

# CUET (UG) 2024

## Questions, Answer Key & Solutions

**Subject: Chemistry | Code: 306 E | Medium: English | Test Date: 15-MAY-2024**

(Do not open this Test Booklet until you are asked to do so)

<b>Time Allowed: 60 minutes</b>	<b>Maximum Marks: 200</b>	<b>Total Questions : 50</b>	<b>Number of Questions to be answered : 40</b>
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Kindly read the Instructions given on this Page and Back Page carefully before attempting this Question Paper

### Important Instructions for the Candidates:

1. This Test Booklet contains **50** questions printed in English. Out of these, the candidate is required to answer any **40** questions. If a candidate answers more than 40 questions, the first 40 answered questions will be considered for evaluation.
2. When you are given the OMR Answer Sheet, fill in your particulars on it carefully with blue/black ball point pen only.
3. Use only Blue/Black Ball Point Pen for marking responses.
4. The CODE for this Test Booklet is **D**. Make sure that the CODE printed on the OMR Answer Sheet is the same as that on this Test Booklet. Also ensure that your Test Booklet No. and OMR Answer Sheet No. are exactly the same. In case of discrepancy, the candidate should immediately report the matter to the Invigilator for replacement of both the Test Booklet and the OMR Answer Sheet. No claim in this regard will be entertained after five minutes from the start of the examination.
5. Before attempting the question paper kindly check that this Test Booklet has total **14** pages and OMR Answer Sheet consists of one sheet. At the start of the examination within first five minutes, candidates are advised to ensure that all pages of Test Booklet and OMR Answer Sheet are properly printed and they are not damaged in any manner.]
6. Each question has four answer options. Out of these four options choose the **MOST APPROPRIATE OPTION** and darken/blacken the corresponding circle on the OMR Answer Sheet with a Blue/Black Ball Point Pen.
7. Five (5) marks will be given for each correct answer. One (1) mark will be deducted for each incorrect answer. If more than one circle is found darkened/blacked for a question, then it will be considered as an incorrect answer. Unanswered questions will be given no mark.

Name of the Candidate (in Capital Letters): \_\_\_\_\_

Application Number (in figures): \_\_\_\_\_

Roll Number (in figures): \_\_\_\_\_

Centre of Examination (in Capital Letters): \_\_\_\_\_

Invigilator's Signature: \_\_\_\_\_

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**Read carefully the following instructions:**

8. No candidate will be allowed to leave the **OMR Answer Sheet** blank. If any OMR Answer Sheet is found blank, it shall be crossed by the Invigilator with his/her signature, mentioning "Cancelled" on it.
9. Do not tear or fold any page of the Test Booklet and OMR Sheet.
10. Candidates are advised to ensure that they fill the correct particulars on the OMR Answer Sheet, i.e., Application No., Roll No., Test Booklet No., Name, Mother's Name, Father's Name and Signature.
11. Rough work is to be done in the space provided for this purpose in the Test Booklet only.
12. The answers will 'be evaluated through electronic scanning process. Incomplete or incorrect entries may render the OMR Answer Sheet invalid.
13. Candidates are advised not to fold or make any stray marks on the OMR Answer Sheet. Use of Eraser, Nail, Blade, White Fluid/Whitener, etc., to smudge, scratch or damage in any manner the OMR Answer Sheet during examination is strictly prohibited. Candidature and OMR Answer Sheet of candidates using Eraser, Nail, Blade or White Fluid/Whitener to smudge, scratch or damage in any manner shall be cancelled.
14. There will be one copy of OMR Answer Sheet i.e., the Original Copy. After the examination is over, the candidate shall hand over the OMR Answer Sheet to the Invigilator. The candidate can take away the Test Booklet after the examination is over. If the candidate does not hand over the OMR Answer Sheet to the Invigilator and goes away with the OMR Answer Sheet, his/her candidature shall be cancelled and criminal proceedings shall also be initiated against him/her.
15. Candidates are advised strictly not to carry handkerchief, any mobile phone, any type of watch, belt or wear ornaments like ring, chain, ear-ring, etc., electronic or communication device, pen, pencil, eraser, sharpener and correction fluid to the Examination Centre. If candidate is found possessing any such item, he/she will not be allowed to enter the examination centre. Possession of a mobile phone or any other aiding material as mentioned above by the candidate in the examination room will be treated as a serious violation and it may lead to cancellation of the candidature and debarring him/her from future examinations.
16. If a candidate violates any instructions or shows any indiscipline or misbehaviour, appropriate action will be taken including cancellation of candidature and debarring from future examinations.
17. Use of electronic/manual calculator is **not** allowed.






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## CHEMISTRY

1. The increasing order of acidity of the following compounds based on  $pK_a$  values is  
(A)  $\text{BrCH}_2\text{COOH}$       (B)  $\text{ClCH}_2\text{COOH}$       (C)  $\text{FCH}_2\text{COOH}$       (D)  $\text{HCOOH}$

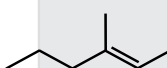
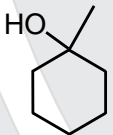
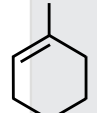
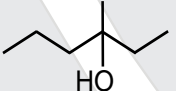

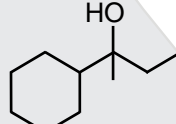
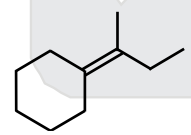
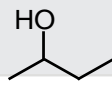
Choose the correct answer from the options given below:

- (1)  $(\text{D}) < (\text{A}) < (\text{B}) < (\text{C})$       (2)  $(\text{A}) < (\text{D}) < (\text{C}) < (\text{B})$   
(3)  $(\text{B}) < (\text{A}) < (\text{D}) < (\text{C})$       (4)  $(\text{C}) < (\text{B}) < (\text{D}) < (\text{A})$

Ans. (1)

Sol. Acidic strength  $\alpha - \text{I}$  effect. Order of  $-\text{I}$  effect ( $\text{F} > \text{Cl} > \text{Br}$ ).

2. In the following table, match the reactants given in List-I with the correct product in List-II as per the reaction of hydration of alkene under acidic condition.

List-I (Reactants)	List-II (Product)
(A) 	(I) 
(B) 	(II) 
(C) 	(III) 
(D) 	(IV) 

Choose the correct answer from the options given below:

- (1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)      (2) (A) - (I), (B) - (III), (C) - (II), (D) - (IV)  
(3) (A) - (II), (B) - (I), (C) - (IV), (D) - (III)      (4) (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Ans. (3)

Sol. Addition according to Markovnikov's Rule.

3. Which among the following is not an Analgesic ?  
(1) Morphine      (2) Heroin      (3) Codeine      (4) Ranitidine

Ans. (4)

Sol. It is an antacid.

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4. For  $S_N2$  reaction, the increasing order of the reactivity of the following alkyl halides is:

- (A)  $CH_3CH_2CH_2CH_2Br$  (B)  $CH_3CH_2CH(Br)CH_3$   
(C)  $(CH_3)_3CBr$  (D)  $(CH_3)_2CHCH_2Br$

Choose the correct answer from the options given below:

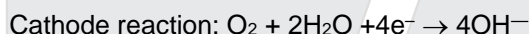
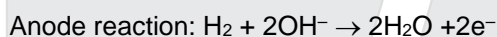
- (1) (A) < (B) < (C) < (D) (2) (A) < (C) < (B) < (D)  
(3) (B) < (A) < (D) < (C) (4) (C) < (B) < (D) < (A)

Ans. (4)

Sol.  $\therefore$  steric hindrance

Read the following passage and answer the next five questions based on it.

Battery or cell converts chemical energy of the redox reaction to electrical energy. In fuel cell (a galvanic cell), the chemical energy of combustion of fuels like  $H_2$ , ethanol, etc. are directly converted to electrical energy. In a fuel cell,  $H_2$  and  $O_2$  react to produce electricity, where  $H_2$  gas is oxidised at anode and oxygen is reduced at cathode and the reactions involved are



67.2 L of  $H_2$  at STP reacts in 15 minutes.

5. The number of moles of hydrogen oxidised is:

- (1) 0.33 moles (2) 33.3 moles (3) 3.0 moles (4) 1.33 moles

Ans. (3)

Sol.  $\frac{67.2}{22.4} = 3$  moles of  $H_2$ .

6. The number of moles of electrons produced in the oxidation of 67.2 L of  $H_2$  at STP is:

- (1) 2 moles (2) 4 moles (3) 1 mole (4) 6 moles

Ans. (4)

Sol. 1 mole gives  $2e^-$ , 3 mole  $H_2$  will give  $-6e^-$

7. The quantity of electricity produced in the oxidation of 67.2 L of  $H_2$  at STP is:

- (1) 96500 C (2) 579000 C (3) 193000 C (4) 48250 C

Ans. (2)

Sol.  $96500 \times 6F = 579000C$

8. If the entire current produced is used for the electrodeposition of Silver (at.wt.  $108 \text{ g mol}^{-1}$ ) from Silver (I) solution, the amount of silver deposited will be :

- (1) 324 g (2) 648 g (3) 108 g (4) 216 g

Ans. (2)

Sol.  $\therefore Ag^+ + e^- \rightarrow Ag$

(1F)

$\therefore 1F \rightarrow 108 \text{ g}$

$\therefore 6F \rightarrow 108 \times 6 = 648 \text{ g}$

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9. The source of electrical energy on the Apollo moon flight was:
- (1) Lead storage battery (2) A generator set  
(3) Ni-Cd cells (4) H<sub>2</sub>-O<sub>2</sub> Fuel cell

Ans. (4)

Sol. H<sub>2</sub>-O<sub>2</sub> fuel cell was used in apollo space programme.

Read the following passage and answer the next five questions based on it.

Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn
Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd
La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg

In any transition series, as we move from left to right the d-orbitals are progressively filled and their properties vary accordingly.

Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

The above are the two series of f-block elements in which the chemical properties won't change much. The 5f-series elements are radioactive in nature and mostly are artificially synthesized in laboratories and thus much is not known about their chemical properties

10. Identify the **incorrect** statement.
- (1) Second ionisation enthalpy of Ag is greater than second ionisation enthalpy of Pd.  
(2) Zr and Hf shares almost identical nuclear properties.  
(3) Melting point of Mn is lower than that of Cr.  
(4) Interstitial compounds are non-stoichiometric and neither ionic nor covalent in nature.

Ans. (2)

Sol. Zr & Hf have similar atomic radius.

11. Which of the following is the correct order of second ionisation enthalpy ?
- (1) V > Cr > Mn (2) V < Cr < Mn (3) V < Cr > Mn (4) V > Cr < Mn

Ans. (3)

Sol. V<sup>+</sup>(d<sup>3</sup>s<sup>1</sup>) ; Cr<sup>+</sup>(d<sup>5</sup>) ; Mn<sup>+</sup>(d<sup>5</sup>s<sup>1</sup>)

12. Which of the following pair of compounds exhibits same colour in aqueous solution ?
- (1) FeCl<sub>2</sub>, CuCl<sub>2</sub> (2) VOCl<sub>2</sub>, CuCl<sub>2</sub> (3) VOCl<sub>2</sub>, FeCl<sub>2</sub> (4) VOCl<sub>2</sub>, MnCl<sub>2</sub>

Ans. (2)

Sol. V<sup>4+</sup>, Cu<sup>2+</sup> → Blue, Fe<sup>2+</sup> → Light green; Mn<sup>2+</sup> → pink

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13. Which metal has the highest oxidation state in the first row transition series?

- (1) Cr (2) Fe (3) Mn (4) V

Ans. (3)

Sol. Mn shows maximum oxidation state upto  $Mn^{7+}$ .

14. Why do the actinoids exhibit higher number of oxidation states than lanthanoids ?

- (1) 4f orbitals are more diffused than the 5f orbitals.  
 (2) Energy difference between 5f and 6d is less with respect to the energy difference between 4f and 5d.  
 (3) Energy difference between 5f and 6d is more with respect to the energy difference between 4f and 5d.  
 (4) Actinoids are more reactive in nature than the lanthanoids.

Ans. (2)

Sol. Energy difference between 5f and 6d is less with respect to the energy difference between 4f and 5d.

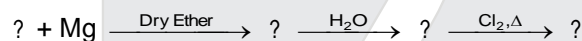
15. Camphor in nitrogen gas is a type of solution

- (1) Gas-Gas (2) Solid – Gas (3) Liquid-Gas (4) Solid-Liquid

Ans. (2)

Sol. Solid – Gas

16. Identify the correct order of organic compounds in the following chemical reaction:



- (A)  $CH_3MgBr$  (B)  $CH_3Br$  (C)  $CH_3Cl$  (D)  $CH_4$

Choose the correct answer from the options given below :

- (1) (B), (A), (D), (C) (2) (A), (C), (B), (D) (3) (B), (A), (C), (D) (4) (C), (B), (D), (A)

Ans. (2)



- (B) (A) (D) (C)

17. Consider the following statements regarding osmotic pressure :

- (A) Molar mass of a protein can be determined using osmotic pressure method.  
 (B) The osmotic pressure is proportional to the molarity.  
 (C) Reverse osmosis occurs when a pressure larger than osmotic pressure is applied to the concentrated solution side.  
 (D) Edema occurs due to retention of water in tissue cells as a result of osmosis.

Choose the correct statements with reference to osmotic pressure:

- (1) (A), (B) and (D) only (2) (A), (B) and (C) only  
 (3) (A), (B), (C) and (D) (4) (B), (C) and (D) only

Ans. (3)

Sol. All are correct.

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18. Vapour pressures of pure liquids 'A' and 'D' at 50°C are 500 mm Hg and 800 mm Hg respectively. The binary solution of 'A' and 'D' boils at 50°C and 700 mm Hg pressure. The mole percentage of 'D' in the solution is :

- (1) 33.33 mole percent (2) 66.67 mole percent  
(3) 25.75 mole percent (4) 75.25 mole percent

Ans. (2)

Sol.  $P_T = P_1^0 + x_2 (P_2^0 - P_1^0)$  Here  $P_1^0 = 500 \text{ mmHg}$

$$700 = 500 + x_2 (800 - 500) \quad P_2^0 = 800 \text{ mmHg}$$

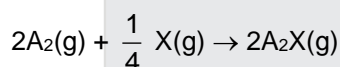
$$700 - 500 = x_2 (300) \quad P_T = 700 \text{ mmHg}$$

$$\frac{200}{300} = x_2$$

$$\Rightarrow x_2 = 0.666$$

$$\% \text{ mole} = 66.6$$

19. For the following reaction:



volume is increased to double its value by decreasing the pressure on it. If the reaction is first order with respect to X and second order with respect to  $A_2$ , the rate of reaction will :

- (1) Decrease by eight times of its initial value  
(2) Increase by eight times of its initial value  
(3) Increase by four times of its initial value  
(4) Remain unchanged

Ans. (1)

Sol.  $\therefore \text{Rate} = k[X][A_2]^2$

$$\text{Rate}_1 = k \left[ \frac{1}{4} X \right] [2A_2]^2 = kA_2^2 X$$

$$\text{Rate}_2 = k \left[ \frac{1}{8} X \right] [A_2]^2 = \frac{kA_2^2 X}{8}$$

20. The total number of sigma bonds present in  $P_4O_{10}$  are:

- (1) 6 (2) 7 (3) 16 (4) 17

Ans. (3)

Sol.  $\therefore$  4P atoms are involved, so the total no. of sigma bonds present are 4 times  $\therefore$  e. 16  $\sigma$  bonds.

21. In the electrolysis of alumina to obtain Aluminium metal, the cryolite is added mainly to

- (1) lower the melting point of alumina. (2) dissolve the alumina in the molten cryolite.  
(3) remove the impurities of alumina. (4) increase the electrical conductivity.

Ans. (1)

Sol. Cryolite is added to alumina to reduce its M.P.

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27. The total number of ions produced from the complex  $[\text{Cr}(\text{NH}_3)_6]\text{Cl}_3$  in aqueous solution will be \_\_\_\_\_  
 (1) 2 (2) 3 (3) 4 (4) 5

Ans. (3)

Sol.  $[\text{Cr}(\text{NH}_3)_6]\text{Cl}_3 \rightarrow [\text{Cr}(\text{NH}_3)_6]^{3+} + 3\text{Cl}^-$

28. Arrange the following in decreasing order of number of molecules contained in:

(A) 16 g of  $\text{O}_2$  (B) 16 g of  $\text{CO}_2$   
 (C) 16 g of  $\text{CO}$  (D) 16 g of  $\text{H}_2$

Choose the correct order from the options given below :

(1) (A), (B), (C), (D) (2) (D), (C), (A), (B)  
 (3) (B), (A), (D), (C) (4) (C), (B), (D), (A)

Ans. (2)

Sol. Molecular mass of  $\text{O}_2 = 32$ .

Molecular mass of  $\text{CO}_2 = 44$ .

Molecular mass of  $\text{CO} = 28$ .

Molecular mass of  $\text{H}_2 = 2$ .

$\therefore$  no of molecule  $\propto$  no. of mole  $\propto \frac{1}{\text{M.M}}$

More the molceules mass, less will be no. of moles.

Hence, order is : (D), (C), (A), (B).

29. The Cu metal crystallises into fcc lattice with a unit cell edge length of 361 pm. The radius of Cu atom is:

(1) 127 pm (2) 181 pm (3) 157 pm (4) 108 pm

Ans. (1)

Sol. in fcc  $r = \frac{a}{2\sqrt{2}}$   $\therefore a = 361$   $\therefore r = \frac{361}{2\sqrt{2}} = 127.6 \text{ pm}$

30. If 75% of a first order reaction gets completed in 32 minutes, time taken for 50% completion of this reaction is

(1) 16 minutes (2) 78 minutes (3) 8 minutes (4) 4 minutes

Ans. (1)

Sol. 75% compeletion i.e., 2 half lives = 32 minutes.

50% compeletion i.e., 1 half life = 16 minutes.

31. Which of the following compounds will be repelled when placed in an external magnetic field ?

(1)  $\text{Na}_2[\text{CuCl}_4]$  (2)  $\text{Na}_2[\text{CdCl}_4]$  (3)  $\text{K}_4[\text{FeCN}_6]$  (4)  $\text{K}_3[\text{Fe}(\text{CN})_6]$

Ans. (2)

Sol. Repelled by magnetic filed = diamgnetic ( $d^0$  or  $d^{10}$ )






$\therefore \text{Cd}^{2+} \Rightarrow d^{10}$

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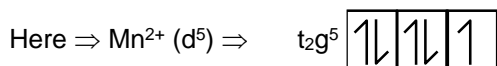
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32. The spin only magnetic moment of Hexacyanomanganate(II) ion is \_\_\_\_\_ B.M.  
(1) 5.90 (2) 1.73 (3) 4.90 (4) 3.87

Ans. (2)

Sol. Hexacyanomanganate (II)  $[\text{Mn}(\text{CN})_6]^{4+}$



due to pairing only one  $e^-$  is unpaired  $\therefore \mu = 1.73 \text{ BM}$

33. The correct order of increasing boiling points of the following compounds is :

Pental-1-ol, n-Butane, Pentanal, Ethoxyethane

- (1) Ethoxyethane, Pentanal, n-Butane, Pental-1-ol  
(2) Pentanal, n-Butane, Ethoxyethane, Pental-1-ol  
(3) n-Butane, Pentanal, Ethoxyethane, Pental-1-ol  
(4) n-Butane, Ethoxyethane, Pentanal, Pental-1-ol

Ans. (4)

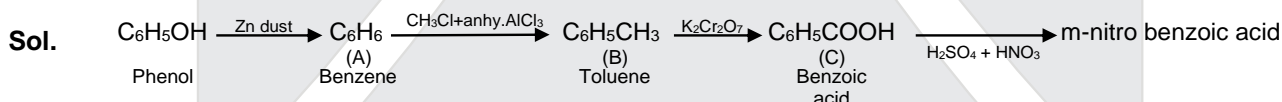
Sol. Since only pental-1-ol molecules are associated due to extensive intermolecular hydrogen bonding, therefore, the boiling point of pental-1-ol would be the highest. Pentane is more polar than ethoxyethane. Therefore, the intermolecular dipole-dipole attraction is stronger the former. n-Butane molecules have only weak van der Waas forces. Hence increasing order of boiling points of the given compounds is as follows: n-Butane, Ethoxyethane, Pentanal, Pental-1-ol.

34. In the following reaction, identify the product D.



- (1) o-Nitrobenzoic acid (2) p-Nitrobenzoic acid  
(3) o, p-Dinitrobenzoic acid (4) m-Nitrobenzoic acid

Ans. (4)



35. The gold number range of some of the lyophilic colloids is given below :

A : 0.005 – 0.01, B : 0.15 – 0.25, C : 0.04 – 1.0 and D : 15 – 25.

Which among these can be used as a better protective colloid ?

- (1) A (2) B (3) C (4) D

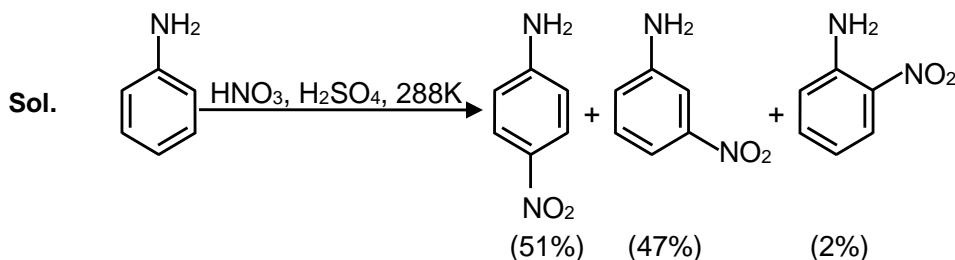
Ans. (1)

Sol. Smaller the gold no, protection power is greater.

36. Reaction of aniline with conc.  $\text{HNO}_3$  and conc.  $\text{H}_2\text{SO}_4$  at 298 K will produce 47% of

- (1) p-Nitroaniline (2) o- Nitroaniline (3) m-Nitroaniline (4) 2,4-Dinitroaniline

Ans. (3)








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37. What will be increasing order of basic strength of the following compounds ?

$C_2H_5NH_2$ ,  $(C_2H_5)_2NH$ ,  $(C_2H_5)_3N$ ,  $C_6H_5NH_2$

(1)  $C_2H_5NH_2 < (C_2H_5)_2NH < (C_2H_5)_3N < C_6H_5NH_2$

(2)  $C_6H_5NH_2 < C_2H_5NH_2 < (C_2H_5)_3N < (C_2H_5)_2NH$

(3)  $(C_2H_5)_3N < (C_2H_5)_2NH < C_2H_5NH_2 < C_6H_5NH_2$

(4)  $(C_2H_5)_2NH < (C_2H_5)_3N < C_2H_5NH_2 < C_6H_5NH_2$

Ans. (2)

Sol.  $C_6H_5NH_2 < C_2H_5NH_2 < (C_2H_5)_3N < (C_2H_5)_2NH$

38. Which of the following compounds will give Hell-Volhard-Zelinsky reaction ?

(1)  $R-CH_2-COOH$

(2)  $R_3C-CHO$

(3)  $R_2CO$

(4)  $H-COOH$

Ans. (1)

Sol. Carboxylic acid with  $\alpha$ -hydrogen will give HVZ reaction.

39. Arrange the following acids in increasing order of their acidic strengths :

$HCOOH$ ,  $FCH_2COOH$ ,  $NO_2CH_2COOH$ ,  $ClCH_2COOH$

(1)  $HCOOH < FCH_2COOH < NO_2CH_2COOH < ClCH_2COOH$

(2)  $HCOOH < NO_2CH_2COOH < ClCH_2COOH < FCH_2COOH$

(3)  $NO_2CH_2COOH < HCOOH < ClCH_2COOH < FCH_2COOH$

(4)  $HCOOH < ClCH_2COOH < FCH_2COOH < NO_2CH_2COOH$

Ans. (4)

Sol. Acidic strength  $\alpha$  - I effect.

Order of - I effect -  $NO_2 > -F > -Cl$ .

40. Is the following compounds, what is the increasing order of their reactivity towards nucleophilic addition reactions ?

Benzaldehyde, p-Tolualdehyde, p-Nitrobenzaldehyde, Acetophenone

(1) Benzaldehyde < p-Tolualdehyde < p-Nitrobenzaldehyde < Acetophenone

(2) Acetophenone < Benzaldehyde < p-Tolualdehyde < p-Nitrobenzaldehyde

(3) Acetophenone < p-Tolualdehyde < Benzaldehyde < p-Nitrobenzaldehyde

(4) Benzaldehyde < Acetophenone < p-Tolualdehyde < p-Nitrobenzaldehyde

Ans. (3)

Sol. Acetophenone is a ketone. All the other three compounds are aldehydes. Hence, acetophenone is least reactive.

p-Tolualdehyde has an electron-donating methyl group at the para position of the benzene ring whereas p-nitrobenzaldehyde has an electron-withdrawing nitro group at the para position. Thus, p-tolualdehyde is less reactive and p-nitrobenzaldehyde is more reactive than benzaldehyde. Therefore, the required order is as follows:

Acetophenone < p-Tolualdehyde < Benzaldehyde < p-Nitrobenzaldehyde

41. The Gatterman-Koch reaction is used in the industrial preparation of benzaldehyde. The electrophile involved in this reaction is

(1)  $CO^+$

(2)  $HCl + CO_2 + \text{anhydrous } AlCl_3$

(3)  $HCO^+$

(4)  $CO + \text{anhydrous } AlCl_3$

Ans. (3)

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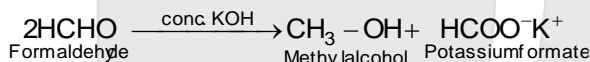
42. Formaldehyde undergoes Cannizzaro reaction because  
 (A) It has alpha-hydrogen atom.  
 (B) It does not have alpha-hydrogen atom.  
 (C) It does not undergo self-oxidation and reduction on heating with concentrated alkali.  
 (D) It undergo self-oxidation and reduction on heating with concentrated alkali.

Choose the correct answer from the options given below :

- (1) (B) and (D) only      (2) (A) and (C) only      (3) (B) and (C) only      (4) (A) and (D) only

Ans. (1)

**Sol.** **Cannizzaro reaction:** Aldehydes which do not have an  $\alpha$ -hydrogen, undergo self oxidation and reduction (disproportionation) reaction on treatment with concentrated alkali. In this reaction, one molecule of the aldehyde is reduced to alcohol while another is oxidised to carboxylic acid salt.

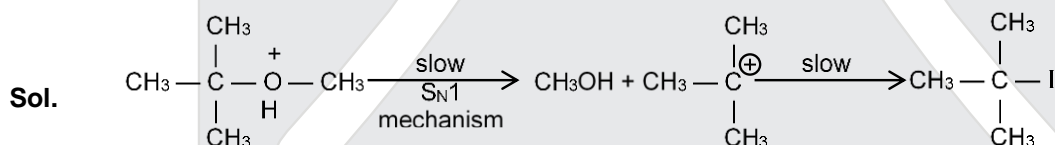


43. In the reaction  $(\text{CH}_3)_3\text{C-O-CH}_3 + \text{HI} \rightarrow \text{Products}$   
 $\text{CH}_3\text{OH}$  and  $(\text{CH}_3)_3\text{C-I}$  are the products and not  $\text{CH}_3\text{I}$  and  $(\text{CH}_3)_3\text{C-OH}$ . It is because,  
 (A) in step 2 of the reaction the departure of leaving group ( $\text{HO-CH}_3$ ) creates less stable carbocation.  
 (B) in step 2 of the reaction the departure of leaving group ( $\text{HO-CH}_3$ ) creates more stable carbocation.  
 (C) the reaction follows  $\text{S}_{\text{N}}1$  mechanism.  
 (D) the reaction follows  $\text{S}_{\text{N}}2$  mechanism.

Choose the correct answer from the options given below :

- (1) (B) and (D) only      (2) (B) and (C) only      (3) (A) and (D) only      (4) (A) and (C) only

Ans. (2)



44. Aniline does not undergo Friedal-Crafts reaction because  
 (A) It forms salt with the Lewis acid catalyst,  $\text{AlCl}_3$ .  
 (B) Nitrogen of aniline acquires negative charge.  
 (C) Nitrogen of aniline acquires positive charge.  
 (D) Nitrogen acts as a strong deactivating group in the further reaction.

Choose the correct answer from the options given below :

- (1) (A), (B) and (D) only                      (2) (A), (B) and (C) only  
 (3) (A), (C) and (D) only                      (4) (B), (C) and (D) only

Ans. (3)

**Sol.** (A) It forms salt with the Lewis acid catalyst,  $\text{AlCl}_3$ .  
 (C) Nitrogen of aniline acquires positive charge.  
 (D) Nitrogen acts as a strong deactivating group in the further reaction.

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48. Match List-I with List-II.

List-I	List-II
(A) Tollen's reagent	(I) Rochelle salt
(B) Jones reagent	(II) Conc. HCl and ZnCl <sub>2</sub>
(C) Lucas reagent	(III) Ammoniacal silver nitrate
(D) Fehling solution	(IV) Chromium trioxide-sulphuric acid

Choose the correct answer from the options given below :

- (1) (A) – (III), (B) – (IV), (C) – (II), (D) – (I)      (2) (A) – (IV), (B) – (III), (C) – (I), (D) – (II)  
 (3) (A) – (I), (B) – (IV), (C) – (II), (D) – (III)      (4) (A) – (III), (B) – (I), (C) – (IV), (D) – (II)

Ans. (1)

49. Match List-I with List-II.

List-I	List-II
(A) Swarts Reaction	(I) $C_6H_5NH_2 + NaNO_2 + HX + Cu_2X_2 \rightarrow C_6H_5X + N_2$
(B) Finkelstein reaction	(II) $2RX + 2Na \rightarrow R-R + 2NaX$
(C) Sandmeyer's reaction	(III) $RX + AgF \rightarrow R-F + AgX$
(D) Wurtz reaction	(IV) $RX + NaI \rightarrow R-I + NaX$

Choose the correct answer from the options given below :

- (1) (A) – (I), (B) – (II), (C) – (III), (D) – (IV)      (2) (A) – (I), (B) – (III), (C) – (II), (D) – (IV)  
 (3) (A) – (I), (B) – (II), (C) – (IV), (D) – (III)      (4) (A) – (III), (B) – (IV), (C) – (I), (D) – (II)

Ans. (4)

50. Match List-I with List-II.

List-I (Biomolecule)	List-II (Function / Diseases)
(A) Vitamin A	(I) Menstrual cycle
(B) Thiamine	(II) Xerophthalmia
(C) Glucocorticoids	(III) Beri – Beri
(D) Estradiol	(IV) Addison's disease

Choose the correct answer from the options given below :

- (1) (A) – (III), (B) – (II), (C) – (I), (D) – (IV)      (2) (A) – (II), (B) – (III), (C) – (I), (D) – (IV)  
 (3) (A) – (III), (B) – (II), (C) – (IV), (D) – (I)      (4) (A) – (II), (B) – (III), (C) – (IV), (D) – (I)

Ans. (4)

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