MCQ FOR FUNCTIONAL GROUP III (ALDEHYDE ,KETONE ,ACID & DERIVATIVES)

Q.1 Ketones $\left(R-\overset{O}{\overset{\|}{C}}-R'\right)$ can be obtained in one step by (where R and R' are alkyl groups)

(a) Hydrolysis of esters

(b) Oxidation of primary alcohols

(c) Oxidation of secondary alcohols

(d) Reaction of alkyl halides with alcohols.

Q.2 Ozonolysis of an organic compound gives formaldehyde as one of the products. This confirms the Presence of

(a) Two ethylenic double bonds (b) A vinyl group

(c) An isopropyl group (d) An acetylenic triple bond.

Q.3 The oxidation of toluene to benzaldehyde by chromyl chloride is called

(a) Etard reaction (b) Riemer-Tiemann reaction

(c) Wurtz reaction (d) Cannizzaro reaction

Q.4 Arrange the following compounds in increasing order of their reactivity in nucleophilic addition reactions.

Ethanal, Propanal, Propanone, Butanone

(a) Butanone<Propanone< Propanal < Ethanal

(b) Propanone< Butanone< Ethanal< Propanal

(c) Propanal< Ethanal<Propanone< Butanone

(d) Ethanal< Propanal < Propanone < Butanone

Q.5 Which of the following compounds does not react with $NaHSO_3$

(a) HCHO (b) $C_6H_5COCH_3$ (c) CH_3COCH_3 (d) CH_3CHO

Q.6 An organic compound (X) with molecular formula C_3H_6O in not readily oxidised. On reduction it gives C_3H_8O (Y) which reacts with HBr to give a bromide (Z) which is converted to Grignard reagent. Grignard reagent reacts with (X) to give 2,3- dimethylbutane-2-ol. (X),(Y) and (Z) respectively are

(a) CH_3COCH_3, $CH_3CH_2CH_2OH$,$CH_3CH(Br)CH_3$

(b) CH_3CH_2CHO, $CH_3CH=CH_2$, $CH_3CH(Br)CH_3$

(c) CH_3COCH_3, $CH_3CH(OH)CH_3$, $CH_3CH(Br)CH_3$

(d) CH_3CH_2CHO, $CH_3CH_2CH_2OH$, $CH_3CH_2CH_2$ Br.

Q.7 $R-CH=CH-CHO+NH_2-\overset{O}{\overset{\|}{C}}-NHNH_2 \xrightarrow{H^+} X$

(*X*) in the above reaction is

(a) $R-CH=CH-\overset{OH}{\overset{|}{C}}H-NH_2CONHNH_2$ (b) $R-CH=CH-CH=N-NH-\overset{O}{\overset{\|}{C}}-NH_2$

(c) $R-CH=NH_2CONH_2$ (d) $R-CH=CH-\underset{OH}{\overset{|}{C}}H-NH2COCH=NHNH2$

Q.8 The best oxidising agent for oxidation of

$CH_3 - CH = CH - CHO$ to CH_3-CH=CH-COOH

(a) Baeyer's reagent (b) Tollen's reagent

(c) Schiff's reagent (d) acidified dichromate.

Q.9 To differentiate between pentan-2-one and pentan-3-one a test is carried out. Which of the following is the correct answer?

(a) Pentan-2-one will give silver mirror test. (b) Pentan-2-one will give iodoform test.

(c) Pentan-3-one will give iodoform test. (d) None of these.

Q.10 An organic compound of molecular formula C_3H_6O did not give a silver mirror with Tollen's reagent but give an oxime with hydroxylamine. It may be

(a) $CH_2 = CH - CH2 - OH$ (b) CH_3COCH_3

(c) CH_3CH_2CHO (d) $CH_2 = CH - OCH_3$

Q.11 Match the column I with column II and mark the appropriate choice.

	Column I		**Column II**
(A)	$>C=O \xrightarrow{LiAlH_4}$	(i)	$-COONa$
(B)	$>C=O \xrightarrow[conc.\ HCl]{Zn/Hg}$	(ii)	$-COOH$
(C)	$>C=O \xrightarrow{Ag_2O/OH^-}$	(iii)	$>CH_2$
(D)	$>C=O \xrightarrow{NaOX}$	(iv)	$-CH_2O$

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

Q.12 Which of the following will not give aldol condensation?

(a) Phenyl acetaldehyde (b) 2- Methylpentanal

(c) Benaldehyde (d) 1- Phenylpropanone

Q.13 Identify (X), (Y) and (Z) in the given reaction.

$$X + Y \xrightarrow{Z} CH_3 - CH(OH) - CH_2 - CHO$$

3 – Hydroxybutanal

	X	Y	Z
(a)	HCHO	CH_3CHO	KOH
(b)	CH_3CHO	CH_3CHO	NaOH
(c)	CH_3CH_2OH	HCHO	H_2SO4
(d)	CH_3CH_2CHO	HCHO	Dry ether

Q.14 Fill in the reagents for the given conversion

$$CH_3COCl \xrightarrow{(X)} CH_3CHO \xrightarrow{(Y)}$$

$$CH_3 - CH(OH) - CH_2CHO \xrightarrow{(Z)} CH_3CH=CHCHO$$

	X	Y	Z
(a)	$Pd/BaSO_4$	dil.NaOH	heat
(b)	NaOH	Hydrolysis	heat
(c)	I_2/NaOH	$LiAlH_4$	H_3O^+
(d)	CrO_3	Warm	CO_2

Q.15 Which of the following compounds will undergo Cannizzaro reaction?

(a) CH_3CHO (b) CH_3COCH_3 (c) C_6H_5CHO (d) $C_6H_5CH_2CHO$

Q.16 Match the column I with column II and mark the appropriate choice.

	Column I		**Column II**
(A)	Clemmensen reduction	(i)	Conc. KOH
(B)	Rosenmund reduction	(ii)	Zn/Hg + conc. HCl
(C)	Iodoform reaction	(iii)	H_2/Pd-$BaSO_4$
(D)	Cannizzaro reaction	(iv)	NaOH + I_2

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

Q.17 Match the column I with column II and mark the appropriate choice.

	Column I		**Column II**
(A)	$RCOCH_3 \xrightarrow[HCl]{Zn-Hg} RCH_2CH_3$	(i)	Wolff-Kishner reduction
(B)	$2C_6H_5CHO \xrightarrow{NaOH} C_6H_5COONa + C_6H_5CH_2OH$	(ii)	Clemmensen reduction
(C)	$C_6H_6 + CH_3COCl \xrightarrow[AlCl_3]{Anhy.} C_6H_5COCH_3$	(iii)	Friedel-Crafts reaction
(D)	$C_6H_{10}O \xrightarrow[KOH/\,ethylene]{(i)\,NH_2NH_2} C6H_{12} + N_2$	(iv)	Cannizzaro reaction

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

Q.18 An organic compound (X) with molecular formula $C_9H_{10}O$ gives positive 2,4-DNP and Tollen's tests.

It undergoes Cannizzaro reaction and on vigorous oxidation it gives. 1,4-benzenedicarboxylic acid Compound (X) is

(a) benzaldehyde (b) o-methylbenzaldehyde

(c) p-ethylbenzaldehyde (d) 2, 2-dimethylhexanal.

Q.19 Which of the following will not yield acetic acid on strong oxidation?

(a) Butanone (b) Propanone (c) Ethyl ethanoate (d) Ethanol

Q.20 An aromatic compound (X) (C_8H_8O) gives positive 2,4-DNP test. It gives a yellow precipitate of Compound (Y) on reaction with iodine and sodium hydroxide solution. (X) does not give Tollen's test On oxidation under drastic condition carboxylic acid (Z) ($C_7H_6O_2$) is obtained

(Z) is also formed with (Y) during the reaction. (X),(Y) and (Z) Respectively are

(a) $C_6H_5COCH_3$, CHI_3, C_6H_5COOH (b) CH_3COCH_3, CHI_3, CH_3COOH

(c) $C_6H_5COCH_3$, CHI_3, CH_3COOH (d) CH_3CHO, CHI_3, C_6H_5COOH

Q.21 Carboxylic acids dimerise due to

(a) High molecular weight (b) Coordinate bonding

(c) Intermolecular hydrogen bonding (d) Covalent bonding

Q.22 Which of the following is the correct order of relative strength of acids?

(a) $ClCH_2COOH > BrCH_2COOH > FCH_2COOH$ (b) $BrCH_2COOH > ClCH_2COOH > FCH_2COOH$

(c) $FCH_2COOH > ClCH_2COOH > BrCH_2COOH$ (d) $ClCH_2COOH > FCH_2COOH > BrCH_2COOH$

Q.23 What happens when a carboxylic acid is treated with lithium aluminium hydride?

(a) Aldehyde is formed (b) Primary alcohol is formed

(c) Ketone is formed. (d) Grignard reagent is formed.

Q.24 Which of the following will not undergo HVZ reaction?

(a) Propanoic acid (b) ethanoic acid

(c) 2-Methylpropanoic acid (d) 2,2-Dimethylpropanoic acid

Q.25 In the following sequence of reaction, the final product (Z) is

$$CH \equiv CH \xrightarrow[H_2SO_4]{Hg^{2+}} X \xrightarrow[H_2O]{CH_3MgX} Y \xrightarrow{[O]} Z$$

(a) Ethanal (b) Propan – 2-ol (c) Propanone (d) Propan – 1- ol

Directions : In the following questions, a statement of assertion is following by a statement of reason.

Mark the correct choice as:

(a) If both assertion and reason are true and reason is the correct explanation of assertion.

(b) If both assertion and reason are true but reason is not the correct explanation of assertion.

(c) If assertion is true but reason is false.

(d) If both assertion and reason are false.

Q.26 Assertion : In formaldehyde all the four atoms lie in one plane.

Reason : Carbonyl carbon forms a π- bond with oxygen by overlapping of *p*- orbitals.

Q.27 Assertion : Acetaldehyde is more reactive than acetone in nucleophilic addition reactions.

Reason : Two alkyl groups in acetone reduce the electrophilicity of the carbon.

Q.28 Assertion : **β -** Hydrogen atom of carbonyl compounds is acidic in nature.

Reason : **β -** Hydrogen is directly attached to carbon next to carbonyl carbon.

Q.29 Assertion : Aromatic aldehydes and ketones undergo electrophilic substitution reaction at meta position

Reason : Carbonyl group activates the ring towards electrophilic substitution reactions.

Q.30 Assertion : Phenol and benzoic acid can be distinguished by Na_2CO_3 .

Reason : Benzoic acid is stronger acid than phenol, hence reacts with Na_2CO_3 .

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ANSWER KEY

QUE.	ANS.	QUE.	ANS.	QUE.	ANS.
1	C	11	B	21	C
2	B	12	C	22	C
3	A	13	B	23	B
4	A	14	A	24	D
5	B	15	C	25	C
6	C	16	C	26	B
7	B	17	A	27	A
8	B	18	C	28	D
9	B	19	C	29	C
10	B	20	A	30	A