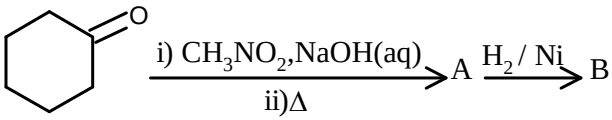
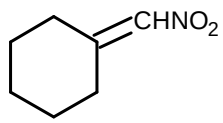
IIT – JEE-2019 | **CRASH COURSE(ADV.)** | **MARKS:124**
TIME: 75 MIN. | **TOPIC: ALDEHYDE KETONES** | **DATE:15/11/18**

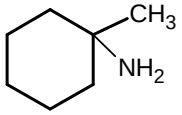
SECTION–I (Multiple Choice Questions)

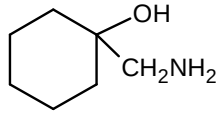
This section contains **06 multiple choice questions.** Each question has 4 choices (A), (B), (C) and (D) for its answer, out which **ONLY ONE** is correct. **(+3, -1)**

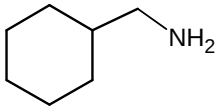
1. The product (B) formed in the reaction sequence



(A) 

(B) 

(C) 

(D) 

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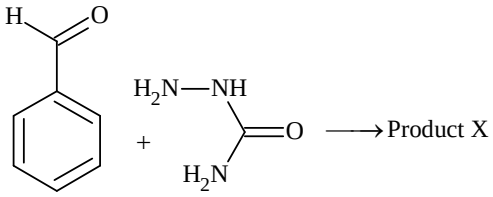
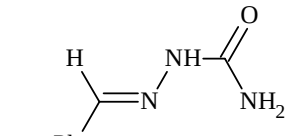
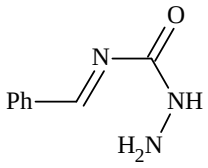
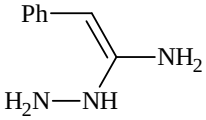
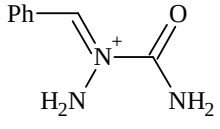


Product X is:

(A) 

(B) 

(C) 

(D) 

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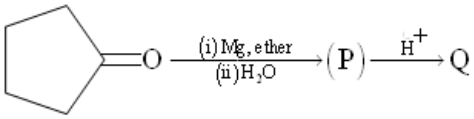
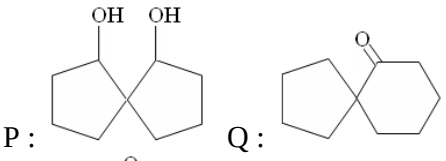
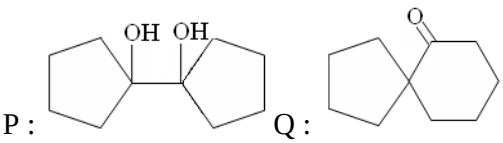
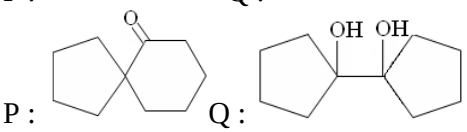
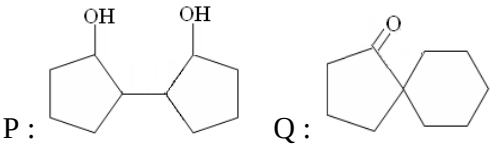


(A) 

(B) 

(C) 

(D) 

4. The compound $CH_3—CH = CH—CHO$ is treated with sufficient OD^- in presence of D_2O. Which of the following is not likely to be present at all when equilibrium is reached?

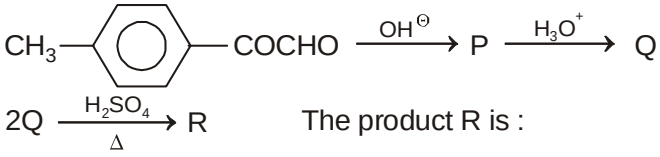
(A) $H_2C(D)—CH=CH—CHO$

(B) $H_2C=CH—CH(D)—CHO$

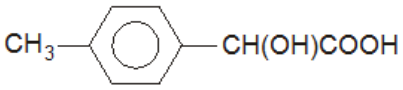
(C) $H_3C—C(D)=CH—CHO$

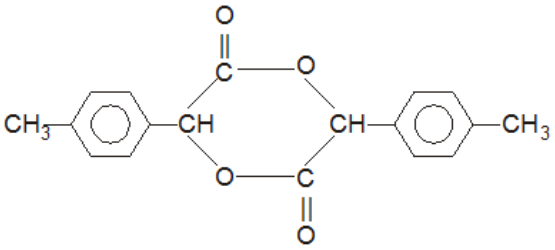
(D) $D_3C—CH=C(D)—CHO$

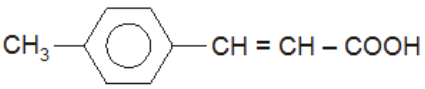
5.

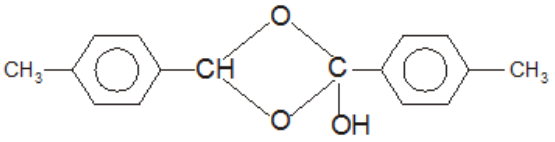


The product R is :

(A) 

(B) 

(C) 

(D) 

6. $PhCHO + (CH_3CO)_2O \xrightarrow{CH_3COONa} A \xrightarrow{HBr} B$

The product B is

(A) $PhCH = CHCH_2Br$

(B) $PhCH(Br) – CH_2 – COOH$

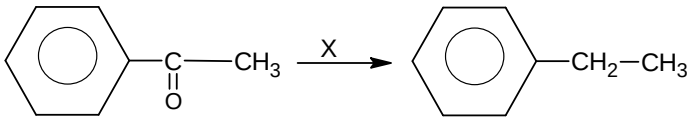
(C) $PhCH_2CH(Br)COOH$

(D) $PhCH = CH – COBr$

SECTION-II (Multiple Choice Questions)

This section contains **06 multiple choice questions.** Each question has 4 choices (A), (B), (C) and (D) for its answer, out which **ONE OR MORE** is/are correct. **(+4, - 2)**

7.

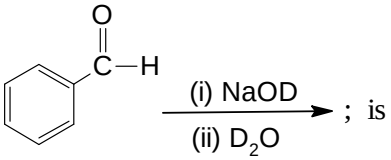


In this conversion reagent (X) could be

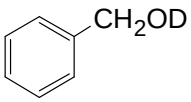
(A) N_2H_4, OH^- (B) Red P/HI

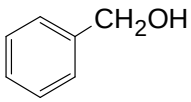
(C) $(CH_2SH)_2$; Raney Ni, H_2 (D) $Zn(Hg)$; con HCl

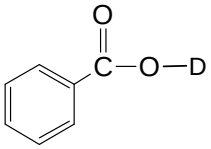
8. The products of the following reaction are,

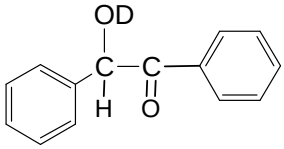


; is

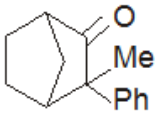
(A) 

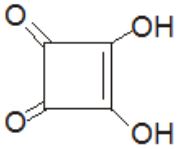
(B) 

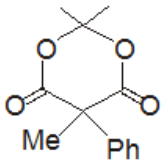
(C) 

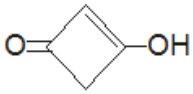
(D) 

9. Which one of the following compound will not show enolisation?

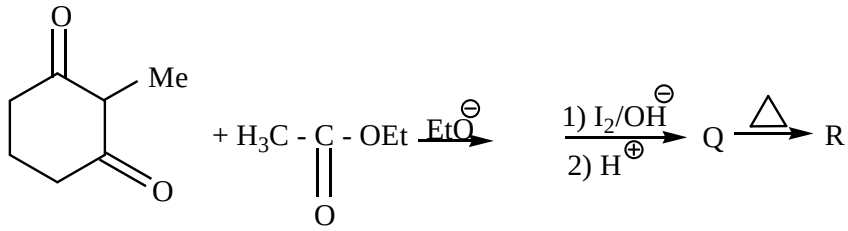
(A) 

(B) 

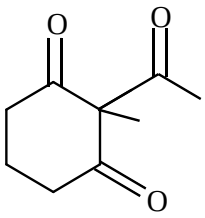
(C) 

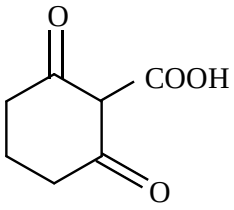
(D) 

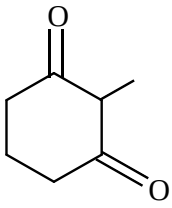
10.

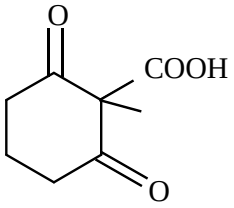


The compounds of the above reaction sequence is/are

(A) 

(B) 

(C) 

(D) 

11. Which of the following responds to iodoform test with $NaOH/I_2$?

(A) $CH_3COC_2H_5$ (B) CH_3COOH

(C) $H_3C-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_3$ (D) $Ph-\overset{\displaystyle O}{\overset{\|}{C}}-CH_3$

12. $2CH_3-CHO \xrightarrow[I]{\bar{O}H/H_2O} \underset{(Aldol)}{A} \xrightarrow[II]{\Delta}$ crotanaldehyde. The correct statement is/are

(A) Step - I is nucleophilic addition

(B) Step-I is nucleophilic substitution,

(C) Step-II is elimination by E_1 Mechanism

(D) Step - II is elimination by E_{1CB} Mechanism

SECTION – III (Paragraph Type)

This section contains **2 multiple choice questions** relating to 1 paragraph. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE is correct.** **(+3, -1)**

PARAGRAPH FOR QUE. NOS. 13 & 14.

$$CH_3CHO \xrightarrow[NH_4Cl(aq)]{NaCN} A \xrightarrow{NH_3} B \xrightarrow[HCl]{H_2O} C$$

13. Which of the following are optically active.

(A) A & B (B) B & C (C) C & A (D) A,B & C

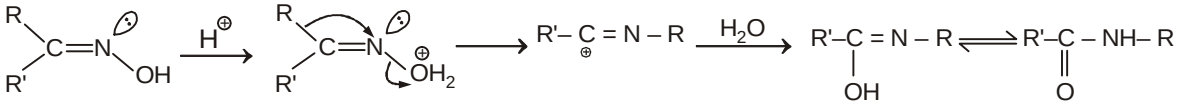
14. C is

(A) $CH_3-\underset{\displaystyle OH}{\underset{|}{CH}}-COOH$ (B) $CH_3-\underset{\displaystyle NH_2}{\underset{|}{CH}}-COOH$

(C) $CH_3-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_2Cl$ (D) $CH_3-\underset{\displaystyle NH_2}{\underset{|}{CH}}-CH_2Cl$

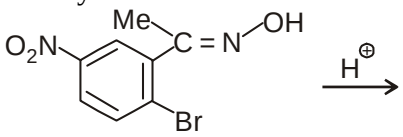
PARAGRAPH FOR QUE. NOS 15 & 16

Aldehydes and Ketones reacts with NH_2OH to form Aldoximes and Ketoximes respectively. Configuration of these can be determined bu Beckmined by Beckmann rearrangement as that group migartes which is anti w.r.t – OH.

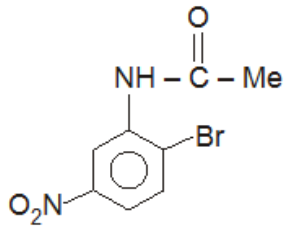


It is interisting to note that the migration of group is completely Retentive and no loss of optical activity is seen.

15.



(A)



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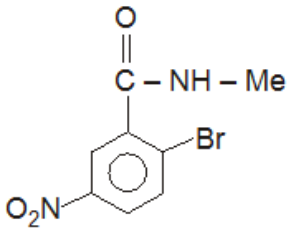

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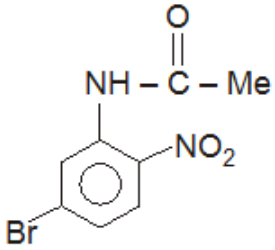

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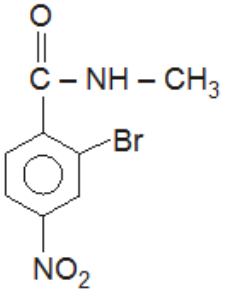

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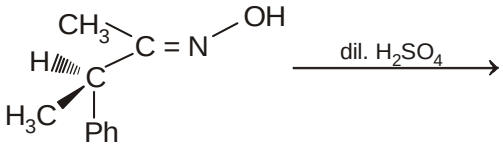


(+) dextrorotatory

Following is true about product

(A) It is also (+) laevorotatory

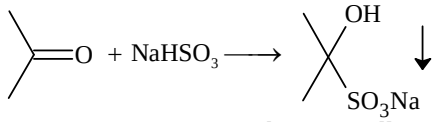
(B) Both (+) (–) forms are obtained in equal amount

(C) It is having 'S' configuration for chiral carbon

(D) It is having R configuration for chiral carbon.

PARAGRAPH FOR QUE. NOS 17 & 18

Carbonyl compounds react with sodium bisulphite to form a white crystalline ppt of sodium sulphite addition product. The reaction is a nucleophilic addition on carbon-oxygen double bond.



white crystalline solid

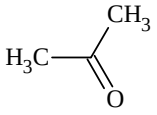
The nucleophile in the reaction being bulky, sterically hindered ketones do not respond to this reaction. The bisulphite addition product is unstable to mineral acid and it gets revert back to original carbonyl compound upon treatment with mineral acid.

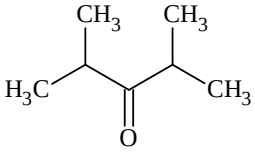
17. The nucleophile in the reaction between carbonyl compound and sodium bisulphite is

(A) SO_3^-Na (B) SO_3^-H (C) SO_3^{2-} (D) SO_3

18. Which of the following compounds will not react with $NaHSO_3$?

(A) CH_3CHO (B) PhCHO

(C) 

(D) 

SECTION – IV (Integer Answer Type)

This section contains **08** questions. The answer to each of the questions is a **single digit integer,** ranging from 0 to 9. The correct digit below the question number in the ORS is be bubbled. **(+4, 0)**

19. How many of the following will give faster rate of cyanohydrins formation than benzaldehyde?

(i) p-methoxy benzaldehyde (ii) p-cyano benzaldehyde
(iii) p-nitrobenzaldehyde (iv) p-methylbenzaldehyde
(v) acetaldehyde (vi) acetophenone
(vii) benzophenone (viii) p-chlorobenzaldehyde

20.

$$Ph-CH=CH-\overset{\overset{O}{\|}}{C}-CH=CH-Ph$$

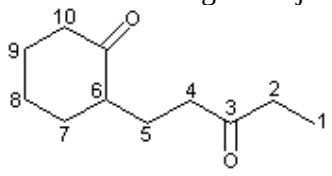
$CH_2(COOEt)_2$, $NaOEt$, $(1Mole)$ ↓

(A)

$(Six\ membered\ ring)$

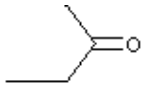
How many oxygen atoms are present in (A)?

21. In the following compound which numbered carbon atom enters into intramolecular aldol condensation to give major product



x is_____

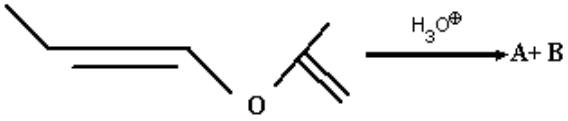
22.



$+H_2N-NH_2 \rightarrow$ product.

Number of isomeric hydrazone products in above reaction is/are____

23.



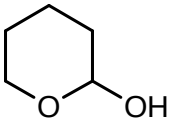
compounds A & B can be differentiated by how many of the following reagents ?

Brady's Reagent ; Fehlings Solution ; Hinsberg Reagent ;

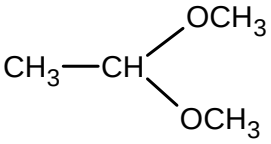
$CaOCl_2$ (aq) ; NaOI ; $NaHSO_3$; Tollen's Reagent

24. How many of the following compounds would give a positive Tollen's test?

(I) CH_3-CHO

(II) 

(III) $CH_3-CH_2-CH_2-CH_2-CH(OH)OCH_3$

(IV) 

(V) CH_3COOH,

(VI) HCOOH

(VII) CHOCOOH

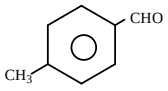
(VIII) CHOCHO

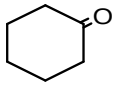
(IX) CH_3COCH_2OH

(X) $CH_3COCH(OH)CH_3$

25. The number of compounds give positive Fehling test

(1) CH_3-CHO (2) CH_3-CH_2-CHO (3) $Ph-CHO$ (4) CH_3COCH_3

(5) OHC-CHO (6) 

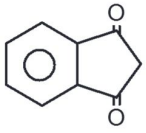
(7) $Ph-CH_2-CHO$ (8) 

26. How many of the following compounds can give iodoform Test?

(1) CH_3-CHO (2) CH_3COCH_3

(3) $CH_3-CH_2-CO-CH_2-CH_3$ (4) CH_3CH_2OH

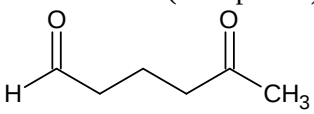
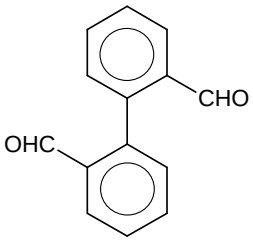
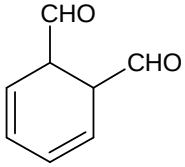
(5) $Ph-CHOH-CH_3$ (6) $CH_3\text{-}\overset{\overset{O}{\|}}{C}\text{-}CH_2\text{-}COCH_3$

(7) $CH_3-CO-CH_2-COOEt$ (8) 

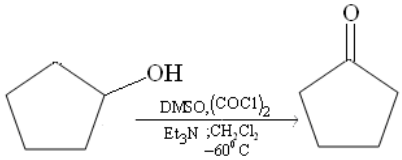
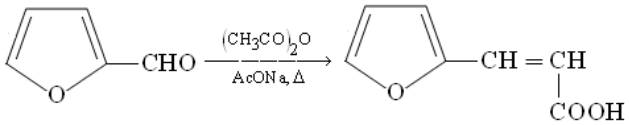
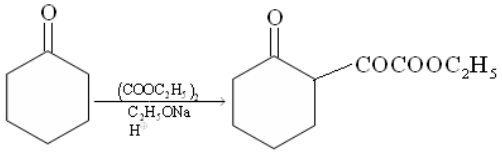
SECTION - V (Matrix Match Type)

This section **1** Question. Each question has four statements Given in **Column - I** and four statements in **Column – II**. Any given statement in **Column – I** can have correct matching with one or more statement (s) given in **column II**. **(+8, 0)**

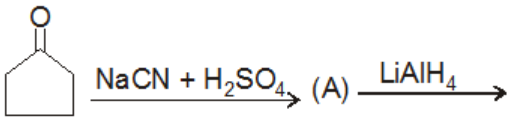
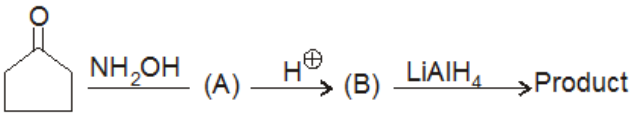
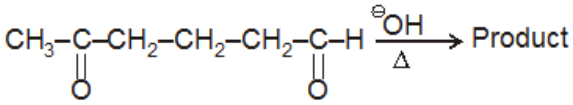
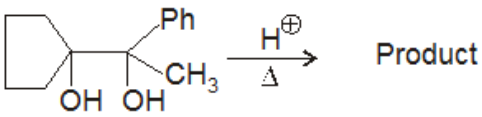
27. Match the Following:

Column I (Compound)	Column II (Reaction / test shown by the compound)
(A) 	(P) Tollen's Test
(B) $(CHO)_2$	(Q) Fehling's Test
(C) 	(R) Intramolecular Cannizzaro's reaction
(D) 	(S) Intramolecular aldol condensaiton
	(T) Haloform Test

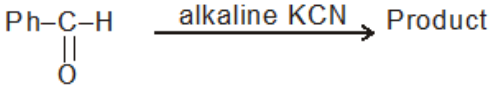
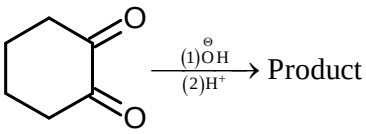
28. Match the following

Column I	Column II
(A) 	(p) Aldol condensation
(B) $C_6H_5CHO \xrightarrow[\ominus\ OH]{CH_3CHO} C_6H_5CH=CHCHO$	(q) Perkins reaction
(C) 	(r) Swern oxidation
(D) 	(s) Cross Claisen condensation

29. Match the Following:

	Column I	Column II
(A)		(p) Formation of six member ring take place
(B)	(B) $\xrightarrow{HNO_2}$ Product 	(q) Final product is ketone
(C)		(r) Final product formed will give positive tollen's test
(D)		(s) Final product will react with 2, 4 DNP

30. Match the Following:

	Column I	Column II
(A)		(p) Final product formed give positive tollen test
(B)		(q) Final product give test with 2, 4 DNP
(C)	$CH_3-\underset{\underset{O}{\|}}{C}-OEt \xrightarrow[(2)H_3O^+,\Delta]{(1)C_2H_5ONa}$ Product	(r) Final product react with $NaHCO_3$ and liberated CO_2 gas
(D)	$Ph-CH=O \xrightarrow[(2)H^+]{(1)KOH}$ Product	(s) Final product react with Na and liberated H_2 gas

TOPIC: (ANSWER KEY)

1.	**(D)**	**2.**	**(A)**	**3.**	**(B)**	**4.**	**(C)**	**5.**	**(B)**
6.	**(B)**	**7.**	**(ABCD)**	**8.**	**(AC)**	**9.**	**(ABCD)**	**10.**	**(ACD)**
11.	**(ACD)**	**12.**	**(AD)**	**13.**	**(D)**	**14.**	**(B)**	**15.**	**(A)**
16.	**(D)**	**17.**	**(C)**	**18.**	**(D)**	**19.**	**(4)**	**20.**	**(5)**
21.	**(2)**	**22.**	**(2)**	**23.**	**(4)**	**24.**	**(8)**	**25.**	**(3)**

26. **(6)**

27. **(**A – PQST; B – PR; C – P; D – PQ)

28. **(**A – R; B – P; C – Q; D – S)

29. **(**A-PQS; B-P; C-PQS; D-PQS**)**

30. **(**A-PQS; B-RS; C-Q; D-RS**)**