rate of reaction will be independent on initial concentration of reactant.

B. The rate constant becomes approximately equal to 37% of the Arrhenius constant

C. The rate of reaction becomes infinite
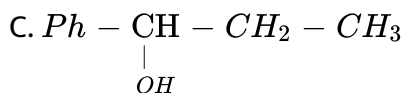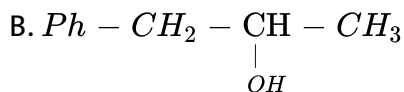
D. The rate of reaction always be first order.

Answer: B

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234. $Ph - ch_2 - ch = ch_2 \xrightarrow{dil\,H_2SO_4} X,$

Identify product $'X'$ is :

A. $pH - CH_2 - CH_2 - CH_2 - CH_2 - OH$

B. $Ph - CH_2 - \underset{\underset{OH}{|}}{CH} - CH_3$

C. $Ph - \underset{\underset{OH}{|}}{CH} - CH_2 - CH_3$

D. $Ph - CH_2 - OH$

Answer: C

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235. The number of g-molecules of oxygen in 6.0×10^{24} CO molecules is:

$\left[Take : N_A = 6 \times 10^{23}\right]$

A. 5 gm molecules

B. 10 gm molecules

C. 1 gm molecules

D. 0.5 gm molecules

Answer: A

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$$CH_3$$

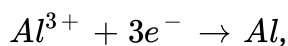$$Br \underline{} H$$

$$CH_2CH_3$$
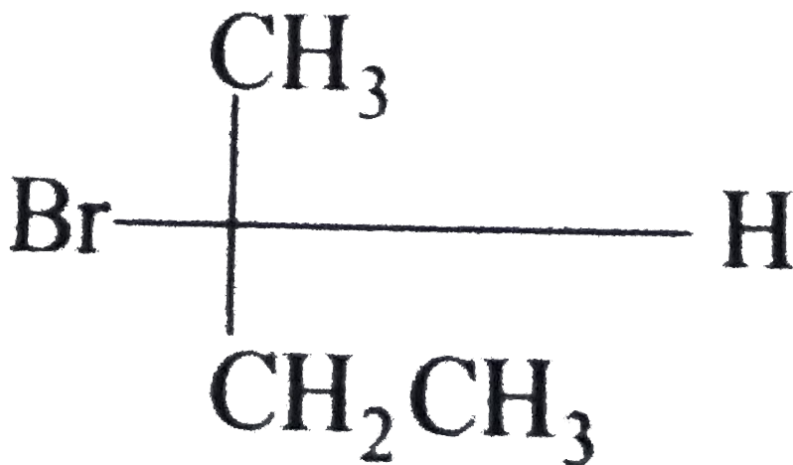
236.

water (through S_{N^2} reaction mechanism) then sterochemistry of product so formed will be:

A. R

B. S

C. Mixture of R and S

D. Partial S $+$ racemic mixture

Answer: B

237. Calculate the amount of electricity required to deposite 0.9 g of aluminium by electrolysis of a salt containing its ion, if the electrode reaction is

$Al^{3+} + 3e^- \rightarrow Al,$

(atomic mass of Al $= 27, 1F = 96500C$)

A. $9.65 \times 10^3 C$

B. $1.93 \times 10^4 C$

C. $9.65 \times 10^4 C$

D. $4.32 \times 10^5 C$

Answer: A

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238. The vapour pressure of water at $20° C is 17.54mm$. When 20g of non - ionic substance is dissolved in 100g of water, the vapour pressure is

lowered by $0.30mm$. What is the molecular mass of the substance ?

A. 200.8 g/mol

B. 206.88 g/mol

C. 210.5 g/mol

D. 215.2 g/mol

Answer: B

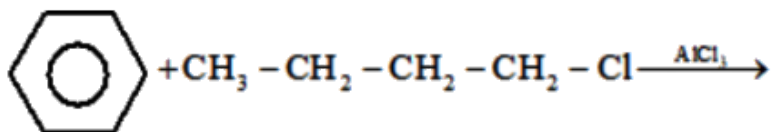▶ **Watch Video Solution**

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239. A weak acid $HX(K_a = 10^{-5})$ on reaction with $NaOH$ gives NaX.

For $0.1M$ aqueous solution of NaX, the % hydrolysis is
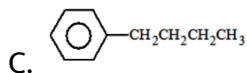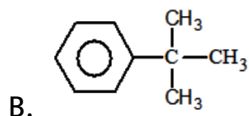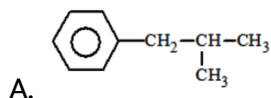
A. 0.001 %

B. 0.01 %

C. 0.15 %

D. 1 %

Answer: B

$$+CH_3-CH_2-CH_2-CH_2-Cl \xrightarrow{AlCl_3}$$

240.

Hydrocarbon (X) major product X is

A.

B.

C.

D. None of these

Answer: D

241. The IUAPC name of ethyl isobutyl ether is

A. 1 - ethoxy propane

B. 1 - ethoxy - 2- methyl propane

C. 1 - ethoxy butane

D. 2 - methyoxy butane

Answer: B

242. Which of the following sets of quantum numbers could represent the last electron added to complete the electron added to complete the electron configuation for a ground state atom of $Br(Z = 35)$ according to Aufbau principle,

A. $4, 0, 0, \quad -\dfrac{1}{2}$

B. $4, 1, 1, \quad -\dfrac{1}{2}$

C. $3, 1, 1, -\dfrac{1}{2}$

D. $4, 1, 2, +\dfrac{1}{2}$

Answer: B

243. Enthalpy of a reaction at $27°C$ is $15\,\text{kJ mol}^{-1}$. The reaction will be feasible if entropy is

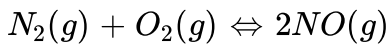A. $15\,\text{J mol}^{-1}K^{-1}$

B. $-50\,\text{J mol}^{-1}K^{-1}$

C. Greater than $50\,\text{J mol}^{-1}K^{-1}$

D. Less than $50\,\text{J mol}^{-1}K^{-1}$

Answer: C

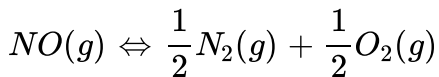**244.** The equilibrium constant for the reaction

$$N_2(g) + O_2(g) \Leftrightarrow 2NO(g)$$

at temperature T is 4×10^{-4}.

The value of K_c for the reaction

$$NO(g) \Leftrightarrow \frac{1}{2}N_2(g) + \frac{1}{2}O_2(g)$$

at the same temperature is

A. 2.5×10^2

B. 50

C. 4×10^{-4}

D. 0.02

Answer: B

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245. Which of the following is correct ?

A. Tin stone is magnetic in nature

B. Wolframite is non - magnetic in nature

C. Wolframite is $FeWO_4$. $MnWO_4$

D. Cassiterite and rutile are sulphides ore

Answer: C

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246. The osmotic pressure of solution containing $34.2g$ of cane sugar (molar mass = 342 g mol^{-1}) in 1 L of solution at $20°C$ is (Given $R = 0.082$ L atm $K^{-1}mol^{-1}$)

A. 2.40 atm

B. 3.6 atm

C. 24 atm

D. 0.0024 atm

Answer: A

247. $C_6H_5OH + CHCl_3 + NaOH \rightarrow$ salicylaldehyde The electrophile involved in the above reaction is.

A. Dichloromethyl cation $(CHCl_2)$

B. Dichlorocarbene $(:CCl_2)$

C. Trichloromethyl anion $\overline{C}Cl_3$

D. Formyl cation (CHO)

Answer: B

248. When aniline is treated will sodium nitrite and hydrochloric acid at $0°C$, it gives

A. Phenol and N_2

B. Diazonium salt

C. Hydrazo compound

D. No reaction takes place

Answer: B

---

249. Which of the following statements about hydrogen is incorrect?

A. Hydrogen has three isotopes of which tritium is the most common.

B. Hydrogen never acts as cation in ionic salts.

C. Hydronium ion, H_3O^+ exists freely in solution.

D. Dihydrogen acts as a reducing agent

Answer: A

250. The angle between the overlapping of one s-orbital and one p-orbital is

    A. $180°$

    B. $120°$

    C. $190°\,28'$

    D. $120°\,60'$

Answer: A

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251. At $25°C$ the pH of water is 7. When temperature of water is increased to $70°C$ than pH of water and nature of water is

    A. pH will decrease and the sample becomes acidic

    B. pH will increase but the sample will remain neutral

    C. pH will remain constant as 7.

D. pH will decrease but the sample will remain neutral.

Answer: D

---

252. An ether is more volatile than an alcohol having the same molecualr 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

Answer: D

253. The drug used as post operative analgesic in medicine is

A. L - Dopa

B. Amoxycilin

C. Sulphapyridine

D. Morphine

Answer: D

254. Higher order (> 3) reaction are rare due to :

A. Loss of active species on collision.

B. Low probability of simultaneous collision of all the reacting species.

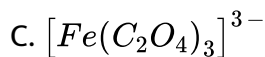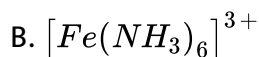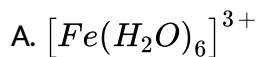C. Increase in entropy and activation energy as more molecules are

   involved.

D. Shifting of equilibrium towards reactants due to elastic collisions.

Answer: B

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255. Amongst the following , the most stable complex is :

(a) $\left[Fe(H_2O)_6\right]^{3+}$ (b) $\left[Fe(NH_3)_6\right]^{3+}$ (c) $\left[Fe(C_2O_4)_3\right]^{3-}$ (d) $\left[FeCl_6\right]^{3-}$.

A. $\left[Fe(H_2O)_6\right]^{3+}$

B. $\left[Fe(NH_3)_6\right]^{3+}$

C. $\left[Fe(C_2O_4)_3\right]^{3-}$

D. $\left[FeCl_6\right]^{3-}$
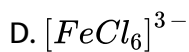
Answer: C

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256. Phenol is a weaker acid than acetic acid because:

A. Phenoxide ion is better stabilized by resonance than acetate ion

B. Acetate ion is better stabilized by resonance than phenoxide ion

C. Phenol is led soluble in water than acetic acid

D. Both phenoxide ion and acetate ion are stable

Answer: B

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257. Select correct statements (s) :

A. Acidic strength of $HBr > HCl$ but reverse is true for their reducing property

B. Basic strength of $PH_3 > AsH_3$ but reverse is true for their $H\widehat{C}H$ bond angle

C. K_{a_1} of fumaric acid is higher than maleic acid but reverse is true for

their K_{a_2}

D. Cassiterite and rutile are sulphides ore

Answer: C

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258. Which of the following statement in relation to the hydrogen atom is correct?

A. 3s, 3p and 3d- orbitals all have the same energy
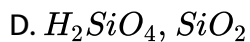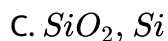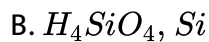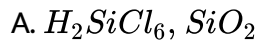
B. 3s and 3p- orbitals is lower energy than 3d- orbtial

C. 3p-orbital is ower in energy than 3d- orbital

D. 3s-orbital is lower in energy than 3p - orbital

Answer: A

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259. Hydrolysis of $SiCl_4$ gives compound 'X' and HCl on heating to $1000°C$ 'X' loses water and forms 'Y'. Identify 'X' and 'Y' respectively.

A. H_2SiCl_6, SiO_2

B. H_4SiO_4, Si

C. SiO_2, Si

D. H_2SiO_4, SiO_2

Answer: D

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260. When dry silver chloride is fused with sodium carbonate, we get pure :

A. Silver

B. Chlorine

C. Sodium

D. Carbomonoxide

Answer: A

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261. The elecron affinity of chlorine is $3.7eV$. How much energy in kcal is released when $2g$ chlorine is completely converted to cl^- ion in a gaseous state ?

$\left(1eV = 23.06kcalmol^{-10}\right)$.

A. 4.80 kCal

B. 5.20 kCal

C. 1.50 kCal

D. 3.60 kCal

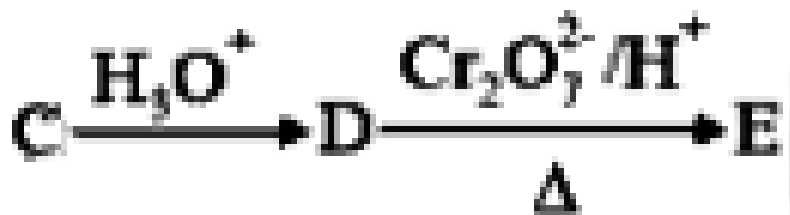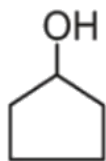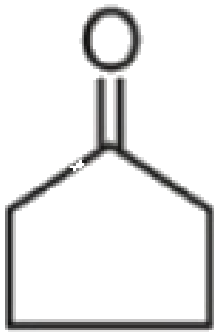**Answer: A**

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OH

$$\text{Conc. } H_2SO_4 \longrightarrow A \xrightarrow{Cl_2/H_2O} B \xrightarrow{CN^-} C$$

262.

$$C \xrightarrow{H_3O^+} D \xrightarrow[\Delta]{Cr_2O_7^{2-}/H^+} E$$
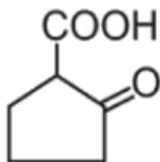
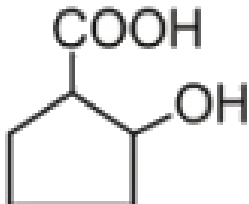E is ?

OH

A.

B.

C.

D.
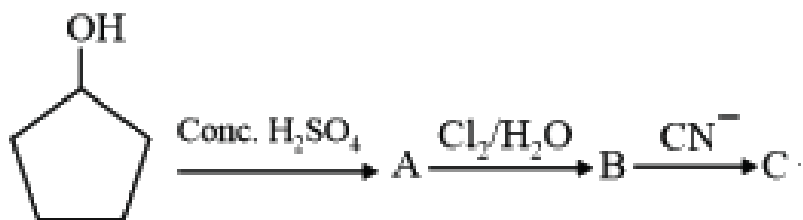
Answer: B

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263. Calculate the total pressure in a 10 litre cylinder which contains $0.4g$ of helium, $1.6g$ of oxygen and $1.4g$ of nitrogen at $27°C$. Also calculate the

partial pressure of helium gas in the cylinder. Assume ideal behaviour of gases. Given $R = 0.082$ litre atm $K^{-1}mol^{-1}$.

A. 0.492 atm

B. 49.2 atm

C. 4.92 atm

D. 0.0492 atm

Answer: A

---

264. $N_0/2$ atoms of X(g) are converted into X^+ (g) by energy E_1. $N_0/2$ atoms of X(g) are converted into X^- (g) by the energy E_2 . Hence ionisation potential and electron affinity of X(g) are :

A. $\dfrac{4E_1}{N_0}, \dfrac{4(E_1 - E_2)}{N_0}$

B. $\dfrac{4E_1}{N_0}, \dfrac{4E_0}{N_0}$

C. $\dfrac{(E_1 - E_2)}{N_0}, \dfrac{4E_2}{N_0}$

D. None is correct

Answer: B

265. Match the following processes of metallurgy with their corresponding ore for which they are used :

(i) Froth floatation method

(a) Germanium

(ii) Electrolytic refining of metals

(b) ZnS

(iii) Zone refining of metals

(c) copper

A. (i) - (c), (ii) - (a), (iii) - (b)

B. (i) - (b), (ii) - (c), (iii) - (a)

C. (i) - (a), (ii) - (c), (iii) - (b)

D. (i) - (a), (ii) - (b), (iii) - (c)

Answer: B

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266. Cow milk is an example of natural emulsion stabilized by

    A. Fat

    B. Water

    C. Casein

    D. Mg^{2+} ions

Answer: C

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267. Only iodine forms hepta-fluroide IF_7, but chlorine and bromine give penta-flurorides. The reason for this is:

A. Low electron affinity of Iodine

B. Unusual pentagonal bipyramidal strucure of lF_7

C. The the larger Iodine atom can accommodate more number of

   smaller Fluorine atom around it

D. Low chemical reactivity of lF_7

Answer: C

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268. The following reaction occurs in the Blast Furnace where ions ore is

reduced to iron metal :

$$Fe_2O_3(s) + 3CO(g) \Leftrightarrow 2Fe(l) + 3CO_2(g)$$
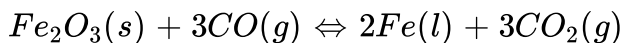
Using the Le Chatelier's principle, predict which one of the following will

not disturb the equilibrium?

A. Addition of CO_2

B. Removal of CO_2

C. Addition of Fe_2O_3

D. Removal of CO

Answer: C

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269. Which of the following phosphorus is the most reactive?

A. Red phosphorus

B. White phosphorus

C. Scarlet phosphorus

D. Violet phosphorus

Answer: B

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$$CH_3 - CH = CH_2 \text{ and } \triangledown$$
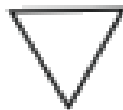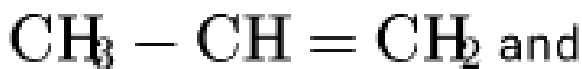
are:

270.

A. Optical isomers

B. Ring Chain isomers

C. Functional Isomers

D. None

Answer: B

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271. Ammonium chloride, crystalliazes in a body centered cubic latteice iwh edge length of unit cell equal to 387pm. If the size of Cl^- ion is 181pm, the size of NH_4^+ ion would be:

A. 154.1 pm

B. 92.6 pm

C. 366.3 pm

D. None of these

Answer: A

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272. Which of the following has the least tendency to dimerise ?

A. NO_2

B. ClO_3

C. ClO_2

D. $Mn(CO)_5$

Answer: C

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273. The ionisation energy of $He^{\oplus}$ is $19.6 \times 10^{-18} Ja \to m^{-1}$ .The energy of the first stationary state of Li^{2+} will be

A. $21.2 \times 10^{-18} J/atom$

B. $44.10 \times 10^{-18} J/atom$

C. $63.2 \times 10^{-18} J/atom$

D. $84.2 \times 10^{-18} J/atom$

Answer: B

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274. The IUPAC name of complex $K_3[Al(C_2O_4)]$ is

A. potassiumaluminoxalate

B. potassiumtrioxalatoaluminate(III)

C. potassiumaluminium (III) oxalate

D. potassiumtrioxalatoaluminate (VI)

Answer: B

275. Copper can be reduced from acidic copper sulphate solution by

A. Silver

B. Iron

C. Carbon

D. Lead

Answer: B

276. Complete the following reaction

A.

$-\ddot{O}-CH \equiv CH_2$

(on cyclopropane)

B.

$-CH_2-CHO$

(on cyclopropane)

C.

D.
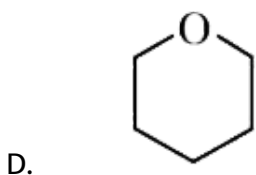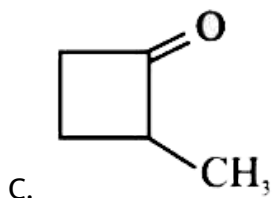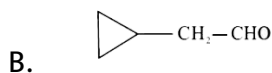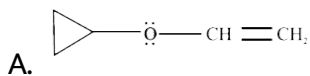
Answer: C

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277. If all the electrolytes removed from the colloid by persistent dialysis then
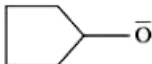
A. Colloid becomes extremely stable

B. Colloids get coagulated

C. No effect is observed

D. Colloids convert into true solution

Answer: B

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278. For an SN^2 reaction of $CH_3 - \overset{\overset{Me}{|}}{C}H - CH_2 - X$ the most effective nucleophile will be
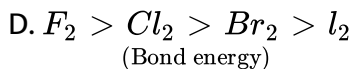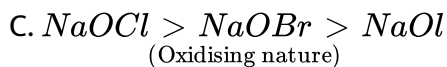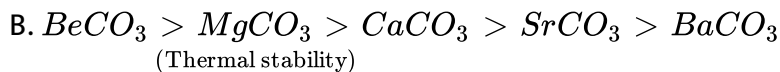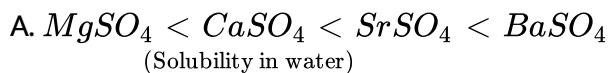
A. MeO^-

B.

C. $Me_2CHO^{\ominus}$

D. $Me_2CH_2O^-$

Answer: A

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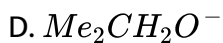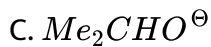
279. Which of the following is correctly matched with the given property?

A. $MgSO_4 < CaSO_4 < SrSO_4 < BaSO_4$
  (Solubility in water)

B. $BeCO_3 > MgCO_3 > CaCO_3 > SrCO_3 > BaCO_3$
  (Thermal stability)

C. $NaOCl > NaOBr > NaOl$
  (Oxidising nature)

D. $F_2 > Cl_2 > Br_2 > l_2$
  (Bond energy)

Answer: C

280. Which of the following molecule has highest dipole moment?

A. BF_3
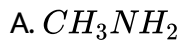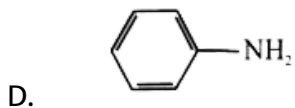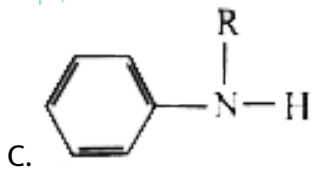
B. NH_3

C. NF_3

D. CCl_4
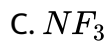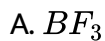
Answer: B

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281. Which of the following amines from $N-$ nitroso derivative when treated with $NaNO_2$ and HCI?
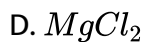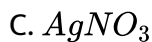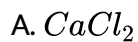
A. CH_3NH_2

B.

—NR₂

C.

D.
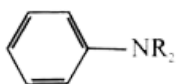
Answer: C

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282. The regent who can't be used to detect the presence of both CO_3^{2-}

and HCO_3^- in a mixture is -

A. $CaCl_2$

B. $SrCl_2$

C. $AgNO_3$

D. $MgCl_2$

Answer: D

283. The change in optical rotation with time of freshly prepared solution of sugar is known as :

    A. specific rotation

    B. inversion

    C. rotation

    D. mutarotation

Answer: D

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284. For a weak electrolyte α_1 and α_2 are in ratio of $1:2$, for a given concentration $k_{a_1} = 2 \times 10^{-4}$. What will be value of k_{a_2}?

    A. 8×10^{-4}

B. 2×10^{-4}

C. 4×10^{-4}

D. 1×10^{-4}

Answer: A

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285. One mole of an ideal gas $(C_V = 20JK^{-1}mol^{-1})$ initially at STP is heated at constant volume to twice the initial temeprature. For the process W and q will be

A. W = 0, q 5.46 kJ

B. W = 0 , q 0

C. W = -5.46kJ , q = 5.46 kJ

D. W = 5.46 kJ , q = 5.46 kJ

Answer: A

286. H_2(g) and O_2(g), can be produced by the electrolysis of water. What total volume (in L) of O_2 and H_2 are produced at 1 atm and 273K when a current of 30 A is passed through a K_2SO_4 (aq) solution for 193 min?
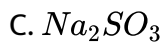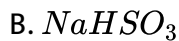
A. 20.16

B. 40.32

C. 60.48

D. 80.64

Answer: C

287. Sodium carbonate reacts with SO_2 in aqueous medium to give

A. $NaHCO_3$

B. $NaHSO_3$

C. Na_2SO_3

D. $NaHSO_4$

Answer: C

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288. Regarding the structure of cyanamide ion, pick out the wrong statement

A. It has one carbon with a negative charge

B. It has two σ bonds

C. It has two π bonds

D. It has two negatively charged Nitrogen atoms

Answer: A

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289. A freshly prepared $Fe(OH)_3$ precipitate is peptized by adding $FeCl_3$ solution. The charge on the colloidal particle is due to preferential adsorption of

A. Cl^- ions

B. Fe^{3+} ions
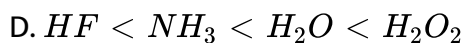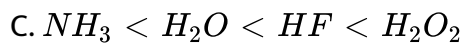
C. OH^- ions

D. Fe^{+2} ions

Answer: B

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290. The correct order of boiling point is :

A. $NH_3 < HF < H_2O < H_2O_2$

B. $NH_3 < HF < H_2O_2 < H_2O$

C. $NH_3 < H_2O < HF < H_2O_2$

D. $HF < NH_3 < H_2O < H_2O_2$

Answer: A

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291. Which of the following statements is wrong -

A. All methyl ketones give a positive iodoform test.

B. Acetaldehyde is the only aldehyde that gives iodoform test.

C. All secondary alcohols give positive iodoform test.

D. Any alcohol that can be oxidised to an acetyl group gives a positive

iodoform test.

Answer: C

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292. In reaction $N_2O_4(g) \rightarrow 2NO_2(g)$, The observed molecular weight 80 gmol^{-1} at 350 K. The percentage dissociation of $N_2O_4(g)$ at 350 K is
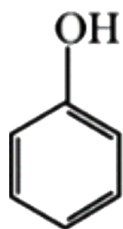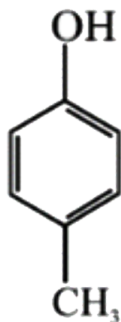
A. 10 %

B. 15 %
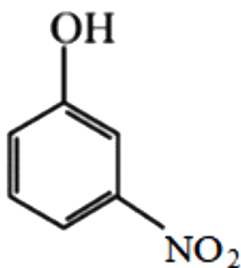
C. 20 %

D. 18 %

Answer: B

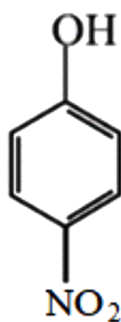▶ Watch Video Solution

293. In the following compounds

The order of acidity is

A. III gt IV gt I gt II

B. I gt IV gt III gt II

C. II gt I gt III gt IV

D. IV gt III gt I gt II

Answer: D

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294. Two liquids A and B have P_A° and P_B° in the ratio of $1:3$ and the ratio of number of moles of A and B in liquid phase are $1:3$ then mole fraction of A in vapour phase in equilibrium with the solution is equal to :

A. 0.1

B. 0.2

C. 0.5

D. 1.0

Answer: A

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295. In the Born-Haber cycle for the formation of solid common salt (NaCl), the largest contribution comes from :

A. The low ionisation energy of Na

B. The high electron affinity of Cl

C. The low ΔH_{vap} of Na (s)

D. The lattice energy

Answer: D

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296. Among the following substituted silanes, the one which will give rise to cross linkes silicons polymer on hydrolysis is

A. R_3SiCl

B. R_4Si

C. $RSiCl_3$

D. R_2SiCl_2

Answer: C

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297. Malonic acid on dehydration with P_4O_{10} gives an oxide, which is

A. linear

B. bent - V - shaped

C. planer

D. tetrahedral

Answer: A

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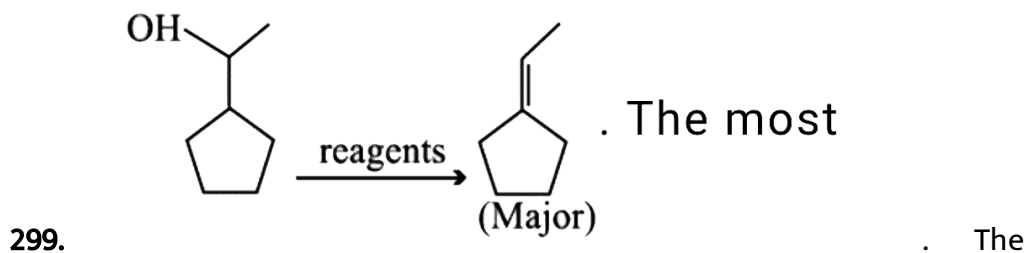**298.** 40 ml $\dfrac{N}{10}HCl$ solution is mixed with 60 ml of $\dfrac{N}{20}KOH$ solution. The resulting mixture will be 0

A. Acidic

B. Basic

C. Neutral

D. Cannot be predicted

Answer: A

299.

OH and reagents → (Major) . The most

. The most appropriate regent for the given reaction can be -

A. Conc. $(H_2SO_4)/\Delta$

B. $(Al_2O_3)/\Delta$

C. $(ThO_2)/\Delta$

D. All of them

Answer: B

300. Increasing basic properties of TiO_2, ZrO_2 and HfO_2 are in order :

A. $TiO_2 < ZrO_2 < HfO_2$

B. $HfO_2 < ZrO_2 < TiO_2$

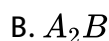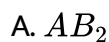C. $HfO_2 < TiO_2 < ZrO_2$

D. $ZrO_2 < TiO_2 < HfO_2$
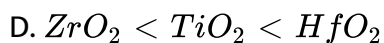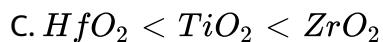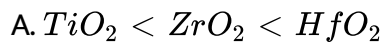
Answer: A

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301. In a solid AB having $NaCl$ structure 'A' atoms occupy the corners & face centre of the cubic unit cell. If all the face centered atoms along one of the axes are removed, then the resultant stoichiomery of the solid is
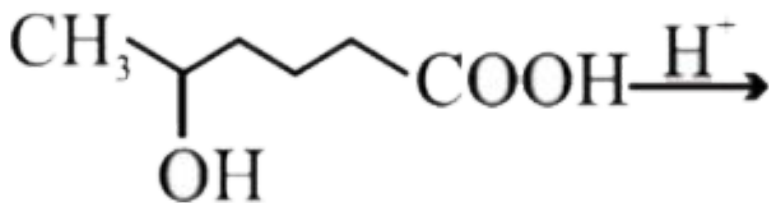
A. AB_2

B. A_2B

C. A_4B_3

D. A_3B_4

Answer: D

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CH₃ ... OH ... COOH → H⁺

302.

Compound A is -

A.

B.

C.

D.
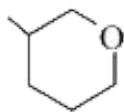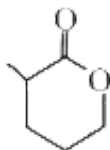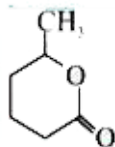
Answer: D

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303. A compound was found to contain nitrogen 28 g and oxygen 80 g.

The formula of the compound is (N = 14, O = 16)

A. NO

B. N_2O_3

C. N_2O_5

D. N_2O_4
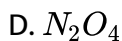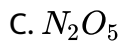
Answer: C

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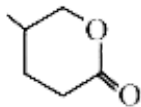**304.** In an isothermal process at 300 K, 1 mole of an ideal gas expands from a pressure 100 atm against an external pressure of 50 atm. Then total entropy change $\left(\text{Cal K}^{-1} \right)$ in the process is -

A. $+0.39$

B. -0.39

C. $+1.59$

D. -1.59

Answer: A

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Me   H
Me   Me
              Hydrogenation
Me   H
         H
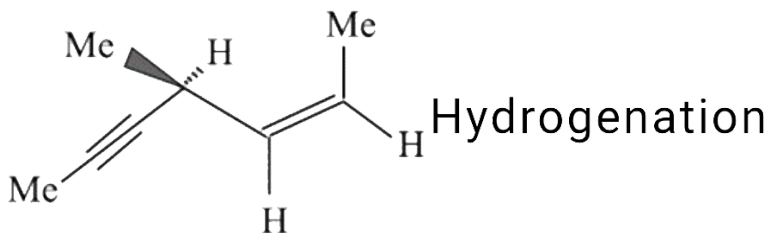
305.

Hydrogenation of the above compound in the presence of sodium in liquid ammonia gives -

A. An optically active compound

B. An optically inactive compound

C. A racemic mixture

D. A diastereomeric mixture

Answer: A

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$$\underset{0.01M\ NaOH}{\longleftarrow} \quad \underset{H_3C}{\overset{H\quad Br}{\diagup}} \quad \underset{4M\ NaOH}{\overset{O^-}{\longrightarrow}}(A)$$
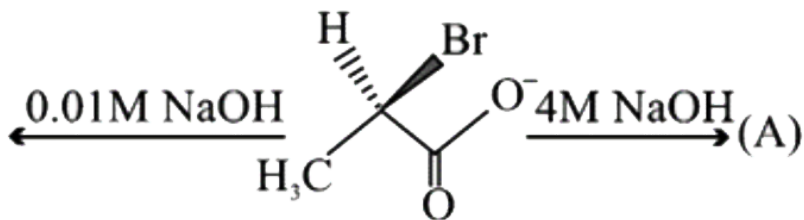
306. Which of

the following is correct regarding compounds [A] and [B] ?

A. [A] and [B] are super imposable mirror images

B. The configuration of [A] is 'R' and [B] is 'S'

C. [A] and [B] are diastereomers

D. [A] is formed with inversion of configuration & [B] with retention of

configuration

Answer: D

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307. Equivalent mass of the reaction

$C_6H_5NO_2 \rightarrow C_6H_5NH_2$.

A. $\dfrac{M}{6}$

B. $\dfrac{M}{3}$

C. $\dfrac{M}{4}$
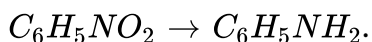
D. $\dfrac{M}{2}$

Answer: A

308. Which of the following statements regarding copper salts is not true?

A. Copper (I) disproportionates into Cu and Cu (II) in aqueous solution

B. Copper (I) can be stabilized by the formation of insoluble complex compounds such as $CuCl_2^-$ and $Cu(CN)_2^-$

C. Copper (II) oxide is red powder

D. Hydrated $CuSO_4$ is $[Cu(H_2O)_4]SO_4 \cdot H_2O$

Answer: C

---

309. Antiseptic chloroxylenol is :

A. 4 - chloro -3, 5-dimethylphenol

B. 3 - chloro -4, 5-dimethylphenol

C. 4-chloro -2, 5- dimethylphenol

D. 5 - chloro -3, 4- dimethylphenol

Answer: A

---

310. Choose the incorrect statement in the following ?

A. Friedel - Crafts reaction between benzene and acetic anhydride in the presence of anhydrous $AlCl_3$ yields acetophenone and not poly substituted products.

B. Acetophenone formed poisons the catalyst preventing further the Friedel - Crafts reaction.

C. During fridel crafts alkylation reaction rearrangement of carbocation takes place.

D. Carbocation is poor electrophile than acylium ion.

Answer: B

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311. Identify the correct statement about the reaction -

$$
\begin{array}{c}
OCOCH_3 \\
H-\!\!\!\!\!-Ph \\
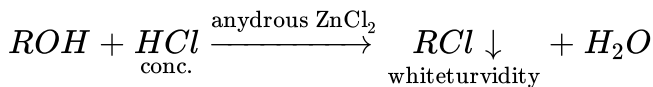H-\!\!\!\!\!-Ph \\
D
\end{array} \quad \xrightarrow{\Delta}
$$

A. it is a syn - eliminiation reaction and gives cis alkene

B. it is an anti-elimination reaction and gives trans alkene
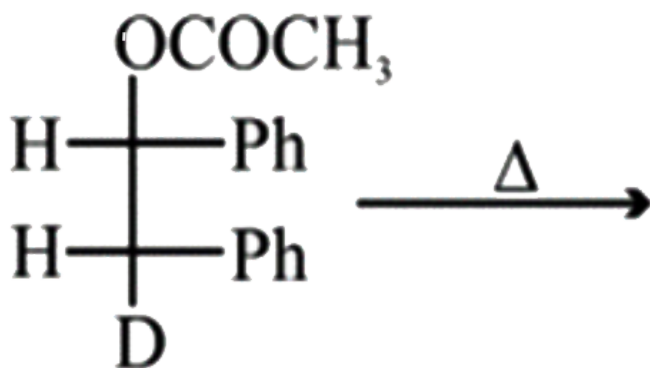
C. it is a syn - elimination reaction and gives Trans alkene

D. the product does not contain deuterium

Answer: C

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312. Lucas test is used to make distinguation between $1°, 2°$ and $3°$ alcohols.

$$ROH + HCl \xrightarrow[\text{conc.}]{\text{anydrous ZnCl}_2} \underset{\text{whiteturvidity}}{RCl \downarrow} + H_2O$$

This shown that -

    A. ROH behavs as a base

    B. greater the value of pK_a (alcohols), greater the reactivity with conc.

       HCl and thus sonner the formation of white tarbidity

    C. both of the above are correct

    D. none of the above is correct
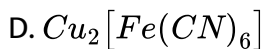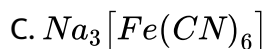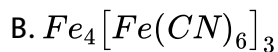
Answer: C

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313. A colourless fuming liquid (A) can be prepared by passing SO_2 over phosphorous pentachloride. The liquid can readily be hydrolysed to give sulphurous acid. The compound (A) is

A. $SOCl_2$

B. SO_2Cl_2

C. SCl_2

D. SCl_4
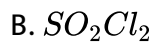
Answer: A

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314. In lassaigne's test a blue colour is obtained if the organic compound contains nitrogen. The blue colour is due to

A. $K_4\left[Fe(CN)_6\right]$

B. $Fe_4\left[Fe(CN)_6\right]_3$

C. $Na_3\left[Fe(CN)_6\right]$

D. $Cu_2\left[Fe(CN)_6\right]$
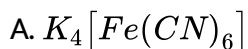
Answer: B

315. The dipole moment of LiH is $1.964 \times 10^{-29} C - m$ and the interatomic diatance between Li and H in this molceule is 1.596Å .What is the per cent ionic character in LiH.

    A. 82.5 %

    B. 63.2 %

    C. 76.8 %

    D. 90.5 %

Answer: C

316. In hydrogen atom, an electron in its ground state absorbs two times of the energy as if requires escaping (13.6 eV) from the atom. The wavelength of the emitted electron will be

A. $1.34 \times 10^{-10} m$

B. $2.34 \times 10^{-10} m$

C. $3.34 \times 10^{-10} m$

D. $4.44 \times 10^{-10} m$

Answer: C

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317. The molal lowering of vapor pressure for H_2O at $100°C$ is

A. 760 mm

B. 750 mm

C. 13.43 mm

D. 0.760 mm

Answer: C

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318. The molar ratio of Fe^{++} to Fe^{+++} in a mixture of $FeSO_4$ and $Fe_2(SO_4)_3$ having equal number of sulphate ions in both ferrous and ferric sulphate is:

A. $1:2$

B. $3:2$

C. $2:3$
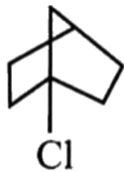
D. can't be determined
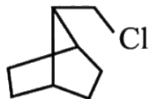
Answer: B

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319. Which of the following is not true for S_{N^1} reaction ?

A. Ethyl chloride

B. Isopropyl chloride

C.

D.

Answer: C

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320. One of the processes used for concentration of ores is Froth floatation process. This process is generally used for concentration of sulphide ores. Sometimes in this process we add NaCN as a depressant. NaCN is generally added in case of ZnS and PbS minerals. what is the purpose of addition of NaCN during the process of Froth floatation?

A. NaCN causes reduction by precipitation

B. A soluble complex is formed by reactio between NaCN and ZnS while PbS forms froth

C. A soluble complex is formed by reaction between NaCN and PbS while ZnS forms froth

D. A precipitate of $Pb(CN)_2$ is produced while ZnS remain unaffected.

Answer: B

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321. Which of the following drugs is an analgesic?

A. Sulpha guanidine

B. Paludrin

C. Analgin

D. All of these

Answer: C

322. The volume percentage of Cl_2 at equilibrium in the dissociation of PCl_5 under a total pressure of 1.5atm is (Kp = 0.202) ,

A. 74.5

B. 36.5

C. 63.5

D. 26.6

Answer: D

323. The conversion : can be effected by

Can be effected by

A. $LiAlH_4$ reduction

B. Clemmensen's reduction

C. $NaBH_4$ reduction

D. H_2/Ni reduction

Answer: C

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324. An organic compound (A) contatns 20% C, 46.66% N and 6.66% H. It gave NH3 gas on heating with NaOH. The organic compound (A) could be

A. CH_3CONH_2

B. $C_6H_5CONH_2$

C. NH_2CONH_2

D. $CH_3NHCONH_2$

Answer: C

325. If the temperature of an ideal gas in a sealed, rigid container is increased to 1.5 times the initial value (in K), the density of gas

    A. becomes 1.5 times the initial value

    B. becomes 2.5 times the initial value

    C. becomes 2.25 times the initial value

    D. remains same

Answer: D

326. The optical rotation of the α-form of a pyranose is $+150.7°$, that of the β-form is $+52.8°$. In solution an equilibrium mixture of these anomers has an optical rotation of $+80.2°$. The precentage of the α-form in equilibrium mixture is :

A. 0.28

B. 0.32

C. 0.68

D. 0.72

Answer: A

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327. Orthoboric acid when heated to red hot gives :
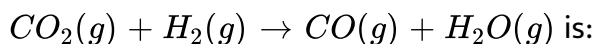
A. metaboric acid

B. pyroboric acid

C. boron and water

D. diboron trioxide

Answer: D

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328. ΔH_f° for $CO_2(g)$ and $H_2O(g)$ are -393.5, -110.5 and $-241.8 kJmol^{-1}$ respectively. The standard enthalpy change (in kJ) for the reaction.

$CO_2(g) + H_2(g) \rightarrow CO(g) + H_2O(g)$ is:

A. 524.1

B. 41.2

C. -262.5

D. -41.2

Answer: B

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329. Which of the following is not an actinoid?

A. Curium (Z=96)

B. Californium (Z=98)

C. Uranium (Z=92)

D. Terbium (Z=65)

Answer: D

330. A chloride dissolves appreciably in cold water. When placed on platinum wire in Bunsen flame, no distinctive colour is noticed, the cation would be

A. Mg^{2+}

B. Ba^{2+}

C. Ag^+

D. Ca^{2+}

Answer: A

331. In the chemical reaction ,

$$CH_3CH_2NH_2 + CHCl_3 + 3KOH \rightarrow (A) + (B) + 3H_2O$$

The compounds (A) and (B) are respectively:

A. C_2H_5NC and K_2CO_3

B. $CH_3CH_2CONH_2$ and $3KCl$

C. C_2H_5CN and 3KCl

D. C_2H_5CN and 3KCl

Answer: D

332. Sodium thiosulphate, $Na_2S_2O_3.5H_2O$ is used in photography to

A. reduce the silver bromide grains to metallic silver

B. convert the metallic silver to silver salt

C. remove undecomposed Ag Br as soluble silver thiosulphate complex

D. remove reduced silver

Answer: C

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333. Some type of gels like gelatin loose water slowly. The process is known as :

A. Synerisis

B. thixotropy

C. peptisation

D. limbition

Answer: A

334. The change in entropy when the pressure of perfect gas is changed isothermally from P_1 to P_2 is
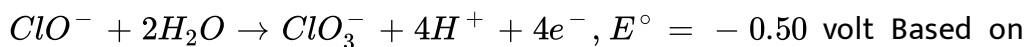
A. $\triangle S = nR\ln(P_1 + P_2)$

B. $\triangle S = nR\ln(P_2 / P_1)$

C. $\triangle S = nR\ln(P_1 / P_2)$

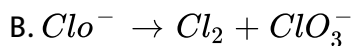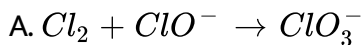D. $\triangle S = nR\ln\left(\dfrac{P_1 + P_2}{P_2}\right)$

Answer: C

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335. Electrode potential data given below

$Cl_2 + 2H_2O \rightarrow 2ClO^- + 4H^+ + 2e^-$, $E^\circ = -1.61$ volt

$ClO^- + 2H_2O \rightarrow ClO_3^- + 4H^+ + 4e^-$, $E^\circ = -0.50$ volt Based on these data which is the spontaneous reaction .

A. $Cl_2 + ClO^- \rightarrow ClO_3^-$

B. $Clo^- \rightarrow Cl_2 + ClO_3^-$

C. $ClO_3^- \rightarrow Cl_2 + ClO^-$

D. $ClO^- + Cl_2 \rightarrow ClO_3^-$
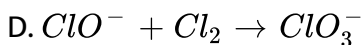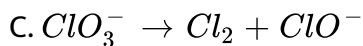
Answer: B

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336. Consider the fallowing statement :

(I) $CH_3OC^{\oplus}H_2$ is more stable that $CH_3CH_2^{\oplus}$

(II) $Me_3C^{\oplus}$ is more stable than $CH_3CH_2C^{\oplus}H_2$

(III) $CH_2 = CH - C^{\oplus}H_2$ is more stable than $CH_3CH_2C^{\oplus}H_2$

(IV) $CH_2 = C^{\oplus}H$ is more stable thn $CH_3C^{\oplus}H_2$ of these statement:
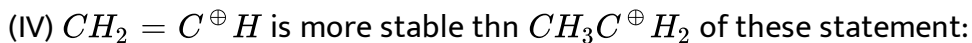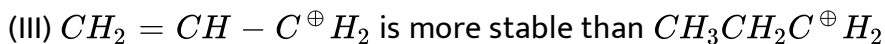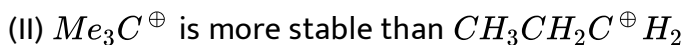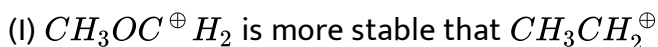
A. I and II are correct

B. III and IV are correct

C. I,II and III are correct

D. All are correct

Answer: C

---

337. Specific conductance of 0.1 MHA is $3.75 \times 10^{-4} ohm^{-1} cm^{-1}$. If λ^{∞} of HA is $250 ohm^{-1} cm^2 mol^{-1}$, then dissociation constant K_a of HA is

A. 1×10^{-5}

B. 2.25×10^{-4}

C. 2.25×10^{-13}

D. 2.25×10^{-13}

Answer: C

338. The major product [P] formed in the following reaction is

A. $+ CH_3—CH_2—OH$

B.

C. $+ CH_3—CH_2—OH$

D.
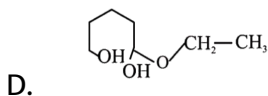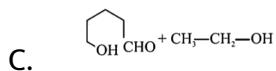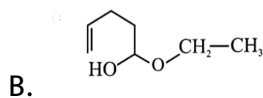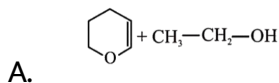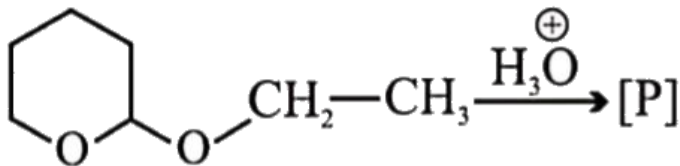
Answer: C

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339. A 0.001 molal aqueous solution of a complex $[MA_8]$ has the freezing point of $-0.0054°C$. If the primary valency of the salt undergoes 100%

ionization and K_f for water $= 1.8$ K molality^{-1} the correct representation of complex is

A. $[MA_8]$

B. $[MA_6]A_2$

C. $[MA_4]A_4$

D. $[MA_5]A_3$

Answer: B

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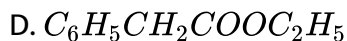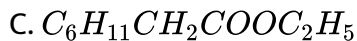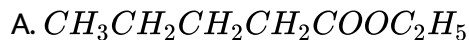**340.** Copper pyrites are concentrated by

A. electromagnetic method

B. gravity method

C. froth floatation process

D. all the above

Answer: C

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341. Which of the following esters cannot undergo Claisen self-condensation

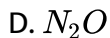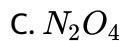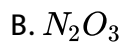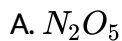A. $CH_3CH_2CH_2CH_2COOC_2H_5$

B. $C_6H_5COOC_2H_5$

C. $C_6H_{11}CH_2COOC_2H_5$

D. $C_6H_5CH_2COOC_2H_5$

Answer: B

---

342. Which of the following oxides of Nitrogen is Neutral

A. N_2O_5

B. N_2O_3

C. N_2O_4

D. N_2O

Answer: D

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343. The strength of $10^{-2} M na_2CO_3$ solution in terms of molality will be

(density of the solution $=1.10 gml^{-1}$)
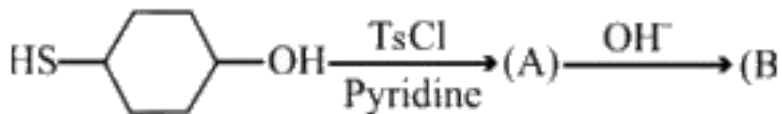
($M. wt Na_2CO_3 = 106$)

A. 9×10^{-3}

B. 1.15×10^{-2}

C. 5.1×10^{-3}

D. 11.2×10^{-3}

Answer: A

344. In the given reaction, what is [B]?

$$HS-\!\!\bigcirc\!\!-OH \xrightarrow[\text{Pyridine}]{\text{TsCl}} (A) \xrightarrow{\text{OH}^-} (B$$

A. $H_3C-\!\!\bigcirc\!\!-OTs$

B. $\overline{S}-\!\!\bigcirc\!\!-OH$
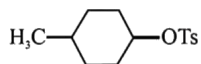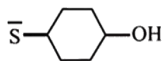
C.

D.

Answer: C

345. The unit cube length for $LiCl$ ($NaCl$ structure) is 5.14Å. Assuming anion-anion contact, calculate the ionic radius for chloride ion.
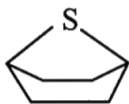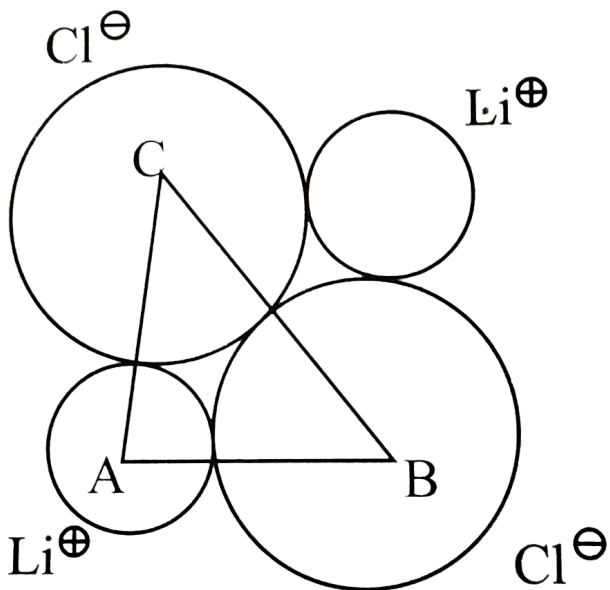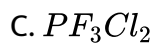

A. 1.815

B. 3.63

C. 2.75

D. 5.14

Answer: A

---

346. Non-polar molecule among the following is

A. SF_4

B. $BF_3 . NH_3$

C. PF_3Cl_2

D. XeF_4

Answer: D

347.

Identify the product

A.

$-C \equiv C - CH, \xrightarrow{-H\,(1\,eq.)}$

HO   OH

B.

HO

$-C \equiv C - CH,$

OH

C.

H—O

$-C \equiv C - CH,$

OH

D.

OH

$-C \equiv C - CH,$

OH
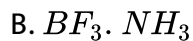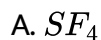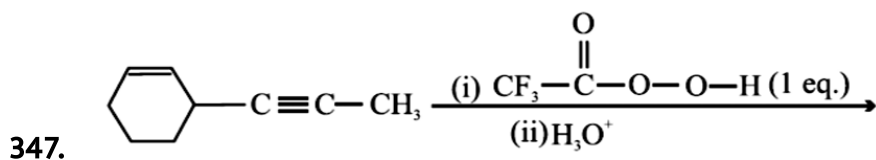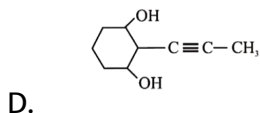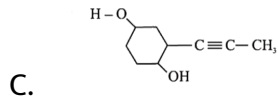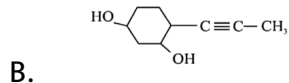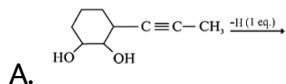
Answer: A

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348. Which of the following chemical equation represents the formation of colloidal solution

A. $Cu + CuCl_2 \rightarrow Cu_2Cl_2$

B. $2Mg + CO_2 \rightarrow 2MgO + C$

C. $2HNO_3 + 3H_2S \rightarrow 3S + 4H_2O + 2NO$
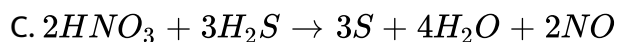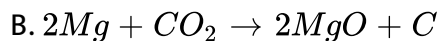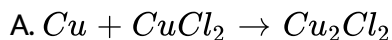
D. Both (B) and (C)

Answer: C

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349. Bond angle in PH_3 si closer to $90°$ while that in NH_3 is $104.5°$. Which of the following best explains this structural feature?

A. Due to larger size of the lone pair electron cloud, there is larger lone pair - bond pair repulsion in PH_3 compared to NH_3

B. Higher electronegativity of nitrogen concentrates the bond pair electron cloud near the central atom which increases the bond pair - bond pair repulsion which in turn decreases the bond angle in NH_3

C. Energy difference between 3s an,d 3p orbitals is quite high and hence the lone pair on phosphorous prefers to occupy

unhybridized s- orbital rather than hybridized sp^3 hydridized orbital which causes its s-orbital energy to increase.

D. Phosphorous forms $p\pi - d\pi$ bonds while nitrogen does not.

Answer: C

350. In a reaction carried out at 400K, 0.01% of the total number of collisions is effective. The energy of activation of the reaction is

A. 13.3 kJ/mol

B. 23.5kJ/mol

C. 3.2kJ/mol

D. 30.6kJ/mol

Answer: D

351. For a certain atom, there are energy levels A, B, C corresponds to energy values $E_A < E_B < E_C$

Choose the correct option if $\lambda_1, \lambda_2, \lambda_3$ are the wave length of radiations corresponding to the transition from C to B, B to A and C to A respectively. .

A. $\lambda_3 = \lambda_1 + \lambda_2$

B. $\lambda_3 = \dfrac{\lambda_1 \lambda_2}{\lambda_1 + \lambda_2}$

C. $\lambda_1 + \lambda_2 + \lambda_3 = 0$

D. $3\lambda_3 = \lambda_3 + 2\lambda_2$

Answer: B

352. A crystal is made up of particles X, Y, and Z. X forms f packing. Y occupies all octahedral voids of X and Z occupies all tetrahedral voids of

X. If all the particles along one body diagonal are removed. Then the formula of the crystal would be

A. XYZ_2

B. X_2YZ_2

C. $X_8Y_4Z_5$

D. $X_5Y_4Z_8$

Answer: D

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353. Identify the option which represents the correct products of the following reaction,

$$PhCHO + CH_3CHO \xrightarrow{OH^-} \text{(Aldols)}$$

(I)

$$\text{Ph}-\text{CH}-\text{CH}_2-\text{CHO}$$
$$\overset{|}{\text{OH}}$$

(II) $PhCH_2 - COPh$

(III)

$$\overset{\text{OH}}{\overset{|}{\text{CH}_3-\text{CH}-\text{CH}_2\text{CHO}}}$$

(IV)

$$\overset{\text{OH}\quad\text{O}}{\overset{|\quad\;\;||}{\text{CH}_3-\text{CH}-\text{C}-\text{Ph}}}$$
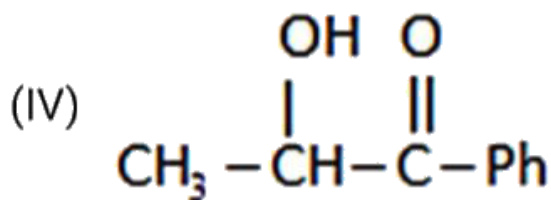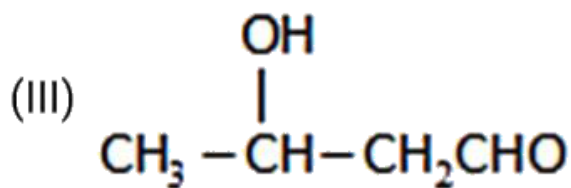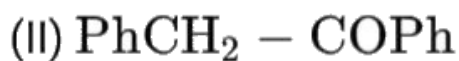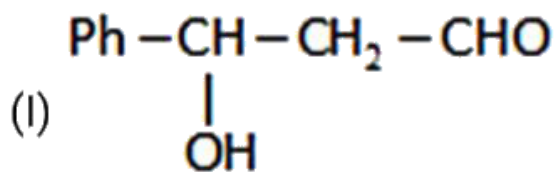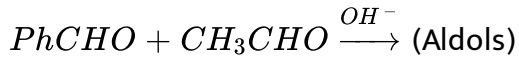
A. I,II

B. I,III

C. II,III

D. I,III,IV

Answer: B

354. By which of the following method, H_2O_2 cannot be synthesised?

A. Addition of H_2SO_4 on BaO_2

B. Addition of H_2SO_4 on PbO_2

C. Aerial oxidation of 2-ethyl anthraquinol

D. Electrolysis of $(NH_4)_2SO_4$ at a high current density.

Answer: B

355. One mole of a non-ideal gas undergoes a change of state (2.0atm, 3.01L, 95K) $\rightarrow$ (4atm,5L,245K) with a change in interanl energy, $\triangle U = 30.0 Latm$. The change in enthalpy, $\triangle H$, of the process in L atm is

A. 40

B. 42.3

C. 44

D. 1

Answer: C

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356.

$$\xrightarrow[\text{2) H}^+/\text{H}_2\text{O}]{\text{1) CH}_3\text{MgBr}} \quad \text{Product}$$

Product is

A.

B.

C.

D.
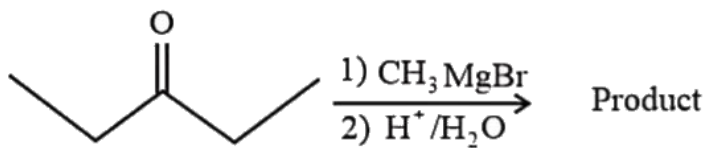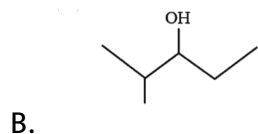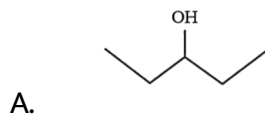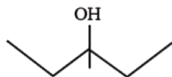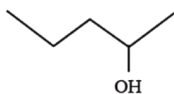
Answer: B

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357. Which of the following metal is expected to have the highest third ionisation enthalpy?

A. Cr(Z=24)

B. V(Z=23)

C. Mn(Z=25)

D. Fe(Z=26)

Answer: C

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358. The anomeric carbon in D(+) glucose is

   A. C-1 carbon

   B. C-2 carbon

   C. C-5 carbon

   D. C-6 carbon

Answer: A

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359. Correct sequence for reactivity of acid derivative is

(1) $(RCO)_2O$

(2) RCOCl

(3) RCOOR

(4) RCONH_2

A. 2gt1gt3gt4

B. 1gt2gt3gt4

C. 2gt1gt4gt3

D. 1gt3gt2gt4

Answer: A

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360. pH of a $10^{-10}MNaOH$ is nearest to

A. 10

B. 7

C. 4

D. 10.9

Answer: B

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1. A tetra-atomic molecule (A) on reaction with nitrogen (I) oxide, produces two substances (B) and (C). (B) is a dehydrating agent while substance (C) is a diatomic gas which shows almost inert behaviour. The substances (A),(B) and (C) are

A. P_4, N_2O_5, O_2

B. P_4, P_4O_{10}, Ar

C. P_4, P_2O_3, O_2

D. P_4, P_4O_{10}, N_2
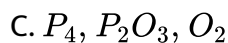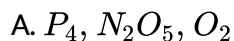
Answer: D

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2. Arrange the following structure according to their increasing order order of acidic behaviour in polar solvent.

(i)   OH on benzene ring

(ii)   OH on benzene ring with F (para)

(iii)   OH on benzene ring with Cl (para)

(iv)   OH on benzene ring with Br (para)

OH

(v)

I
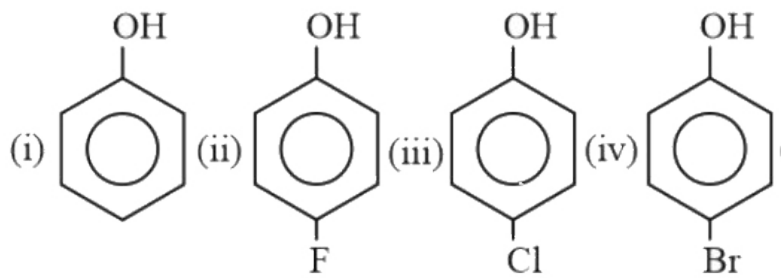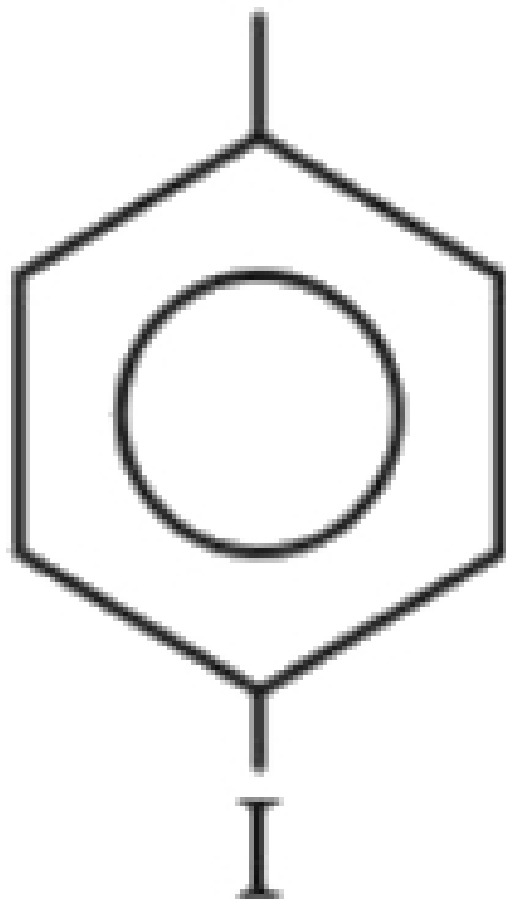
A. $i < iv < v < ii < iii$

B. $i < v < iv < iii < ii$

C. $i < v < iv < ii < iii$

D. $ii < v < iv < iii < i$

Answer: C

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3. A 0.016 M of an acid solution in benzene is dropped on a water surface, the benzene evaporates and the aci forms a monomolecular film of solid type. What volume of the above solution would be required to cover a 500 surface area of water with monomolecular layer of acid? Area covered by single acid molecule is 0.2

A. $24.94 \times 10^{-3} ml$

B. $25.94 \times 10^{-3} ml$

C. $3.67 \times 10^{-3} ml$

D. $20.78 \times 10^6 ml$

Answer: B

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4. Marsh gas mainly contains:

A. C_2H_2

B. CH_4

C. H_2S

D. CO

Answer: B

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5. $CH_3COCl + H_2 \xrightarrow[\text{Quinoline}]{Pd\,/\,BaSO_4}$
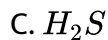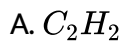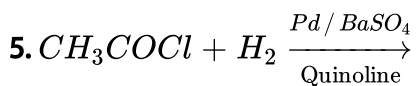
A. Acetaldehyde

B. Propionaldehyde

C. acetone

D. acetic anhydride

Answer: A

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6. For the gaseous reaction, $C_2H_4 + H_2 \Leftrightarrow C_2H_6, \Delta H = -130 kJmol^{-1}$ carried in a closed vessel, the equilibrium concentration of the C_2H_6 can definitely be increased by

A. increasing temperature and decreasing pressure

B. decreasing temperature and increasing pressure

C. increasing temperature and pressure both

D. Decreasing temperature and pressure both

Answer: B

7. Amoxillin is semi-syntheitc modification of :

A. penicillin

B. streptomycin

C. tetracycline

D. chloramphenicol

Answer: A

8. In how many of the following molecules, all atoms are in same plane?

ClF_3	H_2O	PCl_3	BF_3
SF_4	H_2S	OCl_2	SO_3
XeF_6	NH_3	C_6H_6	XeF_2
XeF_4	PCl_5	I_2Cl_6	PH_3

A. 12

B. 0

C. 10

D. 11

Answer: C

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9. The properties of the elements are the periodic function of their atomic number. The statement is given by-

A. N. Bohr

B. J.W. Dobereiner

C. D.I. Mendeleev

D. H.G.J. Moseley

Answer: D

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10. In the estimation of sulphur organic compound on treating with conc. HNO_3 is converted to

A. SO_2

B. H_2S

C. H_2SO_4

Answer: C

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11. Calculate the number of atoms in each of the following (i) 52 moles of Ar (ii) 52 u of He (iii) 52 g of He.

A. 3.130×10^{23}, 12, 6.8284×10^{20}

B. 3.138×10^{22}, 12, 6.7854×10^{28}

C. 3.131×10^{25}, 13, 7.8286×10^{24}

D. 3.135×10^{28}, 15, 6.7288×10^{20}

Answer: C

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12. The predominant product formed when $3-$ methyl $-2-$ pentene reacts with $HOCl$ is

A. $CH_3CH_2 - \overset{\overset{\displaystyle Cl}{|}}{\underset{\underset{\displaystyle CH_3}{|}}{C}} - CH(OH)CH_3$

B. $CH_3 - \overset{\overset{\displaystyle CH_3}{|}}{\underset{\underset{\displaystyle CH_3}{|}}{C}} - \overset{}{\underset{\underset{\displaystyle OH}{|}}{C}H} - CH_3$

C. $CH_3CH_2 - \overset{\overset{\displaystyle OH}{|}}{\underset{\underset{\displaystyle CH_3}{|}}{C}} - \overset{}{\underset{\underset{\displaystyle Cl}{|}}{C}H} - CH_3$

D. $CH_3 - \overset{\overset{\displaystyle CH_3}{|}}{\underset{\underset{\displaystyle CH_3}{|}}{C}} - \overset{}{\underset{\underset{\displaystyle OH}{|}}{C}H} - CH_3\backslash$
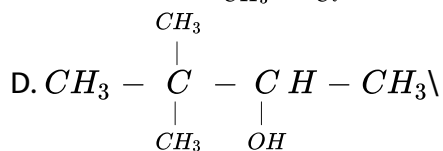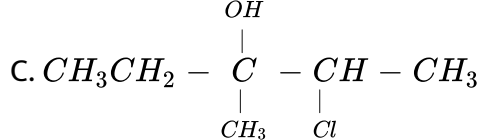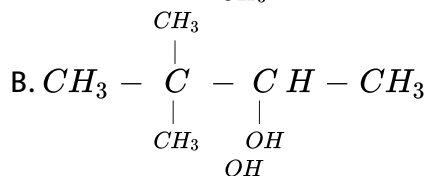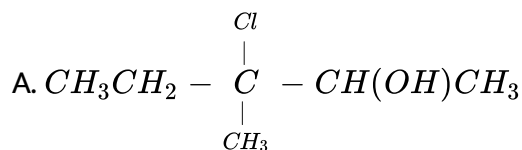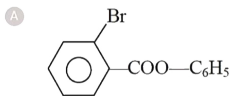
Answer: C

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13. The major product formed on monobromination of phenylbenzoate is

:

A.

B.

C.

D.
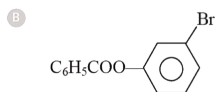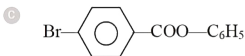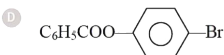
Answer: D

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14. By adding inert gas at a constant volume, which of the following equilibrium will not be affected?

A. $H_2(g) + I_2(g) \Leftrightarrow 2HI(g)$

B. $3H_2(g) + N_2(G) \Leftrightarrow 2NH_3(g)$

C. $PCl_5(g) \Leftrightarrow PCl_3(g) + Cl_2(g)$
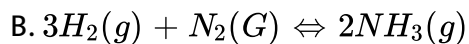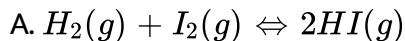
D. All of above

Answer: D

15. For an exothermic chemical process ocuuring in two process occuring in two steps as follows

$(i) A + B \rightarrow X(\text{slow})$ $\qquad$ $(ii) X \rightarrow AB(\text{fast})$

The progress of reaction can be best described by :

A.

(a)

B.

(b)

C.

(c)

D.
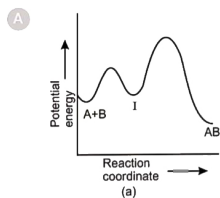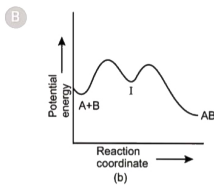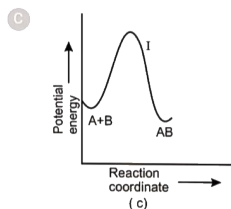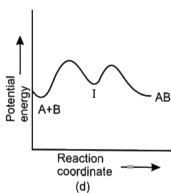
Answer: B

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16. The gas evolved on heating CH_3MgBr in methanol is :

A. Methane

B. Ethane

C. Propane

D. HBr

Answer: A

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17. Acetonitrile on reduction gives

    A. Propanamine

    B. Methanamine

    C. Ethanamine

    D. Propane nitrile

Answer: C

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18. For the closest packing of atoms A (radius, r_A), the maximum radius of atom B that can be fitted into octahedral void is

    A. 0.155 r_A

    B. 0.125 r_A

    C. 0.414 r_A

    D. 0.732 r_A

Answer: D

19. Arrange in the order of stability of enol form of the compounds:

i.

ii.

iii.
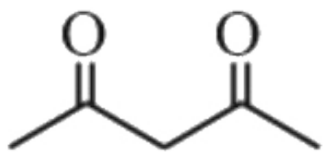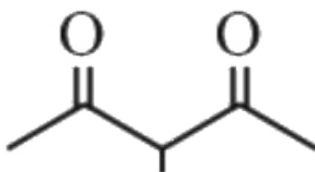
A. $iii > ii > i$

B. $i > ii > iii$

C. $ii > i > iii$

D. $ii > iii > i$

Answer: B

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20. Among the following sets of bases, which set of bases is present both in DNA and RNA?

    A. Adenine, uracil, thymine

    B. Adenine, guanine, cytosine

    C. Adenine, guanine, uracil

    D. Adenine, guanine, thymine

Answer: B

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21. Consider the reaction :

$$Cr_2O_7^{2-} + 14H^+ + 6e^- \rightarrow 2Cr^{3+} + 7H_2O$$
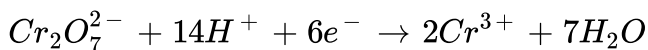
What is the quantity of electricity in coulombs needed to reduce 1 mole of $Cr_2O_7^{2-}$ ions ?

    A. 5.79×10^5

B. 5.69×10^5

C. 5.59×10^5

D. 5.49×10^5

Answer: A

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22. Which of the following octahedral complex does not show geometrical isomerism (A and B are monodentate ligands) ?

A. $[MA_4B_2]$

B. $[MA_5B]$

C. $[MA_2B_4]$

D. $[MA_3B_3]$
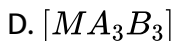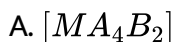
Answer: B

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23. Identify the correct statement about borazene, $B_3N_3B_6$.

(i) Borazene is aromatic

(ii) There are four isomers of bi substituted molecule of borazene molecules, $(B_3N_3H_4X_2)$.

(iii) Borazene is more reactive towards addition reactions that benzene.

    A. only (i)

    B. (i) and (ii)

    C. (i) and (iii)

    D. (i),(ii) and (iii)

Answer: D

24. When $CH_2 = CH - COOH$ is reduced with $LiAlH_4$ the compound obtained will be

A. $CH_3 - CH_2 - COOH$

B. $CH_2 = CH - CH_2OH$

C. $CH_3 - CH_2 - CH_2OH$

D. $CH_3 - CH_2 - CHO$
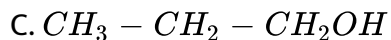
Answer: B

25. The starting material used in Solvay's process are

A. Sodium sulphate

B. Brine solution

C. Carnallite

D. All of these

Answer: B

26. Compound (P) forms a precipitate with $AgNO_3$. The precipitate dissolves in excess reagent (P). (P) cannot be:

A. KOH

B. KCN

C. $Na_2S_2O_3$

D. NH_3

Answer: A

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27. Addition of sodium hydroxide solution to a weak acid (HA) results in a buffer of pH 6. if ionization constant of HA is 10^{-5}, the ratio of salt to acid concentration in the buffer solution will be:

A. $10:1$

B. $4:5$

C. $5:4$

D. $1:10$

Answer: A

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28. The wave character of moving electron was experimentally verified by :

A. de Broglie

B. Davisson and Germer

C. N. Bohr

D. Schrodinger

Answer: B

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29. The ability of ion to bring about coagulation of a given collidal solution depends upon

    A. its size

    B. the magnitude of its charge only

    C. the sign of its charge

    D. both the magnitude and the sign of its charge

Answer: D

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30. δU is equal to

    A. Isobaric work

    B. Adiabatic work

    C. Isothermal work

    D. Isochoric work

Answer: B

---

31. Sodium extract is heated with con. HNO_3 before testing for halogens

because

A. Ag_2S and $AgCN$ are soluble in acidic medium.

B. Silver halides are totally insoluble in nitric acid.

C. S^{2-} and CN^-, if present, are decomposed by conc. HNO_3 and

hence do not interfere in the test.

D. Ag reacts faster with halides in acidic medium

Answer: C

32. What amount of bromine will be required to convert $2g$ of phenol into

$2, 4, 6 -$ tribromphenol

    A. 4.00

    B. 6.00

    C. 10.22

    D. 20.44

Answer: C

33. For the decompoistion of HI at $1000K(2HI \rightarrow H_2 + I_2)$, following

data were obtained:

$[HI](M)$	Rate of decomposition of $HI(molL^{-1}s^{-1})$
0.1	2.75×10^{-8}
0.2	11×10^{-8}
0.3	24.75×10^{-8}

The order of reaction is

A. 1

B. 2

C. 0

D. 1.5

Answer: B

34. Molecular weight of oxalic acid is 126. the weight of oxalic acid required to neutralise 100cc of normal solution of NaOH is

A. 6.3 gm

B. 126 gm

C. 530 gm

D. 63 gm

Answer: A

35. The energy of second Bohr orbit of the hydrogen atom is $-328kJmol^{-1}$, hence the energy of fourth Bohr orbit would be.

A. $-41kJ \quad mol^{-1}$

B. $-1312 \ \text{kJ} \ mol^{-1}$

C. $-164 \ \text{kJ} \ mol^{-1}$

D. $-82 \ \text{kJ} \ mol^{-1}$

Answer: D

36. The resistance of $1N$ solution of acetic acid is $250 ohm$, when measured in a cell of cell constant $1.15cm^{-1}$. The equivalent conductance (in $ohm^{-1}cm^2eq^{-1}$) of $1N$ acetic acid is
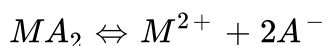
A. 18.4

B. 9.2

C. 4.6

D. 2.3

Answer: C

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37. A salt MA_2 ionises as

$$MA_2 \Leftrightarrow M^{2+} + 2A^-$$

It was found that a given solution of the salt had the same freezing point

as solution of glucose of twice the molality. The apparent degree of
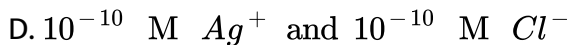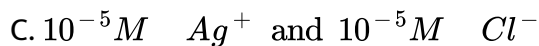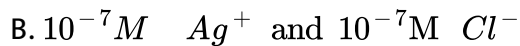
ionization of the salt is
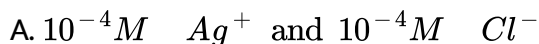
A. 0.25

B. 0.33

C. 0.5

D. 0.67

Answer: C

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38. The solubility product of AgCl is 1.8×10^{-10}. Precipitation of AgCl will occur only when equal volumes of solutions of :

A. $10^{-4} M \quad Ag^+$ and $10^{-4} M \quad Cl^-$

B. $10^{-7} M \quad Ag^+$ and $10^{-7} \mathrm{M} \; Cl^-$

C. $10^{-5} M \quad Ag^+$ and $10^{-5} M \quad Cl^-$

D. $10^{-10} \; \mathrm{M} \; Ag^+$ and $10^{-10} \; \mathrm{M} \; Cl^-$

Answer: A

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39. The important step in the extraction of metal from carbonate ore is

A. Calcination

B. Roasting

C. Electro-reduction

D. Cupellation

Answer: A

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40. Which substance would give a solution with a boiling point below that of pure wate rrather than above?

A. Sodium chloride (solid)

B. Ethyl alcohol (liquid, b.p. $61°C$)

C. sulphuric acid (liquid, b.p.gt$300°C$)

D. sucrose sugar (solid)

Answer: B

---

41. In van der Waals equation of state for a non-ideal gas , the term that accounts for intermolecular forces is

A. $V_m - b$

B. $P + \dfrac{a}{V_m^2}$

C. RT

D. 1/RT

Answer: B

---

42. Which of the following properties don't help in differentitating, different hydrated isomers of $CrCl_3.6H_2O$?

A. Conductivity measurement

B. Precipitation by $AgNO_3$

C. Dipole moment

D. Magnetic moment

Answer: D

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43. If 200mL of He at 0.66 atm and 400 mL of O_2 at 0.52 atm pressure are raised in 400 mL vessel at $20°C$ then find the partial pressures of He and O_2 ?
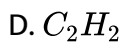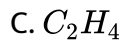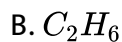
A. 0.33 and 0.55

B. 0.33 and 0.52

C. 0.38 and 0.52

D. 0.25 and 0.45

Answer: B

44. A metallic carbide on treatment with water gives a coulouless gas which burns readily in air and gives a precipitate with ammonical silver nitrate. The gas is

A. CH_4

B. C_2H_6

C. C_2H_4

D. C_2H_2

Answer: D

45. The natural rubber is the polymer of

A. 1,3-butadiene

B. Polyamide

C. Isoprene

D. None of these.

Answer: C