

CHEMISTRY

Test Series for NEET Students

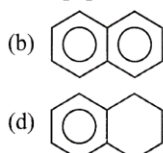
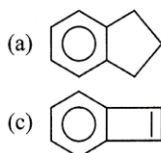
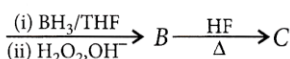
Test No. : 03/24

By Khare Sir

SECTION - A

- 1 Propan-1-ol and propan-2-ol can be best distinguished by
 (a) oxidation with alkaline KMnO_4 followed by reaction with Fehling's solution
 (b) oxidation with acidic dichromate followed by reaction with Fehling's solution
 (c) oxidation by heating copper with acidic dichromate solution followed by reaction with Fehling's solution
 (d) oxidation with concentrated H_2SO_4 followed by reaction with Fehling's solution.

- 2 Identify the compound 'C' in the following sequence of reactions
 $\text{C}_6\text{H}_6 + \text{CH}_2 = \text{CHCH}_2\text{CH}_2\text{Cl} \xrightarrow{\text{AlCl}_3} \text{A}$



- 3 The bond length of HCl bond is 2.29×10^{-10} m. The percentage ionic character of HCl, if measured dipole moment is 6.226×10^{-30} C m, is
 (a) 8% (b) 20% (c) 17% (d) 50%

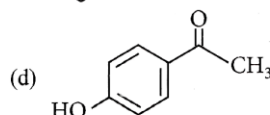
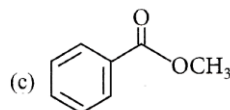
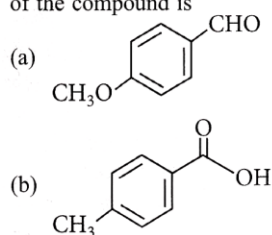
- 4 A compound that gives a positive iodoform test is
 (a) 1-pentanol (b) 2-pentanone
 (c) 3-pentanone (d) pentanal

- 5 Reaction of ethyl formate with excess of CH_3MgI followed by hydrolysis gives
 (a) *n*-propyl alcohol (b) isopropyl alcohol
 (c) acetaldehyde (d) acetone.

- 6 An organic compound containing C, H and N have the percentage 40, 13.33 and 46.67 respectively. Its empirical formula may be
 (a) $\text{C}_2\text{H}_7\text{N}_2$ (b) CH_5N
 (c) CH_4N (d) $\text{C}_2\text{H}_7\text{N}$

- 7 Chemically borax is
 (a) sodium metaborate
 (b) sodium orthoborate
 (c) boric anhydride
 (d) sodium tetraborate decahydrate.

- 8 A compound of molecular formula $\text{C}_8\text{H}_8\text{O}_2$ reacts with acetophenone to form a single cross-aldol product in the presence of base. The same compound on reaction with conc. NaOH forms benzyl alcohol as one of the products. The structure of the compound is



- 9 For a concentrated solution of a weak electrolyte A_xB_y of concentration C , the degree of dissociation α is given as

- (a) $\alpha = \sqrt{K_{eq} / C(x+y)}$
 (b) $\alpha = \sqrt{K_{eq}C / (xy)}$
 (c) $\alpha = (K_{eq} / C^{x+y-1}x^xy^y)^{1/(x+y)}$
 (d) $\alpha = (K_{eq} / Cxy)$

- 10 Given below are two statements :

Statement I : Methyl orange is a weak acid.

Statement II : The benzenoid form of methyl orange is more intense/deeply coloured than the quinonoid form.

In the light of the above statements, choose the most appropriate answer from the options given below.

- (a) Both Statement I and Statement II are incorrect.
 (b) Both Statement I and Statement II are correct.
 (c) Statement I is incorrect but Statement II is correct.
 (d) Statement I is correct but Statement II is incorrect.

- 11 Which one of the following when dissolved in water gives coloured solution in nitrogen atmosphere?

- (a) Cu_2Cl_2 (b) ZnCl_2 (c) CuCl_2 (d) AgCl

- 12 Which of the following major products is formed when 2-bromobutane is treated with alcoholic KOH?

- (a) 2-Butanol (b) 1-Butene
 (c) 1-Butanol (d) *trans*-2-butene

- 13 Compound formed by electrolysis of a mixture of ethanol and NaCl?

- (a) ethyl chloride (b) carbon tetrachloride
 (c) chlorine (d) chloroform.

- 14 Which of the following oxyacids of phosphorus is a reducing agent and monobasic?

- (a) H_3PO_4 (b) H_3PO_3
 (c) H_3PO_2 (d) $\text{H}_4\text{P}_2\text{O}_6$

- 15 Match the column I with column II and mark the appropriate choice.

Column I	Column II
(A) $\text{Fe}(\text{OH})_3$	(i) $K_{sp} = s^2$
(B) Ag_2CrO_4	(ii) $K_{sp} = 27s^4$
(C) CH_3COOAg	(iii) $K_{sp} = 108s^5$
(D) $\text{Ca}_3(\text{PO}_4)_2$	(iv) $K_{sp} = 4s^3$

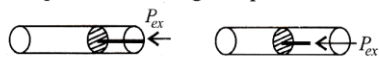
- (a) (A) \rightarrow (iii), (B) \rightarrow (ii), (C) \rightarrow (iv), (D) \rightarrow (i)
 (b) (A) \rightarrow (ii), (B) \rightarrow (iv), (C) \rightarrow (i), (D) \rightarrow (iii)
 (c) (A) \rightarrow (i), (B) \rightarrow (iii), (C) \rightarrow (ii), (D) \rightarrow (iv)
 (d) (A) \rightarrow (iv), (B) \rightarrow (i), (C) \rightarrow (iii), (D) \rightarrow (ii)

- 16 An unsaturated hydrocarbon was treated with ozone and resulting ozonide on hydrolysis gives 2-pentanone and acetaldehyde. What is the structure of alkene?
- (a) $C_3H_7 - CH = CH - CH_3$
- (b)
- (c)
- (d)
- 17 The change in entropy for the fusion of 1 mol of ice is [melting point of ice = 273 K, molar enthalpy of fusion for ice = 6.0 kJ mol⁻¹]
- (a) 11.73 J K⁻¹ mol⁻¹ (b) 18.85 J K⁻¹ mol⁻¹
(c) 21.97 J K⁻¹ mol⁻¹ (d) 24.47 J K⁻¹ mol⁻¹
- 18 The standard electrode potential (M^{3+}/M^{2+}) for V, Cr, Mn and Co are -0.26 V, -0.41 V, +1.57 V and +1.97 V respectively. The metal ions which can liberate H₂ from a dilute acid are
- (a) V²⁺ and Mn²⁺ (b) Mn²⁺ and Co²⁺
(c) Cr²⁺ and Co²⁺ (d) V²⁺ and Cr²⁺
- 19 In a reaction,
 $4P + 3KOH + 3H_2O \rightarrow 3KH_2PO_2 + PH_3$
 Phosphorus is
- (a) reduced
(b) oxidised
(c) neither reduced nor oxidised
(d) both reduced and oxidised.
- 20 In the following sequence of the reactions, identify the final product (D).
- $CH_3 - Mg - Br +$ $\xrightarrow{H_3O^+} A \xrightarrow{HBr} B \xrightarrow{Mg, ether} C \xrightarrow[CH_3CHO]{H_3O^+} D$
- (a)
- (b)
- (c)
- (d)
- 21 Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R).
Assertion (A) : Cu²⁺ in water is more stable than Cu⁺.
Reason (R) : Enthalpy of hydration for Cu²⁺ is much less than that of Cu⁺.
 In the light of the above statements, choose the correct answer from the options given below :
- (a) Both (A) and (R) are correct and (R) is the correct explanation of (A).
(b) (A) is correct but (R) is not correct.
(c) Both (A) and (R) are correct but (R) is not the correct explanation of (A).
(d) (A) is not correct but (R) is correct.
- 22 The correct structure of Fe(CO)₅ is (at. no. of Fe = 26)
- (a) trigonal bipyramidal (b) octahedral
(c) tetrahedral (d) square pyramidal.
- 23 A binary liquid solution is prepared by mixing *n*-heptane and ethanol. Which one of the following statements is correct regarding the behaviour of the solution?
- (a) The solution formed is an ideal solution.
(b) The solution is non-ideal, showing +ve deviation from Raoult's law.
(c) The solution is non-ideal, showing -ve deviation from Raoult's law.
(d) *n*-heptane shows +ve deviation while ethanol shows -ve deviation from Raoult's law.
- 24 Uncertainty in position of an electron (mass = 9.1 × 10⁻²⁸ g) moving with a velocity of 3 × 10⁴ cm/s accurate upto 0.001% will be (use $h/4\pi$ in uncertainty expression where $h = 6.626 \times 10^{-27}$ erg s)
- (a) 5.76 cm (b) 7.68 cm (c) 1.93 cm (d) 3.84 cm
- 25 The rate law of a chemical reaction,
 $2NO_{(g)} + O_{2(g)} \rightarrow 2NO_{2(g)}$
 is given as rate = $k [NO]^2 [O_2]$. If the volume of reaction vessel is increased four times its initial volume, then rate of reaction
- (a) becomes $\frac{1}{64}$ th of initial rate
(b) becomes $\frac{1}{4}$ th of initial rate
(c) becomes $\frac{1}{16}$ th of initial rate
(d) becomes 4 times of initial rate.
- 26 The equilibrium constant of the following redox reaction at 298 K is 1 × 10⁸ :
- $$2Fe^{3+}_{(aq)} + 2I^-_{(aq)} \rightleftharpoons 2Fe^{2+}_{(aq)} + I_{2(s)}$$
- If the standard reduction potential of iodine becoming iodide is +0.54 V, what is the standard reduction potential of Fe³⁺/Fe²⁺?
- (a) +1.006 V (b) -1.006 V
(c) +0.77 V (d) -0.77 V
- 27 **Statement-1** : For every chemical reaction at equilibrium, standard Gibbs energy of reaction is zero.
Statement-2 : At constant temperature and pressure, chemical reactions are spontaneous in the direction of decreasing Gibbs energy.
- (a) Statements-1 and 2 are true and statement-2 is a correct explanation for statement-1.
(b) Statements-1 and 2 are true and statement-2 is not a correct explanation for statement-1.
(c) Statement-1 is true, statement-2 is false.
(d) Statement-1 is false, statement-2 is true.
- 28 In the 3rd period, the first ionisation potential is of the order
- (a) Na > Mg > Al > Si > P (b) Mg > Na > Si > P > Al
(c) Na < Mg < Al < Si < P (d) Na < Al < Mg < Si < P
- 29 The ionic radii of Group-12 metals Zn, Cd and Hg are smaller than those of Group-2 metals because Zn, Cd and Hg have
- (a) 10 *d*-electrons which shield the nuclear charge poorly
(b) 10 *d*-electrons which shield the nuclear charge strongly
(c) 10 *d*-electrons which have a large radius ratio
(d) 10 *d*-electrons which have a large exchange energy.
- 30 The enzyme which can catalyse the conversion of maltose to glucose is
- (a) zymase (b) invertase (c) maltase (d) diastase.

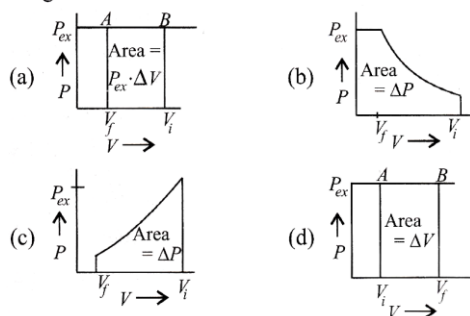
- 31 In the reaction : $A_{2(g)} + 3B_{2(g)} \rightarrow 2AB_{3(g)}$ the standard entropies (in $\text{J K}^{-1} \text{mol}^{-1}$) of $A_{2(g)}$, $B_{2(g)}$ and $AB_{3(g)}$ are respectively 190, 130 and 195 and the standard enthalpy change for the reaction is -95 kJ mol^{-1} . The temperature (in K) at which the reaction attains equilibrium is
 (a) 500 (b) 400 (c) 300 (d) 600

- 32 Which of the following compounds does not leave residue on heating?
 (a) Lead nitrate (b) Ammonium nitrate
 (c) Silver nitrate (d) Sodium nitrate

- 33 Work done on an ideal gas in a cylinder when it is compressed by an external pressure in a single step is shown below.



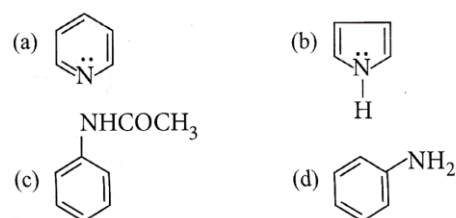
Which of the following graphs will show the work done on the gas?



- 34 For the redox reaction,
 $\text{MnO}_4^- + \text{C}_2\text{O}_4^{2-} + \text{H}^+ \rightarrow \text{Mn}^{2+} + \text{CO}_2 + \text{H}_2\text{O}$
 the correct coefficient of the reactants for the balanced reaction are

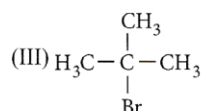
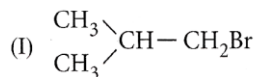
MnO_4^-	$\text{C}_2\text{O}_4^{2-}$	H^+
(a) 2	5	16
(b) 16	3	12
(c) 15	16	12
(d) 2	16	5

- 35 Which one of the following has the most nucleophilic nitrogen?



Section-B

- 36 As a result of dissolution of NaCl in water, the entropy
 (a) increases (b) decreases
 (c) remains unchanged (d) becomes zero.
- 37 Ammonia is a Lewis base and it forms complexes with many cations. Which one of the following cations does not form a complex with ammonia?
 (a) Ag^+ (b) Cu^{2+} (c) Cd^{2+} (d) Pb^{2+}
- 38 Haemoglobin contains 0.334% of iron by weight. The molecular weight of haemoglobin is approximately 67200 g. The number of iron atoms (Atomic weight of Fe is 56.) present in one molecule of haemoglobin is
 (a) 1 (b) 2 (c) 4 (d) 6
- 39 Arrange the following compounds in increasing order of their boiling points.



- (a) (II) < (I) < (III) (b) (I) < (II) < (III)
 (c) (III) < (I) < (II) (d) (III) < (II) < (I)

- 40 $[A] \xleftarrow[\text{catalyst}]{\text{Lindlar's}} \text{CH}_3-\text{C} \equiv \text{C}-\text{CH}_3 \xrightarrow[\text{liq. NH}_3]{\text{Na in}} [B]$

[A] and [B] are respectively

- (a) *cis*, *trans*-2-butene (b) both *trans*-2-butene
 (c) *trans*-*cis*-2-butene (d) both *cis*-2-butene.

- 41 For the Balmer series in the spectrum of H-atom,

$$\bar{\nu} = R_H \left\{ \frac{1}{n_1^2} - \frac{1}{n_2^2} \right\}, \text{ the correct statements among (I) to (IV) are}$$

- (I) as wavelength decreases, the lines in the series converge
 (II) the integer n_1 is equal to 2
 (III) the lines of longest wavelength corresponds to $n_2 = 3$
 (IV) the ionization energy of hydrogen can be calculated from wave number of these lines.

- (a) (II), (III), (IV) (b) (I), (III), (IV)
 (c) (I), (II), (III) (d) (I), (II), (IV)

- 42 When first ionization energy is plotted against the atomic number, the peaks in curve are occupied by

- (a) halogens (b) rare gases
 (c) alkali metals (d) transition elements.

- 43 The most stable compound is

- (a) LiF (b) LiCl (c) LiBr (d) LiI

- 44 Ge(II) compounds are powerful reducing agents whereas Pb(IV) compounds are strong oxidants. This can be due to

- (a) Pb is more electropositive than Ge
 (b) ionization potential of lead is less than that of Ge
 (c) ionic radii of Pb^{2+} and Pb^{4+} are larger than those of Ge^{2+} and Ge^{4+}
 (d) more pronounced inert pair effect in lead than in Ge.

- 45 For a chemical reaction at 27°C , the activation energy is $600 R$. The ratio of the rate constant at 327°C to that at 27°C will be
 (a) 2 (b) 40 (c) e (d) e^2
- 46 The set of numerical coefficients that balances the equation $\text{K}_2\text{CrO}_4 + \text{HCl} \rightarrow \text{K}_2\text{Cr}_2\text{O}_7 + \text{KCl} + \text{H}_2\text{O}$ is
 (a) 1, 1, 2, 2, 1 (b) 2, 2, 1, 1, 1
 (c) 2, 1, 1, 2, 1 (d) 2, 2, 1, 2, 1
- 47 In which of the following complex ion, the central metal ion is in a state of sp^3d^2 hybridisation?
 (a) $[\text{CoF}_6]^{3-}$ (b) $[\text{Co}(\text{NH}_3)_6]^{3+}$
 (c) $[\text{Fe}(\text{CN})_6]^{3-}$ (d) $[\text{Cr}(\text{NH}_3)_6]^{3+}$
- 48 **Statement-I** : During flame test of basic radicals few drops of $\text{HCl}(\text{conc.})$ are added to salt.
Statement II : With HCl metal salts are converted to metal chlorides which are more volatile.
 (a) Statement I and II, both are correct but II is not correct explanation of I.
 (b) Statement I and II, both are incorrect.
 (c) Statement I and II, both are correct and II is correct explanation for I.
 (d) Statement I is correct but statement II is false.
- 49 Which of the following reactions does not yield an amine?
 (a) $R-X + \text{NH}_3 \longrightarrow$
 (b) $R-\text{CH}=\text{NOH} + [\text{H}] \xrightarrow{\text{Na}} \text{C}_2\text{H}_5\text{OH}$
 (c) $R-\text{CN} + \text{H}_2\text{O} \xrightarrow{\text{H}^+}$
 (d) $R-\text{CONH}_2 + 4[\text{H}] \xrightarrow{\text{LiAlH}_4}$
- 50 In a reaction $2X \rightarrow Y$, the concentration of X decreases from 3.0 moles/litre to 2.0 moles/litre in 5 minutes. The rate of reaction is
 (a) $0.1 \text{ mol L}^{-1} \text{ min}^{-1}$ (b) $5 \text{ mol L}^{-1} \text{ min}^{-1}$
 (c) $1 \text{ mol L}^{-1} \text{ min}^{-1}$ (d) $0.5 \text{ mol L}^{-1} \text{ min}^{-1}$