

# CHEMISTRY

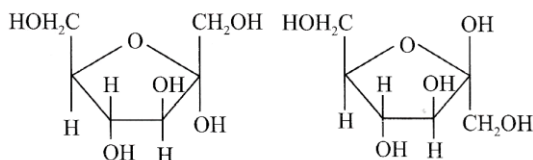
Test Series for NEET Students

Test No. : 02/24

By Khare Sir

## SECTION - A

- The most suitable method for removing water traces from ethanol is  
(a) distillation (b) passing dry HCl  
(c) reacting it with Mg (d) heat with sodium metal.
- The nucleic acid base having three possible binding sites is  
(a) thymine (b) uracil  
(c) guanine (d) adenine.
- Among the following, the one which reacts most readily with ethanol is  
(a) *p*-nitrobenzyl bromide  
(b) *p*-chlorobenzyl bromide  
(c) *p*-methoxybenzyl bromide  
(d) *p*-methylbenzyl bromide.
- Which of the following statements is true for the electrochemical Daniell cell?  
(a) Electrons flow from Cu electrode to Zn electrode.  
(b) Current flows from Zn electrode to Cu electrode.  
(c) Cations move toward Cu electrode.  
(d) Cations move toward Zn electrode.
- Five-membered ring structures of fructose are given below. Mark the incorrect statement.



- The five-membered ring structures are named as furanose structures.  
(b) The cyclic structures represent two anomers of fructose.  
(c) The five-membered ring structures are named as pyranose structures.  
(d) These are also called Haworth structures.
- In the reaction;  
$$\text{CO} + \frac{1}{2}\text{O}_2 \longrightarrow \text{CO}_2; \quad \text{N}_2 + \text{O}_2 \longrightarrow 2\text{NO}$$
10 mL of mixture containing carbon monoxide and nitrogen required 7 mL of oxygen to form  $\text{CO}_2$  and NO on combustion. The volume of  $\text{N}_2$  in the mixture will be  
(a) 7/2 mL (b) 17/2 mL  
(c) 4 mL (d) 7 mL
- The pair of electrons in the given carbanion,  $\text{CH}_3\text{C} \equiv \text{C}^-$ , is present in which of the following orbitals?  
(a)  $sp^2$  (b)  $sp$  (c)  $2p$  (d)  $sp^3$
- In an experiment 20 g of vanadium(V) oxide (molar mass = 182) was reduced by excess of zinc dust in acidic solution to vanadium(II) ions. The required number of moles of iodine to reoxidise vanadium(II) to  $\text{VO}^{2+}$  is  
(a) 0.22 (b) 0.11  
(c) 0.30 (d) 0.23

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

### Column I

### Column II

- |                                     |       |                             |
|-------------------------------------|-------|-----------------------------|
| (A) Uncertainty of an object        | (i)   | $\frac{5.29 \times n^2}{Z}$ |
| (B) Bohr's radius of an orbit       | (ii)  | $\frac{h}{4\pi m}$          |
| (C) Angular momentum of an electron | (iii) | $\frac{h}{mv}$              |
| (D) de Broglie wavelength           | (iv)  | $n \cdot \frac{h}{2\pi}$    |

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

- Choose the incorrect match.

Catalyst	Function
(a) $\text{PdCl}_2$	Wacker's process
(b) Co/Fe	Fischer-Tropsch process
(c) $\text{CuCl}_2$	Deacon process
(d) Ni	Haber's Process

- The energies of activation for forward and reverse reactions for  $A_2 + B_2 \rightleftharpoons 2AB$  are  $180 \text{ kJ mol}^{-1}$  and  $200 \text{ kJ mol}^{-1}$  respectively. The presence of a catalyst lowers the activation energies of both (forward and reverse) reactions by  $100 \text{ kJ mol}^{-1}$ . The enthalpy change of the reaction ( $A_2 + B_2 \longrightarrow 2AB$ ) in the presence of catalyst will be (in  $\text{kJ mol}^{-1}$ )  
(a) -20 (b) -300 (c) -120 (d) -280
- In solid state, the colour of oxygen has been observed as pale blue. This pale colour of oxygen(s) is due to electronic transitions from  
(a) the triplet ground state to the excited singlet state  
(b) the triplet ground state to antibonding  $\sigma 2p_z$  molecular orbital  
(c) the antibonding *p*-molecular orbitals to the bonding  $\sigma 2p_z$  molecular orbital  
(d) the singlet ground state to the excited triplet state.
- The correct decreasing order of priority for the functional groups of organic compounds in the IUPAC system of nomenclature is  
(a)  $-\text{SO}_3\text{H}$ ,  $-\text{COOH}$ ,  $-\text{CONH}_2$ ,  $-\text{CHO}$   
(b)  $-\text{CHO}$ ,  $-\text{COOH}$ ,  $-\text{SO}_3\text{H}$ ,  $-\text{CONH}_2$   
(c)  $-\text{CONH}_2$ ,  $-\text{CHO}$ ,  $-\text{SO}_3\text{H}$ ,  $-\text{COOH}$   
(d)  $-\text{COOH}$ ,  $-\text{SO}_3\text{H}$ ,  $-\text{CONH}_2$ ,  $-\text{CHO}$

**14 Statement I :** The heat absorbed during isothermal expansion of an ideal gas against vacuum is zero.

**Statement II :** The heat absorbed during adiabatic expansion of an ideal gas against a constant external pressure is zero.

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

**15** Four species are listed below.

- I.  $\text{HCO}_3^-$                       II.  $\text{H}_3\text{O}^+$   
 III.  $\text{HSO}_4^-$                      IV.  $\text{HSO}_3\text{F}$

Which one of the following is the correct sequence of their acidic strength?

- (a)  $\text{II} < \text{III} < \text{I} < \text{IV}$         (b)  $\text{I} < \text{III} < \text{II} < \text{IV}$   
 (c)  $\text{III} < \text{I} < \text{IV} < \text{II}$         (d)  $\text{IV} < \text{II} < \text{III} < \text{I}$

**16** The coordination number and the oxidation state of the element 'M' in the complex  $[\text{M}(\text{en})_2(\text{C}_2\text{O}_4)]\text{NO}_2$  (where (en) is ethylene diamine) are, respectively

- (a) 4 and 2                        (b) 4 and 3  
 (c) 6 and 3                        (d) 6 and 2.

**17** For the following three reactions I, II and III equilibrium constants are given :

- I.  $\text{CO}_{(g)} + \text{H}_2\text{O}_{(g)} \rightleftharpoons \text{CO}_{2(g)} + \text{H}_{2(g)}; K_1$   
 II.  $\text{CH}_{4(g)} + \text{H}_2\text{O}_{(g)} \rightleftharpoons \text{CO}_{(g)} + 3\text{H}_{2(g)}; K_2$   
 III.  $\text{CH}_{4(g)} + 2\text{H}_2\text{O}_{(g)} \rightleftharpoons \text{CO}_{2(g)} + 4\text{H}_{2(g)}; K_3$

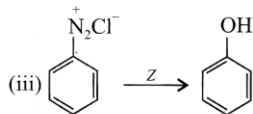
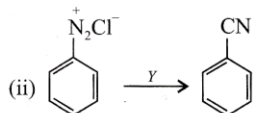
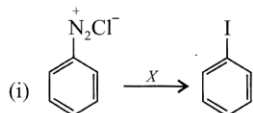
Which of the following relations is correct?

- (a)  $K_2K_3 = K_1$                     (b)  $K_3 = K_1K_2$   
 (c)  $K_3K_2^3 = K_1^2$                 (d)  $K_1\sqrt{K_2} = K_3$

**18** Which one of the following complexes is violet in colour?

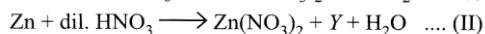
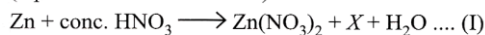
- (a)  $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3 \cdot \text{H}_2\text{O}$  (b)  $[\text{Fe}(\text{CN})_5(\text{NOS})]^{4-}$   
 (c)  $[\text{Fe}(\text{SCN})_6]^{4-}$                 (d)  $[\text{Fe}(\text{CN})_6]^{4-}$

**19** Identify the reagents X, Y and Z for the following products.



- X**                                      **Y**                                      **Z**  
 (a)  $\text{I}_2$ , warm                      KCN, warm                      NaOH, warm  
 (b) CuI                                      NaCN                                      KOH  
 (c) KI, warm                              CuCN                                       $\text{H}_2\text{O}$ , warm  
 (d) AgI, warm                              AgCN, warm                      KOH, boil

**20** The following two reactions of  $\text{HNO}_3$  with Zn are given as (equations are not balanced)



In reactions I and II, the compounds X and Y respectively are

- (a)  $\text{NO}_2$  and NO                    (b)  $\text{NO}_2$  and  $\text{NO}_2$   
 (c) NO and  $\text{NO}_2$                     (d)  $\text{NO}_2$  and  $\text{NH}_4\text{NO}_3$ .

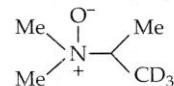
**21** Potassium manganate ( $\text{K}_2\text{MnO}_4$ ) is formed when

- (a) chlorine is passed into aqueous  $\text{KMnO}_4$  solution  
 (b) manganese dioxide is fused with potassium hydroxide in air  
 (c) formaldehyde reacts with potassium permanganate in presence of a strong alkali.  
 (d) potassium permanganate reacts with concentrated sulphuric acid.

**22** The hybridization, oxidation number of central metal ion and shape of Wilkinson's catalyst are

- (a)  $dsp^2$ , +1, square planar  
 (b)  $sp^3$ , +4, tetrahedral  
 (c)  $sp^3d$ , +2, trigonal bipyramidal  
 (d)  $d^2sp^3$ , +6, octahedral.

**23** Pyrolysis of



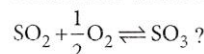
would give

- (a) mixture of  $\text{CH}_2 = \text{CH}-\text{CD}_3$  and  $\text{CH}_3-\text{CH} = \text{CD}_2$   
 (b)  $\text{CH}_3-\text{CH} = \text{CD}_2$   
 (c)  $\text{Me}_2\text{N}^+ = \text{C}(\text{CD}_3)(\text{CH}_3)$   
 (d)  $\text{CH}_2 = \text{CH}-\text{CD}_3$

**24** For an endothermic reaction, where  $\Delta H$  represents the enthalpy of the reaction in kJ/ mol, the minimum value for the energy of activation will be

- (a) less than  $\Delta H$                     (b) zero  
 (c) more than  $\Delta H$                     (d) equal to  $\Delta H$ .

**25** What are the units of  $K_c$  for the equilibrium



- (a)  $\text{Mol}^{1/2} \text{L}^{1/2}$                       (b)  $\text{Mol}^{-1} \text{L}^{-1/2}$   
 (c)  $\text{Mol}^{-1/2} \text{L}$                         (d)  $\text{Mol}^{-1/2} \text{L}^{1/2}$

**26** Which of the following statements is true?

- (a) Absolutely pure water does not contain any ions.  
 (b) Some covalent compounds may also give ions in aqueous solution.  
 (c) In aqueous solution only electrovalent compounds give ions.  
 (d) Very sparingly soluble substances do not dissociate in aqueous solution.

**27** The alicyclic compound that will react most readily with gaseous bromine, has the formula

- (a)  $\text{C}_3\text{H}_6$  (b)  $\text{C}_2\text{H}_2$  (c)  $\text{C}_4\text{H}_{10}$  (d)  $\text{C}_2\text{H}_4$

**28** Which of the following statement is not correct?

- (a) Chlorobenzene has a lower dipole moment than methyl chloride.  
 (b) Vinyl chloride undergoes substitution reaction.  
 (c) Alkyl halides, though polar, are insoluble in water.  
 (d)  $\text{CH}_3\text{CH}_2\text{I}$  is more reactive than  $\text{CH}_3\text{CH}_2\text{Cl}$  towards KCN.

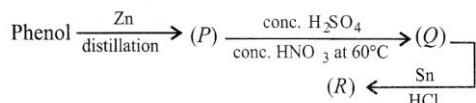
**29** Match the Column I with Column II and mark the appropriate choice.

	Column I		Column II
(A)		(i)	Yellow
(B)		(ii)	Orange
(C)	$(\text{CH}_3)_2\text{CHNO}_2 + \text{HNO}_2$	(iii)	Violet
(D)		(iv)	Blue

## Section-B

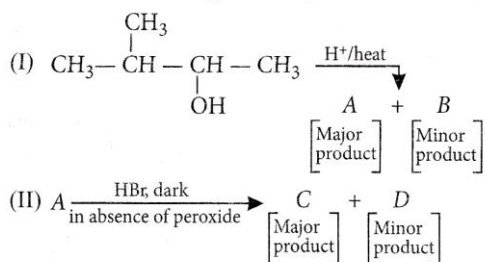
- (a) (A) → (iii), (B) → (iv), (C) → (ii), (D) → (i)  
 (b) (A) → (ii), (B) → (i), (C) → (iv), (D) → (iii)  
 (c) (A) → (i), (B) → (ii), (C) → (iii), (D) → (iv)  
 (d) (A) → (iv), (B) → (iii), (C) → (ii), (D) → (i)

30 In the reaction,



The compounds (P), (Q) and (R) are the following

- (a) benzene, nitrobenzene and aniline  
 (b) benzene, dinitrobenzene and *m*-nitroaniline  
 (c) toluene, *m*-nitrobenzene and *m*-toluidine  
 (d) benzene, nitrobenzene and hydrazobenzene.
- 31 The reaction described below is
- $$\text{CH}_3(\text{CH}_2)_5\text{C}(\text{H})(\text{CH}_3)\text{Br} \xrightarrow{\text{OH}^-} \text{HO}-\text{C}(\text{H})(\text{CH}_3)(\text{CH}_2)_5\text{CH}_3$$
- (a) S<sub>E</sub>1 (b) S<sub>N</sub>2 (c) S<sub>N</sub>1 (d) S<sub>E</sub>2
- 32 RCH<sub>2</sub>CH<sub>2</sub>OH can be converted to RCH<sub>2</sub>CH<sub>2</sub>COOH by the following sequence of reagents.  
 (a) PBr<sub>3</sub>, KCN, H<sub>3</sub>O<sup>+</sup> (b) PBr<sub>3</sub>, KCN, H<sub>2</sub>/Pt  
 (c) KCN, H<sub>3</sub>O<sup>+</sup> (d) HCN, PBr<sub>3</sub>, H<sub>3</sub>O<sup>+</sup>.
- 33 Which of the following reagent has the same role as that of the periodic acid?  
 (a) Lead tetraacetate (b) ZnCl<sub>2</sub>  
 (c) H<sub>3</sub>PO<sub>4</sub> (d) Fuming H<sub>2</sub>SO<sub>4</sub>.
- 34 Consider the following reactions,



What are the major products (A) and (C) are respectively?

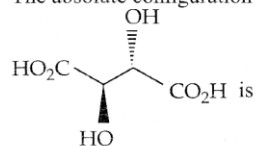
- (a)  $\text{CH}_2=\text{C}(\text{CH}_3)-\text{CH}_2-\text{CH}_3$  and  $\text{CH}_2(\text{Br})-\text{CH}(\text{CH}_3)-\text{CH}_2-\text{CH}_3$   
 (b)  $\text{CH}_3-\text{C}(\text{CH}_3)=\text{CH}-\text{CH}_3$  and  $\text{CH}_3-\text{C}(\text{CH}_3)(\text{Br})-\text{CH}_2-\text{CH}_3$   
 (c)  $\text{CH}_2=\text{C}(\text{CH}_3)-\text{CH}_2-\text{CH}_3$  and  $\text{CH}_3-\text{CH}(\text{CH}_3)-\text{CH}(\text{Br})-\text{CH}_3$   
 (d)  $\text{CH}_3-\text{C}(\text{CH}_3)=\text{CH}-\text{CH}_3$  and  $\text{CH}_3-\text{C}(\text{CH}_3)(\text{Br})-\text{CH}_2-\text{CH}_3$

35 Match the list-I with list-II and select the correct option.

	List-I		List-II
P.	Aldol condensation	(i)	Hydride ion transfer
Q.	Cannizzaro reaction	(ii)	Organozinc compound
R.	Reformatsky reaction	(iii)	CN <sup>-</sup> as catalyst
S.	Benzoin condensation	(iv)	Enolate ion

- | P        | Q     | R    | S     |
|----------|-------|------|-------|
| (a) (iv) | (i)   | (ii) | (iii) |
| (b) (ii) | (iii) | (iv) | (i)   |
| (c) (iv) | (iii) | (ii) | (i)   |
| (d) (ii) | (i)   | (iv) | (iii) |

36 The absolute configuration of



- (a) R, R (b) R, S (c) S, R (d) S, S
- 37 Which ring is cleaved on hydrogenation of the following compound?
- $$\text{A} + \text{H}_2 \xrightarrow{\text{Pd/C}} \text{B}$$
- (a) A (b) B  
 (c) Both A and B (d) None of these.

38 The use of methyl orange as an indicator in the volumetric determination of the equivalent weight of a weak acid would lead to  
 (a) a low value of the equivalent weight  
 (b) a high value of the equivalent weight  
 (c) no error in the value  
 (d) improved accuracy.

39 The oxidation number of S in tetrathionate (S<sub>4</sub>O<sub>6</sub><sup>2-</sup>) is  
 (a) +5 (b) 0  
 (c) 2.5 (d) all of these.

40 Asthma patients use a mixture of ..... for respiration.  
 (a) O<sub>2</sub> and H<sub>2</sub> (b) O<sub>2</sub> and He  
 (c) O<sub>2</sub> and Ar (d) O<sub>2</sub> and Ne

41 The rapid change of pH near the stoichiometric point of an acid-base titration is the basis of indicator detection. pH of the solution is related to the ratio of the concentration of conjugate acid (HIn) and base (In<sup>-</sup>) forms of the indicator by the expression.

- (a)  $\log \frac{[\text{In}^-]}{[\text{HIn}]} = \text{p}K_a + \text{pH}$   
 (b)  $\log \frac{[\text{HIn}]}{[\text{In}^-]} = K_a + \text{pH}$   
 (c)  $\log \frac{[\text{HIn}]}{[\text{In}]} = \text{pH} - \text{p}K_a$   
 (d)  $\log \frac{[\text{In}^-]}{[\text{HIn}]} = \text{pH} - \text{p}K_a$ .

42 Equivalent weight of an oxidant is molecular weight divided by  
 (a) number of electrons lost by one molecule of oxidant  
 (b) number of electrons gained by one molecule of oxidant  
 (c) number of H<sup>+</sup> furnished by one molecule  
 (d) number of OH<sup>-</sup> furnished by one molecule.

43 What will be the normality of a solution obtained by mixing 0.45 N and 0.60 N NaOH in the ratio 2 : 1 by volume?  
 (a) 0.4 N (b) 0.5 N (c) 1.05 N (d) 0.15 N

44 An aqueous solution of a substance gives a white precipitate on treatment with dilute hydrochloric acid, which dissolves on heating. When hydrogen sulphide is passed through the hot acidic solution, a black precipitate is obtained. The substance is a  
 (a) Hg<sub>2</sub><sup>2+</sup> salt (b) Cu<sup>2+</sup> salt  
 (c) Ag<sup>+</sup> salt (d) Pb<sup>2+</sup> salt.

45 A gas 'X' is passed through water to form a saturated solution. The aqueous solution on treatment with silver nitrate gives a white precipitate. The saturated aqueous solution also dissolves magnesium ribbon with evolution of a colourless gas 'Y'. Identify 'X' and 'Y'.  
 (a) X = CO<sub>2</sub>, Y = Cl<sub>2</sub> (b) X = Cl<sub>2</sub>, Y = CO<sub>2</sub>  
 (c) X = Cl<sub>2</sub>, Y = H<sub>2</sub> (d) X = H<sub>2</sub>, Y = Cl<sub>2</sub>.

- 46 If  $\text{CH}_3\text{COOH} + \text{OH}^- \rightarrow \text{CH}_3\text{COO}^- + \text{H}_2\text{O} + q_1$  and  $\text{H}^+ + \text{OH}^- \rightarrow \text{H}_2\text{O} + q_2$ , then the enthalpy change for the reaction,  $\text{CH}_3\text{COOH} \rightarrow \text{CH}_3\text{COO}^- + \text{H}^+$ , is equal to
- (a)  $q_1 + q_2$  (b)  $q_1 - q_2$   
 (c)  $q_2 - q_1$  (d)  $-q_1 - q_2$
- 47 What is the effect of shaking dilute  $\text{H}_2\text{SO}_4$  with a small quantity of anhydrous  $\text{CuSO}_4$ ?
- (a) The white solid dissolves to form a colourless solution.  
 (b) The white solid dissolves to form a green solution.  
 (c) The white solid dissolves to form a blue solution.  
 (d) The white solid turns blue but does not dissolve.
- 48 Skin turns yellow in contact with conc.  $\text{HNO}_3$ , because
- (a) proteins are converted into xanthoproteins  
 (b) water is removed by the acid  
 (c) skin gets burnt  
 (d) nitrocellulose is formed.
- 49 **Statement I** :  $\text{CH}_2\text{Cl}_2$  is polar and  $\text{CCl}_4$  is non-polar molecule.  
**Statement II** : Molecule with zero dipole moment is non-polar in nature.
- (a) Both statement I and statement II are correct.  
 (b) Both statement I and statement II are incorrect.  
 (c) Statement I is correct but statement II is incorrect.  
 (d) Statement II is correct, but statement I is incorrect.

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

Column I		Column II	
(A)	$\text{CH}_3\text{COONa}$	(i)	Almost neutral, $\text{pH} > 7$ or $< 7$
(B)	$\text{NH}_4\text{Cl}$	(ii)	Acidic, $\text{pH} < 7$
(C)	$\text{NaNO}_3$	(iii)	Alkaline, $\text{pH} > 7$
(D)	$\text{CH}_3\text{COONH}_4$	(iv)	Neutral, $\text{pH} = 7$

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