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12. Aldehydes, Ketones and Carboxylic Acids

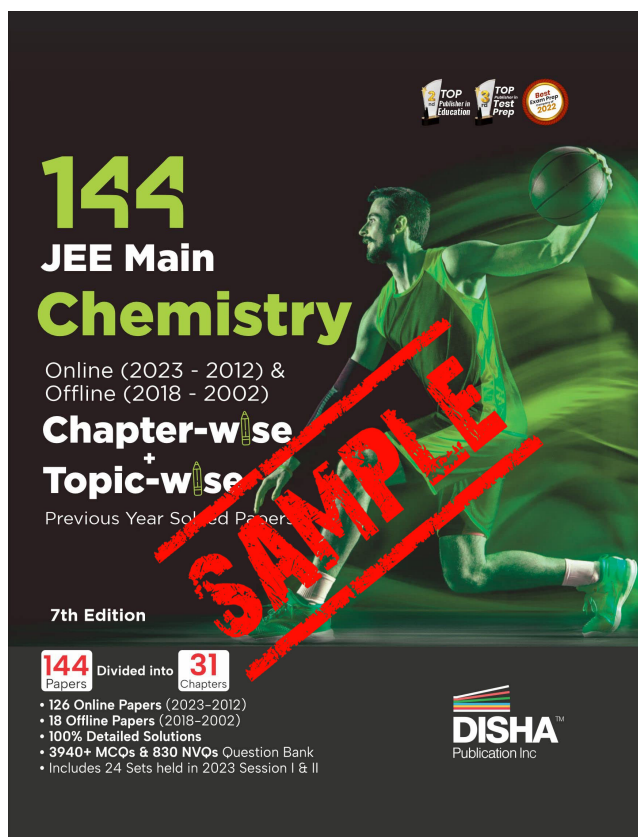
B117 - B145

Topic 1: Methods of Preparation of Carbonyl Compounds

Topic 2: Properties of Carbonyl Compounds

Topic 3: Preparation and Properties of Carboxylic Acids and their Derivatives

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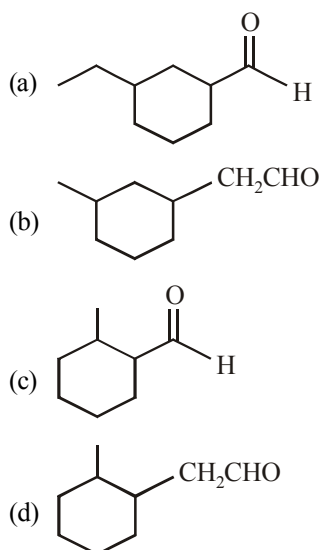
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Aldehydes, Ketones and Carboxylic Acids

Topic 1

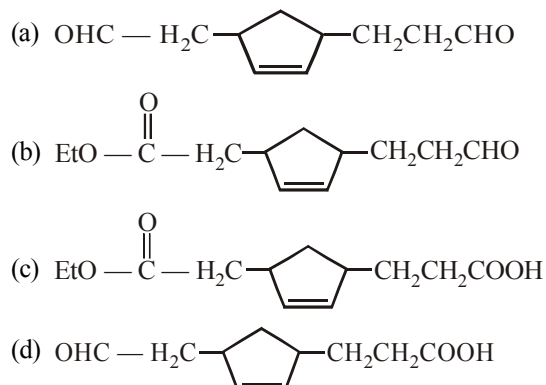
Methods of Preparation of Carbonyl Compounds

1. Correct structure of γ -methylcyclohexane carbaldehyde is : [July 29, 2022 (II)]

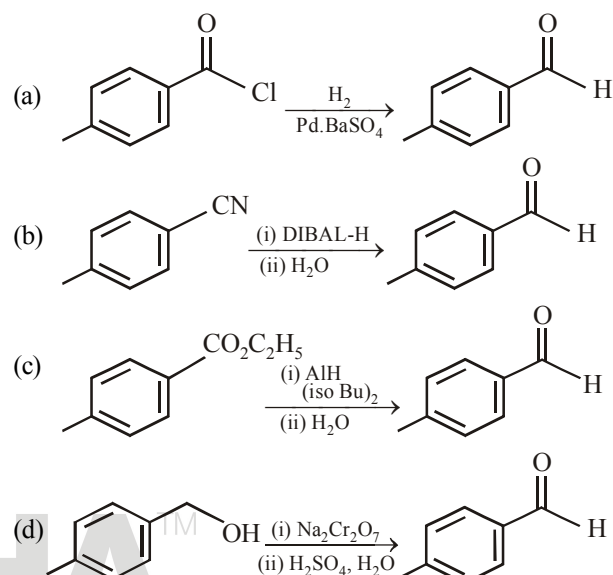


2. $\text{EtO}-\text{C}(=\text{O})-\text{H}_2\text{C}-\text{C}_5\text{H}_7-\text{CH}_2\text{CH}_2\text{CN} \xrightarrow[\text{(ii) H}_2\text{O}]{\text{(i) DiBAL-H}} ?$

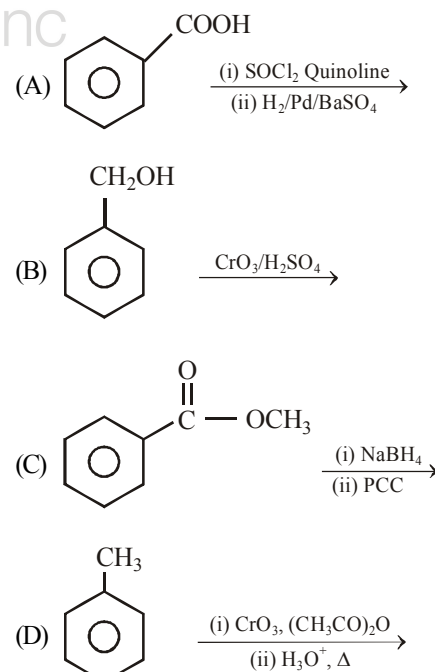
Consider the above reaction and predict the major product. [July 26, 2022 (II)]



3. Which one of the following reactions does **not** represent correct combination of substrate and product under the given conditions? [July 25, 2022 (I)]



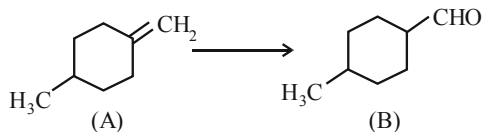
4. Which of the following reactions will yield benzaldehyde as a product? [June 27, 2022 (I)]



- (a) (B) and (C) (b) (C) and (D)
- (c) (A) and (D) (d) (A) and (C)

5. Which of the following reagents/ reactions will convert 'A' to 'B'?

[June 24, 2022 (II)]



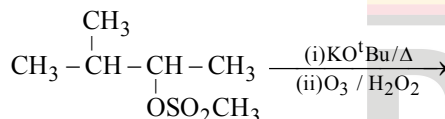
- (a) PCC oxidation
 (b) Ozonolysis
 (c) BH_3 , H_2O_2 / $^- \text{OH}$ followed by PCC oxidation
 (d) HBr , hydrolysis followed by oxidation by $\text{K}_2\text{Cr}_2\text{O}_7$.
6. Which one of the following reactions will not form acetaldehyde?

[Feb. 25, 2021 (I)]

- (a) $\text{CH}_3\text{CH}_2\text{OH} \xrightarrow{\text{CrO}_3-\text{H}_2\text{SO}_4}$
 (b) $\text{CH}_2 = \text{CH}_2 + \text{O}_2 \xrightarrow[\text{H}_2\text{O}]{\text{Pd(II)/Cu(II)}}$
 (c) $\text{CH}_3\text{CH}_2\text{OH} \xrightarrow[573\text{K}]{\text{Cu}}$
 (d) $\text{CH}_3\text{CN} \xrightarrow[\text{(ii) H}_2\text{O}]{\text{(i) DIBAL-H}}$

7. The major products of the following reaction are:

[Sep. 06, 2020 (I)]



- (a) $\text{CH}_3-\text{CH}(\text{CH}_3)-\text{C}(=\text{O})-\text{CH}_3 + \text{CH}_3\text{CHO}$
 (b) $\text{CH}_3-\text{CH}(\text{CH}_3)-\text{C}(=\text{O})-\text{CH}_3 + \text{CH}_3\text{COOH}$
 (c) $\text{CH}_3-\text{CH}(\text{CH}_3)-\text{CHO} + \text{HCHO}$
 (d) $\text{CH}_3-\text{CH}(\text{CH}_3)-\text{COOH} + \text{HCOOH}$

8. The correct match between Item - I (starting material) and Item - II (reagent) for the preparation of benzaldehyde is :

[Sep. 06, 2020 (II)]

Item - I**Item - II**

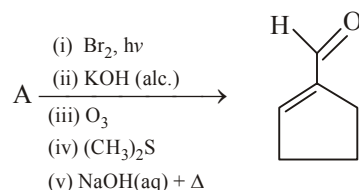
- | | |
|------------------------|---|
| (I) Benzene | (P) HCl and SnCl_2 , H_3O^+ |
| (II) Benzonitrile | (Q) H_2 , $\text{Pd}-\text{BaSO}_4$, S and quinoline |
| (III) Benzoyl chloride | (R) CO , HCl and AlCl_3 |
- (a) (I) - (Q), (II) - (R) and (III) - (P)
 (b) (I) - (P), (II) - (Q) and (III) - (R)

- (c) (I) - (R), (II) - (P) and (III) - (Q)

- (d) (I) - (R), (II) - (Q) and (III) - (P)

9. In the following reaction A is:

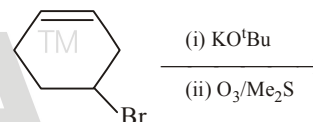
[Jan. 09, 2020 (II)]



- (a) (b)
 (c) (d)

10. The major product(s) obtained in the following reaction is/are :

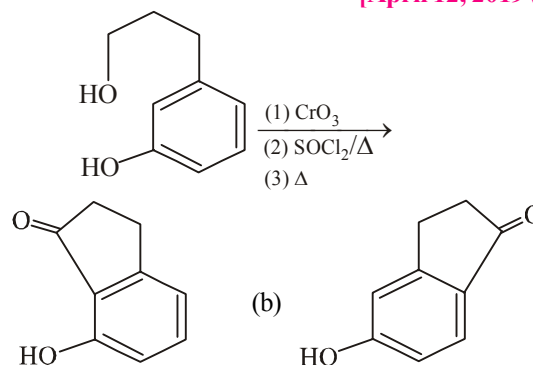
[April 12, 2019 (I)]

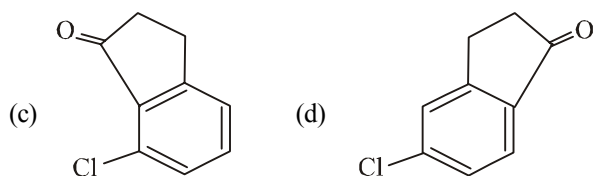


- (a) $\text{OHC}-\text{CH}_2-\text{CH}_2-\text{CHO}$ and $\text{OHC}-\text{CHO}$
 (b) $\text{OHC}-\text{CH}_2-\text{CH}_2-\text{CH}=\text{CH}-\text{CHO}$
 (c) $\text{OHC}-\text{CH}_2-\text{CHO}$
 (d) $\text{OHC}-\text{CH}_2-\text{CH}(\text{O}^t\text{Bu})-\text{CH}_2-\text{CH}_2-\text{CHO}$

11. The major product of the following reaction is:

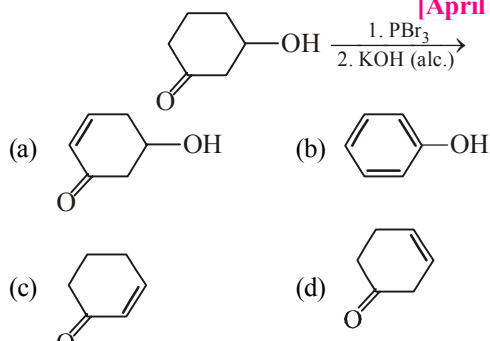
[April 12, 2019 (I)]





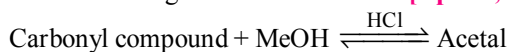
12. The major product of the following reaction is:

[April 9, 2019 (I)]



13. In the following reaction

[April 9, 2019 (II)]

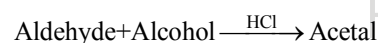


Rate of the reaction is the highest for:

- (a) Acetone as substrate and methanol in excess.
 (b) Propanal as substrate and methanol in stoichiometric amount.
 (c) Propanal as substrate and methanol in excess.
 (d) Acetone as substrate and methanol in stoichiometric amount.

14. In the following reaction

[Jan. 12, 2019 (I)]



Aldehyde Alcohol

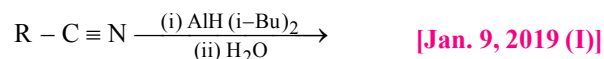
HCHO ^tBuOH

CH₃CHO MeOH

The best combination is:

- (a) CH₃CHO and ^tBuOH (b) HCHO and MeOH
 (c) CH₃CHO and MeOH (d) HCHO and ^tBuOH

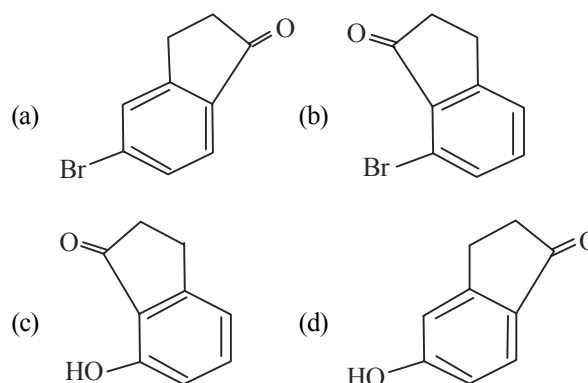
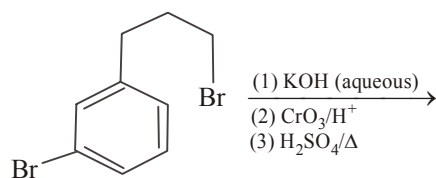
15. The major product of the following reaction is:



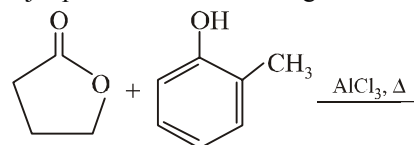
- (a) RCOOH (b) RCONH₂ (c) RCHO (d) RCH₂NH₂

16. The major product of the following reaction is:

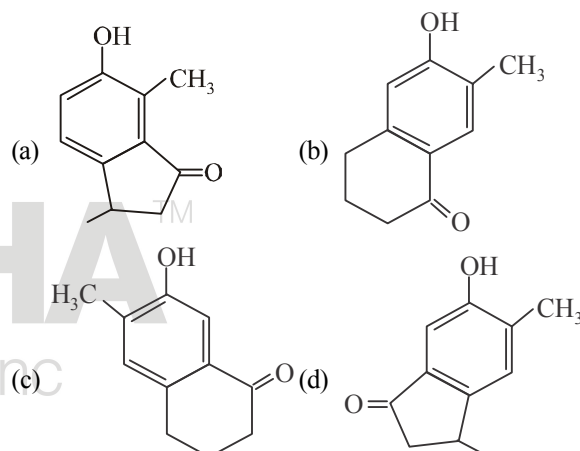
[Jan. 9, 2019 (I)]



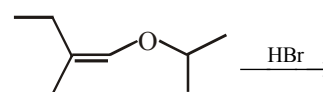
17. The major product of the following reaction is:



[Jan. 9, 2019 (II)]

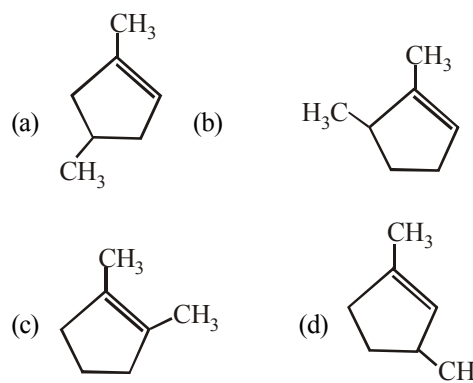


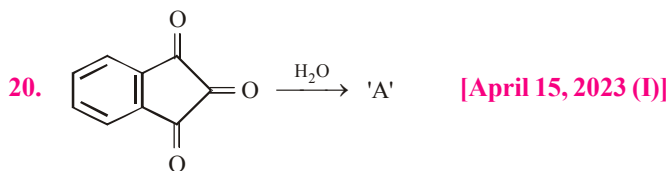
18. The total number of optically active compounds formed in the following reaction is: [Online April 15, 2018 (II)]



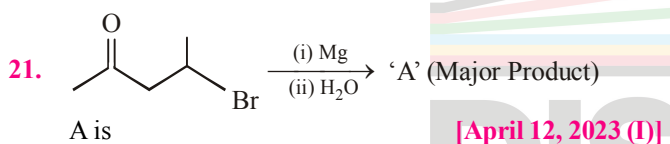
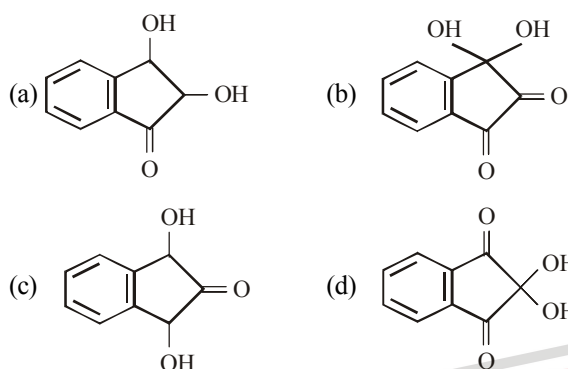
- (a) Zero (b) Six (c) Four (d) Two

19. Which compound would give 5-keto-2-methylhexanal upon ozonolysis? [2015]

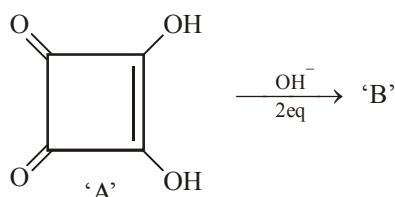
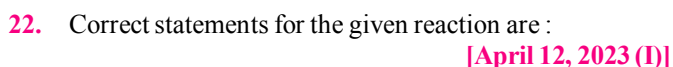
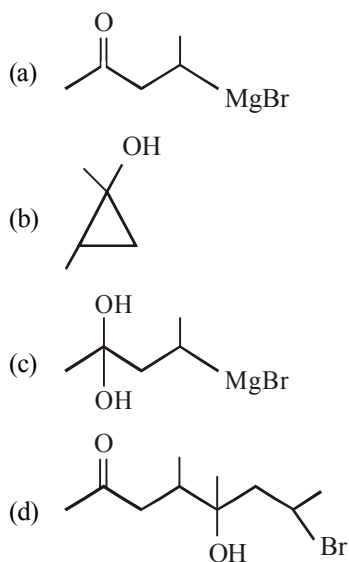


Topic 2 Properties of Carbonyl Compounds


major product 'A' formed in the above reaction is



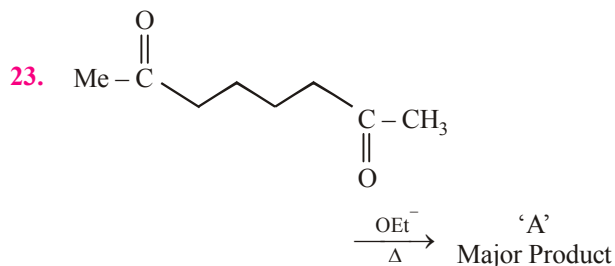
A is



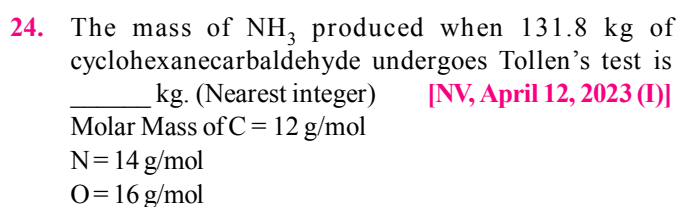
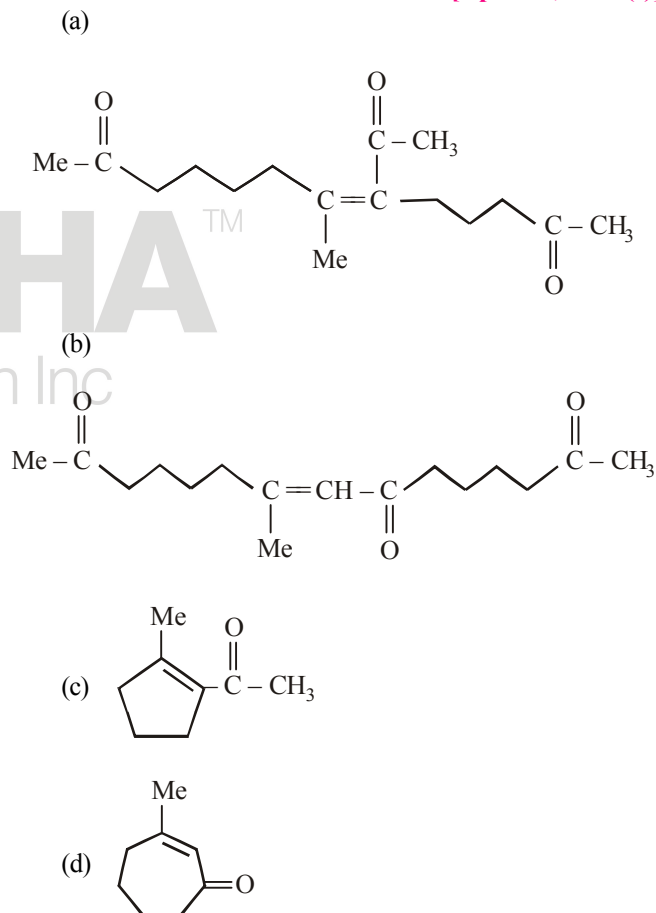
- A. Compound 'B' is aromatic
B. The completion of above reaction is very slow
C. 'A' shows tautomerism
D. The bond lengths C-C in compound B are found to be same

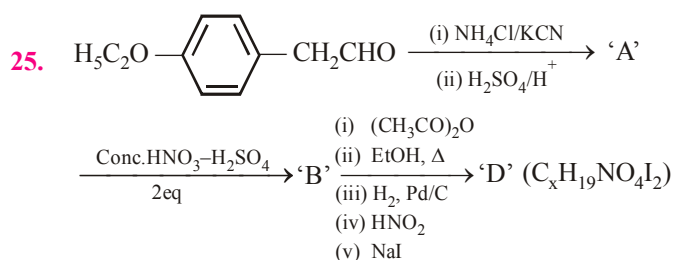
Choose the correct answer from the options given below:

- (a) A, B and D only (b) A, B and C only
(c) B, C and D only (d) A, C and D only



A in the above reaction is : [April 12, 2023 (I)]

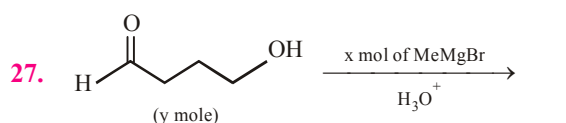
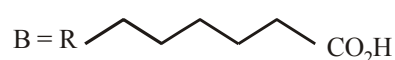
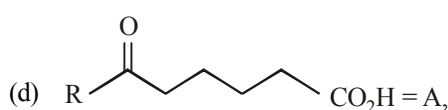
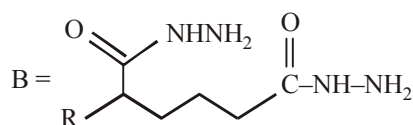
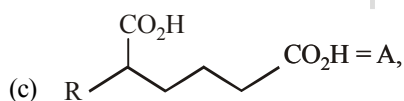
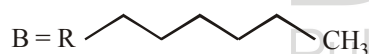
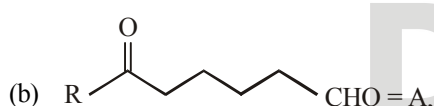
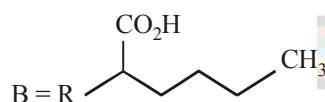
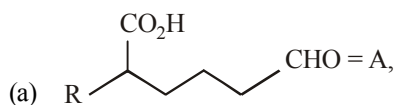
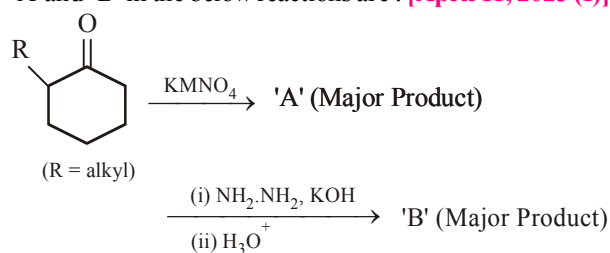




The value of x in compound 'D' is _____

[NV, April 12, 2023 (I)]

26. 'A' and 'B' in the below reactions are : [April 11, 2023 (I)]

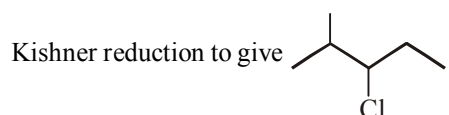
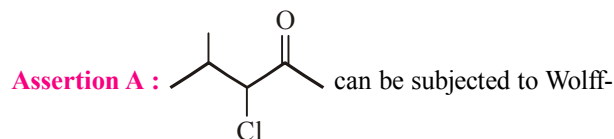


The ratio x/y on completion of the above reaction is _____.

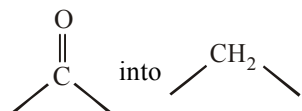
[NV, April 11, 2023 (I)]

28. Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R.

[April 11, 2023 (II)]



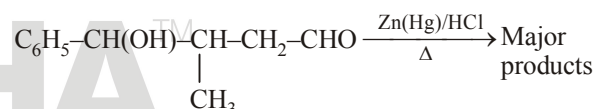
Reason R : Wolff-Kishner reduction is used to convert



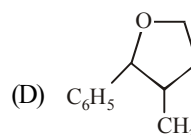
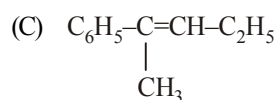
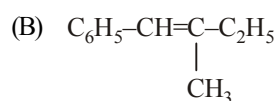
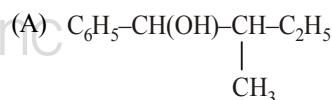
In the light of the above statements, choose the correct answer from the options given below :

- (a) Both A and R are true but R is NOT the correct explanation of A.
 (b) A is true but R is false.
 (c) A is false but R is true.
 (d) Both A and R are true and R is the correct explanation of A.

29. The major product formed in the following reaction is:



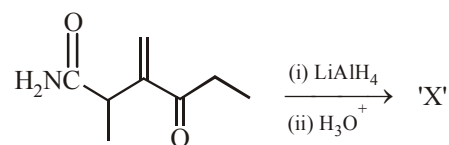
[April 11, 2023 (II)]



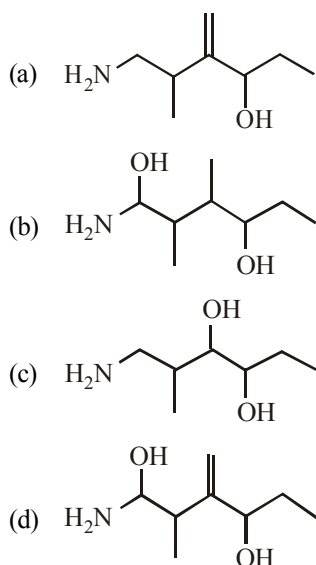
Choose the correct answer from the options given below:

- (a) A only (b) B only (c) C only (d) D only

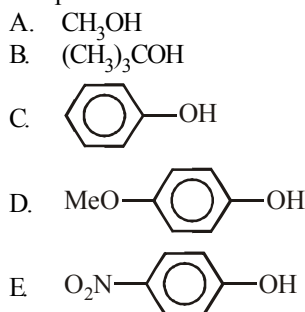
30. In the reaction given below: [April 10, 2023 (II)]



The product 'X' is:



31. The correct order for acidity of the following hydroxyl compound is: [April 10, 2023 (II)]



Choose the correct answer from the options given below:

- (a) $\text{E} > \text{C} > \text{D} > \text{A} > \text{B}$ (b) $\text{D} > \text{E} > \text{C} > \text{A} > \text{B}$
 (c) $\text{C} > \text{E} > \text{D} > \text{B} > \text{A}$ (d) $\text{E} > \text{D} > \text{C} > \text{B} > \text{A}$

32. Match List I with List II [April 06, 2023 (I)]

| List I Name of reaction | List II Reagent used |
|----------------------------------|---|
| A Hell-Volhard-Zelinsky reaction | I. $\text{NaOH} + \text{I}_2$ |
| B Iodoform reaction | II. (i) CrO_2Cl_2 , CS_2 (ii) H_2O |
| C Etard reaction | III. (i) Br_2 /red phosphorus (ii) H_2O |
| D Gatterman-Koch reaction | IV. CO , HCl , anhyd. AlCl_3 |

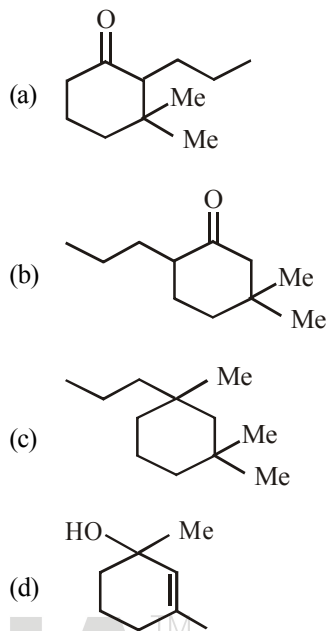
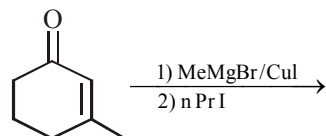
Choose the correct answer from the options given below:

- (a) A-III, B-II, C-I, D-IV (b) A-III, B-I, C-IV, D-II
 (c) A-I, B-II, C-III, D-IV (d) A-III, B-I, C-II, D-IV

33. Among the following, the number of compounds which will give positive iodoform reaction is _____. [NV, April 06, 2023 (II)]

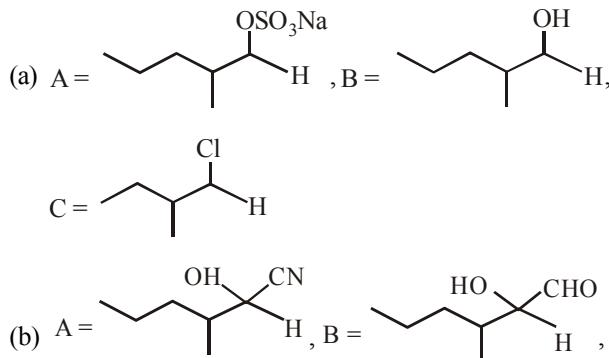
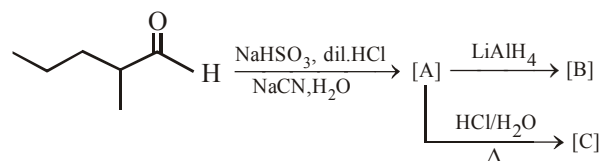
- (1) 1-Phenylbutan-2-one (2) 2-Methylbutan-2-ol
 (3) 3-Methylbutan-2-ol (4) 1-Phenylethanol
 (5) 3,3-dimethylbutan-2-one (6) 1-Phenylpropan-2-ol

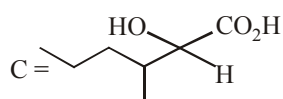
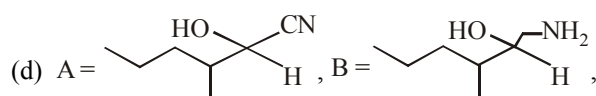
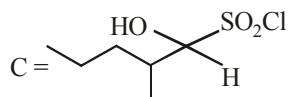
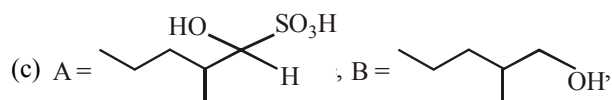
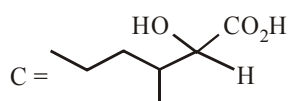
34. Find out the major product from the following reaction



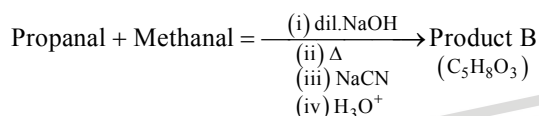
35. Number of isomeric compounds with molecular formula $\text{C}_9\text{H}_{10}\text{O}$ which (i) do not dissolve in NaOH (ii) do not dissolve in HCl . (iii) do not give orange precipitate with 2,4-DNP (iv) on hydrogenation give identical compound with molecular formula $\text{C}_9\text{H}_{12}\text{O}$ is _____. [NV, Feb. 01, 2023 (I)]

36. The structures of major products A, B and C in the following reaction sequence are. [Feb. 01, 2023 (II)]





37. Consider the following reaction [Jan. 31, 2023 (I)]

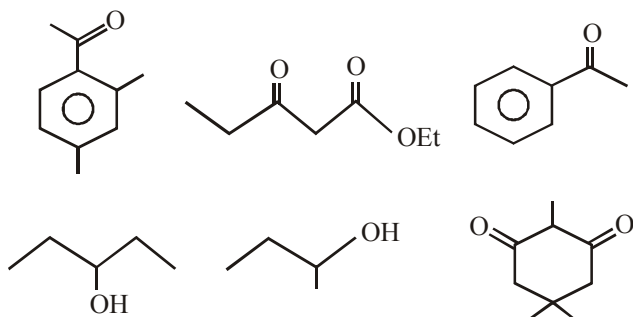


The correct statement for product B is. It is

- (a) optically active and adds one mole of bromine
- (b) racemic mixture and is neutral
- (c) racemic mixture and gives a gas with saturated NaHCO₃ solution
- (d) optically active alcohol and is neutral

38. The number of molecules which gives haloform test among the following molecules is _____.

[NV, Jan. 31, 2023 (II)]



39. Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R.

Assertion A : can be easily reduced using Zn-

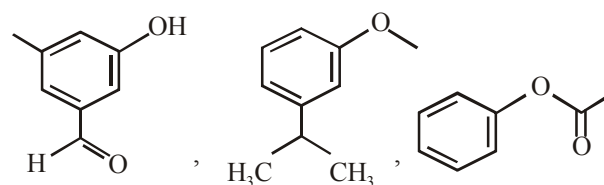
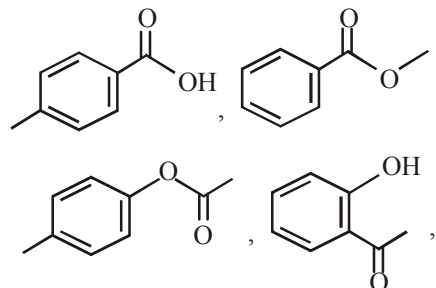
Hg/HCl to

Reason R : Zn-Hg/HCl is used to reduce carbonyl group to -CH₂- group.

In the light of the above statements, choose the correct answer from the options given below: [Jan. 30, 2023 (II)]

- (a) A is false but R is true
- (b) A is true but R is false
- (c) Both A and R are true but R is not the correct explanation of A
- (d) Both A and R are true and R is the correct explanation of A

40. Number of compounds from the following which will not dissolve in cold NaHCO₃ and NaOH solutions but will dissolve in hot NaOH solution is _____. [NV, Jan. 30, 2023 (II)]

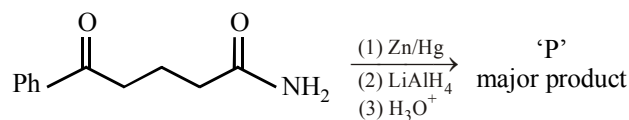


41. Match List I with List II. [Jan. 29, 2023 (I)]

| List-I Reaction | List-II Reagents |
|-----------------------------|---|
| (A) Hoffmann degradation | (I) Conc. KOH, Δ |
| (B) Clemmensen reduction | (II) CHCl ₃ , NaOH/H ₃ O ⁺ |
| (C) Cannizzaro reaction | (III) Br ₂ , NaOH |
| (D) Reimer-Tiemann reaction | (IV) Zn-Hg/HCl |

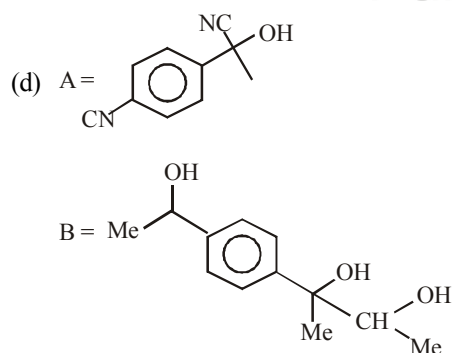
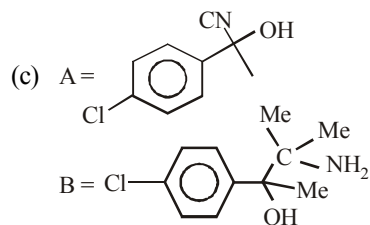
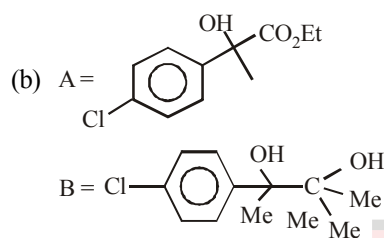
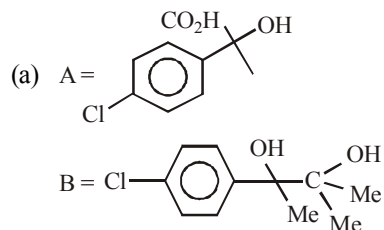
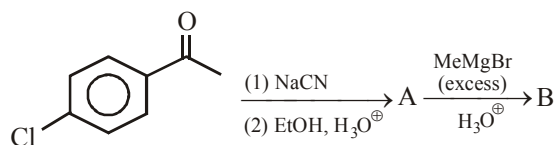
- (a) (A) – III, (B) – IV, (C) – II, (D) – I
- (b) (A) – II, (B) – IV, (C) – I, (D) – III
- (c) (A) – III, (B) – IV, (C) – I, (D) – II
- (d) (A) – II, (B) – I, (C) – III, (D) – IV

42. The major product 'P' for the following sequence of reactions is: [Jan. 29, 2023 (I)]

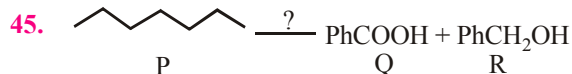


- (a)
- (b)
- (c)
- (d)

43. Find out the major products from the following reaction sequence. [Jan. 29, 2023 (II)]

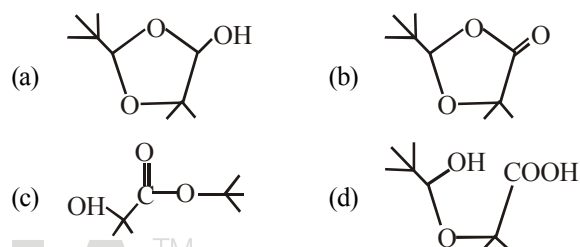
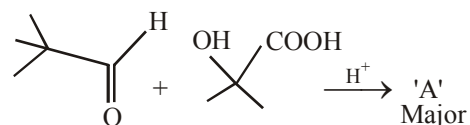


44. Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R :
Assertion A : Acetal/ketal is stable in basic medium.
Reason R : The high leaving tendency of alkoxide ion gives the stability to acetal/ketal in basic medium.
 In the light of the above statements, choose the correct answer from the options given below: [Jan. 25, 2023 (I)]
- A is true but R is false
 - A is false but R is true
 - Both A and R are true and R is the correct explanation of A
 - Both A and R are true but R is NOT the correct explanation of A

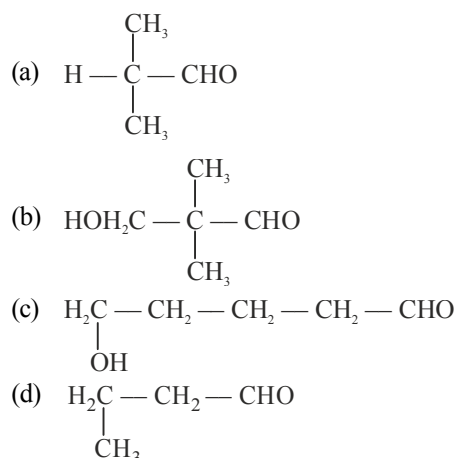
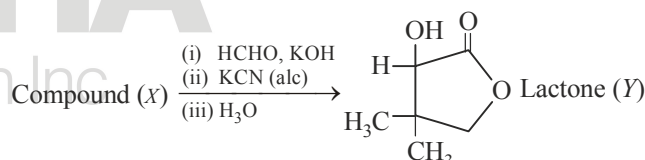


The correct sequence of reagents for the preparation of Q and R is :

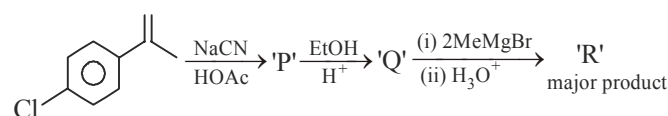
- (i) Cr_2O_3 , 770 K, 20 atm; (ii) CrO_2Cl_2 , H_3O^+ ; (iii) NaOH; (iv) H_3O^+
 - (i) CrO_2Cl_2 , H_3O^+ ; (ii) Cr_2O_3 , 770 K, 20 atm; (iii) NaOH; (iv) H_3O^+
 - (i) KMnO_4 , OH^- ; (ii) Mo_2O_3 , A; (iii) NaOH; (iv) H_3O^+
 - (i) Mo_2O_3 , Δ ; (ii) CrO_2Cl_2 , H_3O^+ ; (iii) NaOH; (iv) H_3O^+
46. 'A' in the given reaction is [Jan. 25, 2023 (II)]

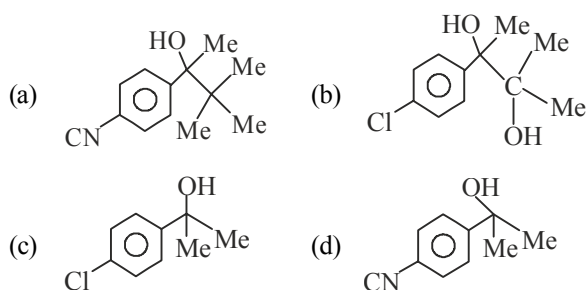


47. Compound (X) undergoes following sequence of reactions to give the lactone (Y). [Jan. 24, 2023 (I)]



48. 'R' formed in the following sequence of reaction is: [Jan. 24, 2023 (I)]





49. Given below are two statements: [Jan. 24, 2023 (II)]

Statement I: under Clemmensen reduction conditions will give

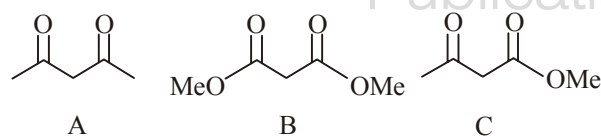
Statement II: under Wolff-Kishner reduction condition will give

Statement II: under Wolff-Kishner reduction condition will give

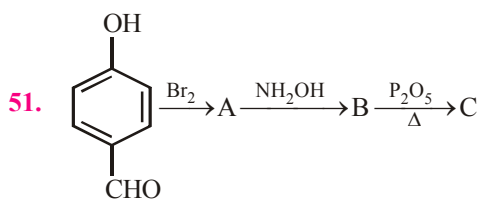
reduction condition will give

In the light of the above statements, choose the correct answer from the options given below :

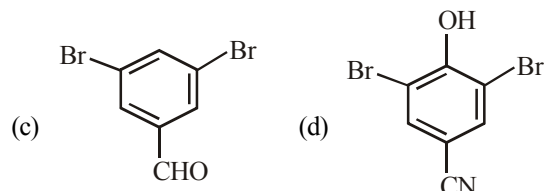
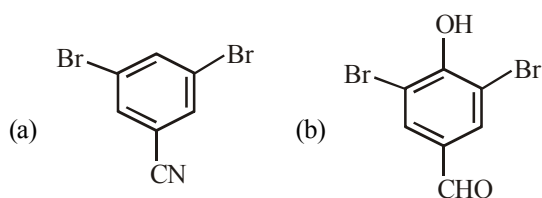
- (a) Statement I is false but Statement II is true.
 (b) Both Statement I and Statement II are false.
 (c) Statement I is true but Statement II is false.
 (d) Both Statement I and Statement II are true.
50. Which will undergo deprotonation most readily in basic medium? [Jan. 24, 2023 (II)]



- (a) A only (b) C only
 (c) Both A and C (d) B only



Consider the above reaction sequence, the product 'C' is : [July 29, 2022 (I)]

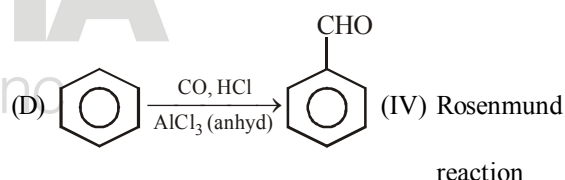
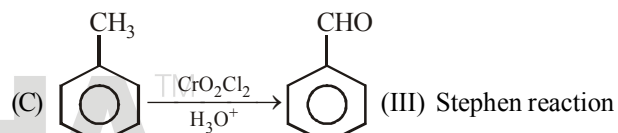
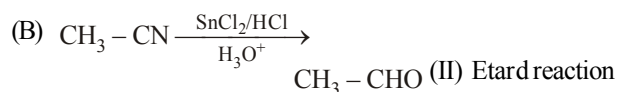
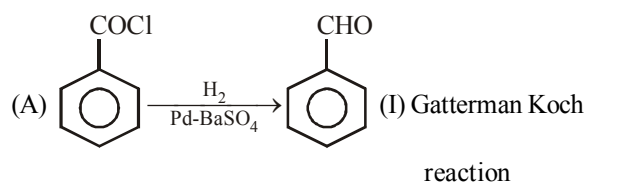


52. The number of stereoisomers formed in a reaction of (\pm) $\text{Ph}(\text{C}=\text{O})\text{C}(\text{OH})(\text{CN})\text{Ph}$ with HCN is _____. [NV, July 29, 2022 (II)]

53. Match List-I with List-II.

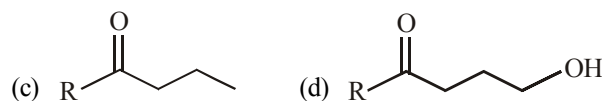
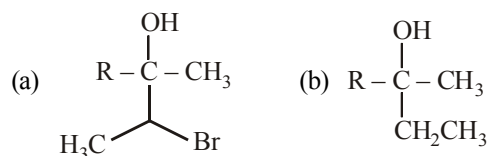
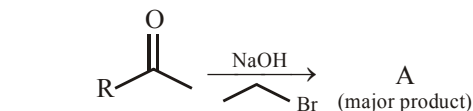
List-I

List-II

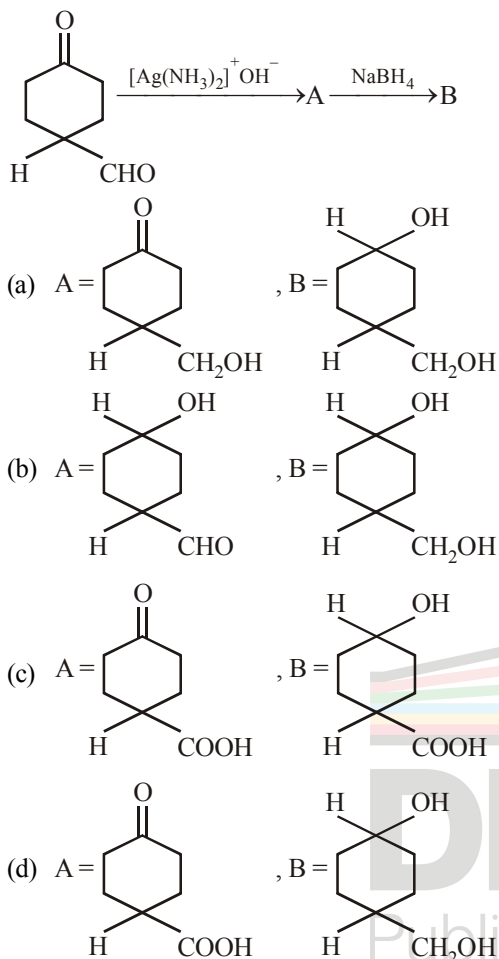


Choose the **correct** answer from the options given below: [July 27, 2022 (II)]

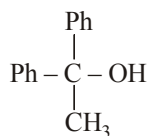
- (a) (A)-(IV), (B)-(III), (C)-(II), (D)-(I)
 (b) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)
 (c) (A)-(II), (B)-(III), (C)-(IV), (D)-(I)
 (d) (A)-(III), (B)-(II), (C)-(I), (D)-(IV)
54. The structure of A in the given reaction is: [July 27, 2022 (II)]



55. The products formed in the following reaction, **A** and **B** are
[July 26, 2022 (I)]

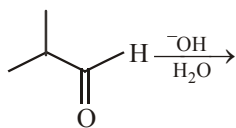


56. Which reactant will give the following alcohol on reaction with one mole of phenyl magnesium bromide (PhMgBr) followed by acidic hydrolysis?
[July 26, 2022 (I)]

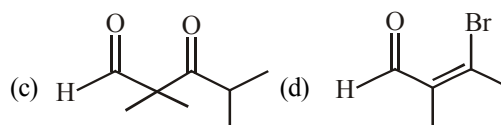


- (a) CH3-C#N (b) Ph-C#N
- (c) CH3-C(=O)-O-Ph (d) Ph-C(=O)-CH3

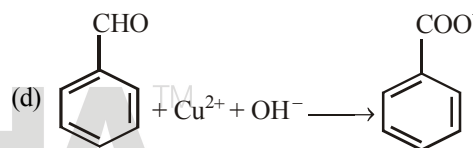
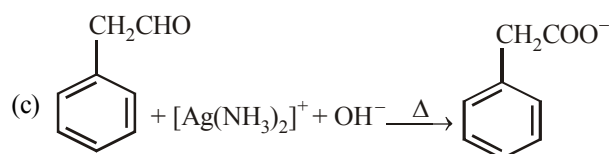
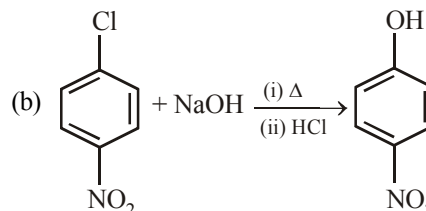
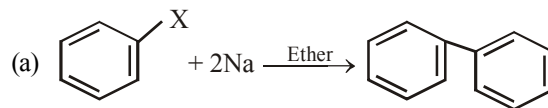
57. What is the major product of the following reaction?
[July 25, 2022 (II)]



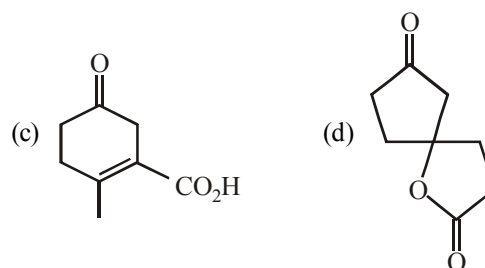
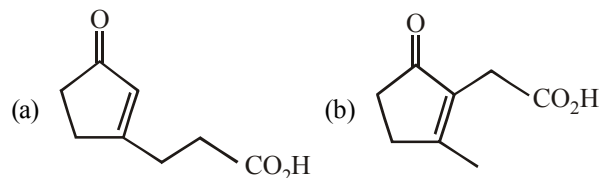
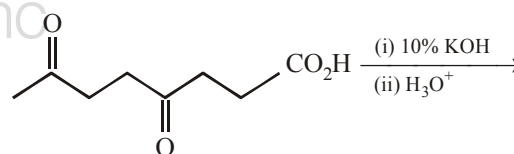
- (a) CC(C)C(=O)C=C(C)C (b) CC(C)C(=O)C(O)C(C)C



58. Choose the reaction which is **not** possible:
[June 30, 2022 (I)]

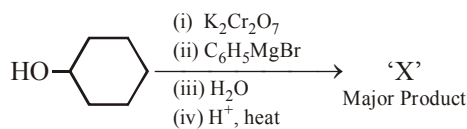


59. Which among the following will be the major product of the given reaction?
[June 30, 2022 (I)]



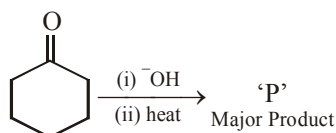
60. $C_6H_{12}O_6 \xrightarrow{\text{Zymase}} A \xrightarrow[\Delta]{NaOI} B + CHI_3$
The number of carbon atoms present in the product B is _____.
[NV, June 29, 2022 (I)]

61. In the given reaction



the number of sp^2 hybridised carbon(s) in compound 'X' is _____.
[NV, June 29, 2022 (II)]

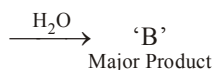
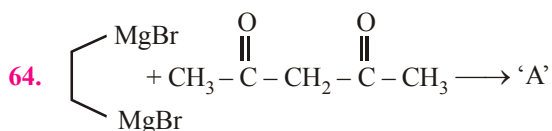
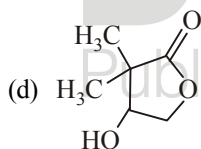
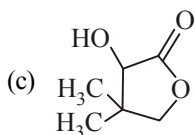
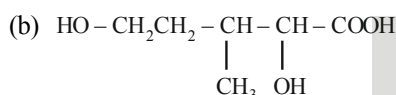
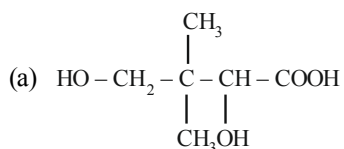
62. In the given reaction



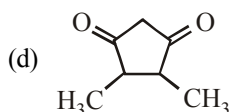
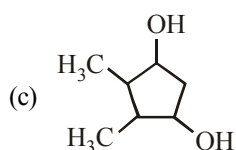
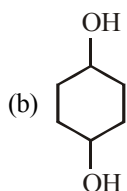
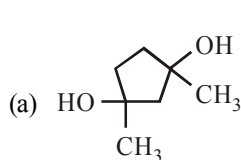
The number of π electrons present in the product 'P' is _____.
[NV, June 29, 2022 (II)]

63. Isobutyraldehyde on reaction with formaldehyde and K_2CO_3 gives compound 'A'. Compound 'A' reacts with KCN and yields compound 'B', which on hydrolysis gives a stable compound 'C'. The compound 'C' is:

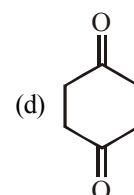
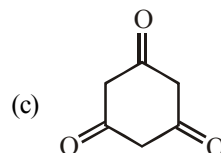
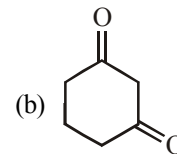
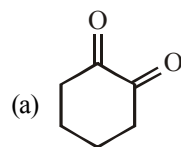
[June 28, 2022 (II)]



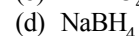
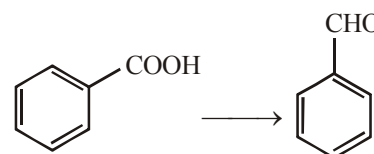
Consider the above reaction sequence and identify the product B.
[June 26, 2022 (I)]



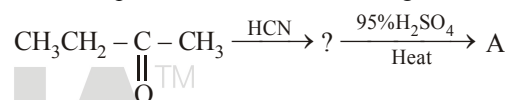
65. Which will have the highest enol content? [June 26, 2022 (I)]



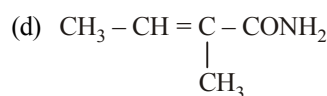
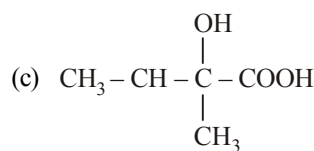
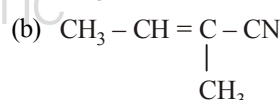
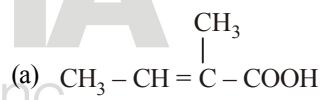
66. The reagent, from the following, which converts benzoic acid to benzaldehyde in one step is [June 26, 2022 (II)]



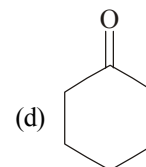
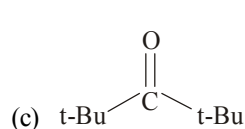
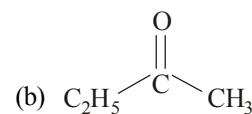
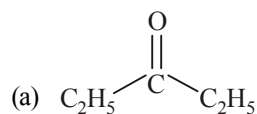
67. The final product 'A' in the following reaction sequence



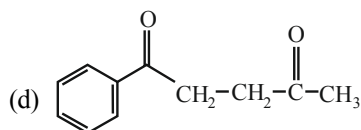
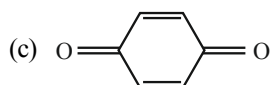
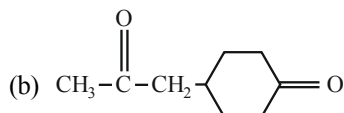
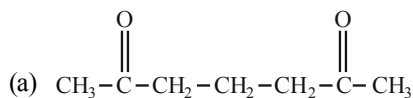
[June 26, 2022 (II)]



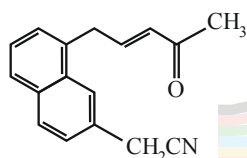
68. Which of the following ketone will NOT give enamine on treatment with secondary amines?
[where t-Bu is $-\text{C}(\text{CH}_3)_3$]
[June 25, 2022 (II)]



69. Which of the following is an example of conjugated diketone?
[June 24, 2022 (I)]



70. Number of electrophilic centre in the given compound is _____
[NV, June 24, 2022 (I)]



71. Hex-4-ene-2-ol on treatment with PCC gives 'A'. 'A' on reaction with sodium hypoiodite gives 'B', which on further heating with soda lime gives 'C'. The compound 'C' is
[June 24, 2022 (II)]

- (a) 2-pentene (b) propanaldehyde
(c) 2-butene (d) 4-methylpent-2-ene

72. Given below are two statements :

Statement I : The nucleophilic addition of sodium hydrogen sulphite to an aldehyde or a ketone involves proton transfer to form a stable ion.

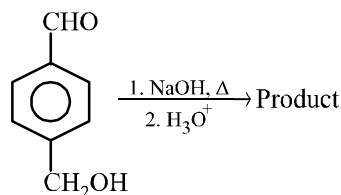
Statement II : The nucleophilic addition of hydrogen cyanide to an aldehyde or a ketone yields amine as final product.

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

[Sep. 1, 2021 (II)]

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

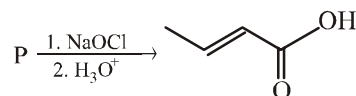
73. For the reaction given below : [Aug. 31, 2021 (II)]



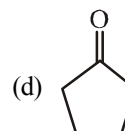
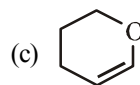
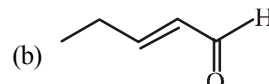
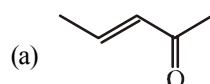
The compound which is **not** formed as a product in the reaction is a :

- (a) compound with both alcohol and acid functional groups
(b) monocarboxylic acid
(c) dicarboxylic acid
(d) diol

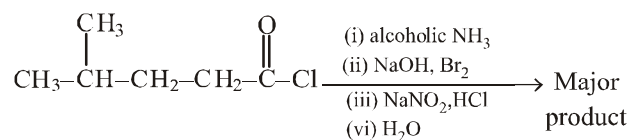
74. The structure of the starting compound P used in the reaction given below is :



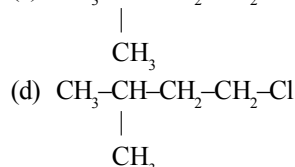
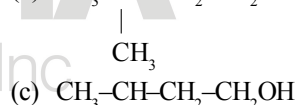
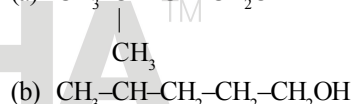
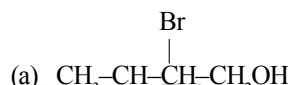
[Aug. 27, 2021 (I)]



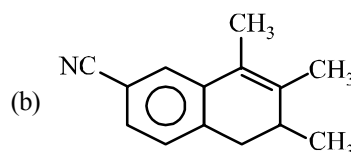
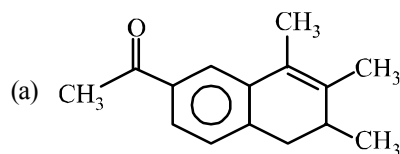
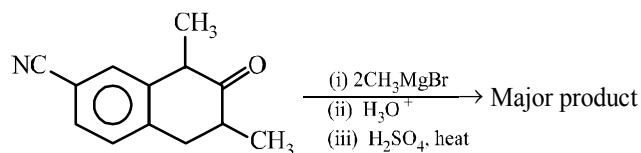
75. The major product of the following reaction is:

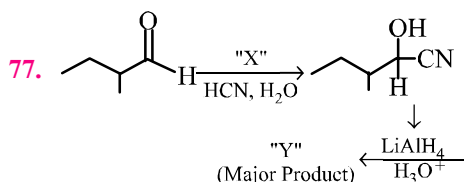
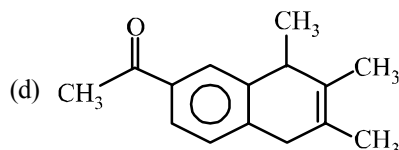
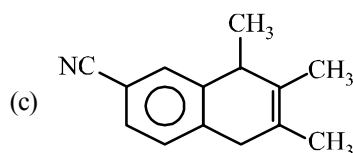


[Aug. 27, 2021 (I)]



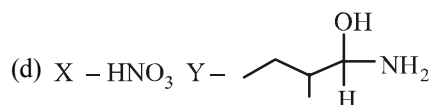
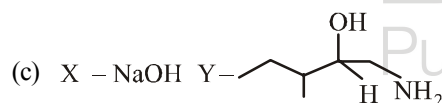
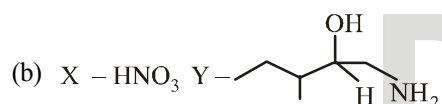
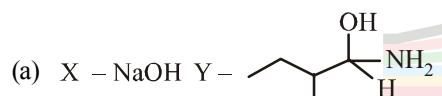
76. Which one of the following is the major product of the given reaction?
[Aug. 27, 2021 (II)]



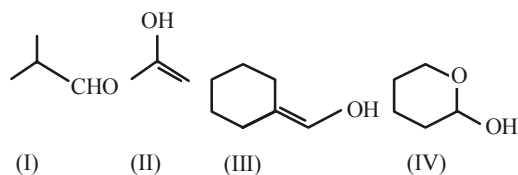


Consider the given reaction, Identify 'X' and 'Y' :

[Aug. 26, 2021 (II)]



78.



Which among the above compound/s does/do not form silver mirror when treated with Tollen's reagent?

[July 20, 2021 (I)]

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

79. The number of nitrogen atoms in a semicarbazone molecule of acetone is _____. [NV, July 20, 2021 (I)]

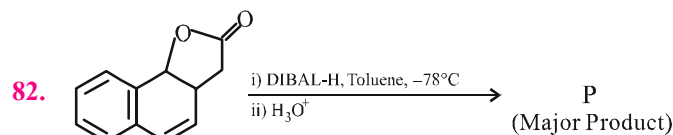
80. In Tollen's test for aldehyde, the overall number of electrons(s) transferred to the Tollen's reagent formula

[Ag(NH₃)₂]⁺ per aldehyde group to form silver mirror is _____. (Round off to the nearest integer).

[NV, March 18, 2021 (II)]

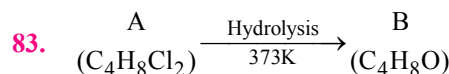
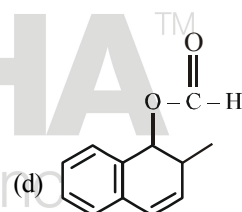
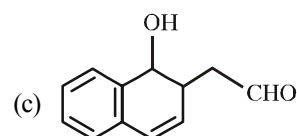
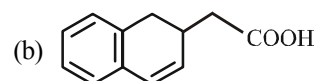
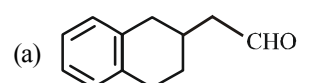
81. The total number of C – C sigma bond/s in mesityl oxide (C₆H₁₀O) is _____. (Round off to the nearest integer).

[NV, March 17, 2021 (II)]



The product "P" in the above reaction is :

[March 16, 2021 (I)]



B reacts with hydroxyl amine but does not give Tollen's test. Identify A and B.

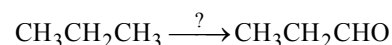
[Feb. 26, 2021 (I)]

- (a) 2, 2-Dichlorobutane and Butanal
(b) 1, 1-Dichlorobutane and Butanal
(c) 1, 1-Dichlorobutane and 2-Butanone
(d) 2, 2-Dichlorobutane and Butan-2-one

84. 2,4-DNP test can be used to identify [Feb. 26, 2021 (II)]

- (a) Aldehyde (b) Amine
(c) Ether (d) Halogens

85. Which of the following reagent is used for the following reaction? [February 24, 2021 (I)]



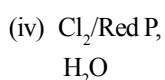
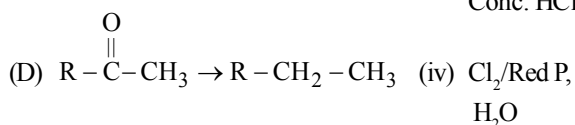
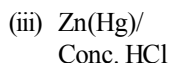
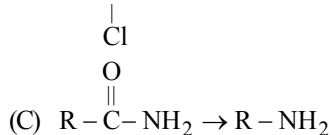
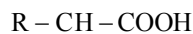
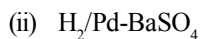
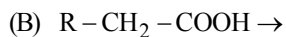
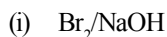
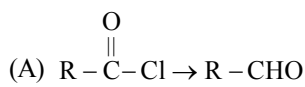
- (a) Manganese acetate
(b) Copper at high temperature and pressure
(c) Molybdenum oxide
(d) Potassium permanganate

86. Match list-I and list-II.

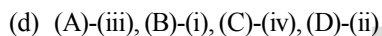
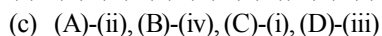
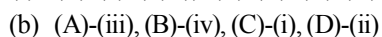
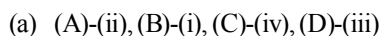
[February 24, 2021 (II)]

List-I

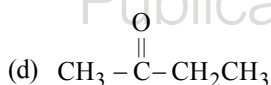
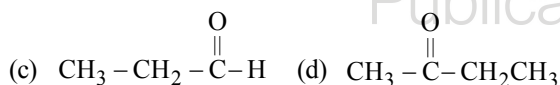
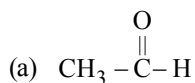
List-II



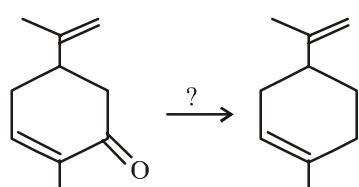
Choose the correct answer from the options given below:



87. Which one of the following carbonyl compounds cannot be prepared by addition of water on an alkyne in the presence of HgSO_4 and H_2SO_4 ? [February 24, 2021 (II)]

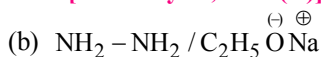
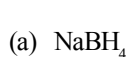


88.

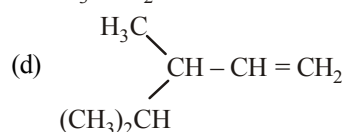
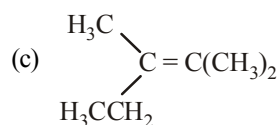
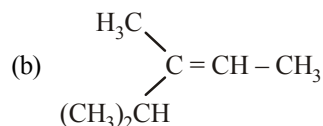
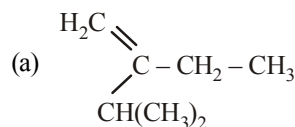
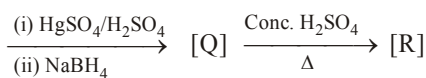
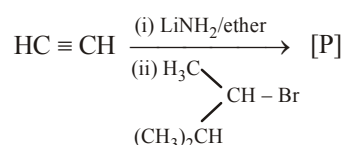


Which of the following reagent is suitable for the preparation of the product in the above reaction?

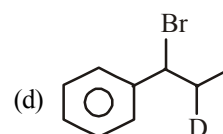
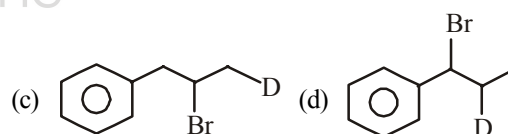
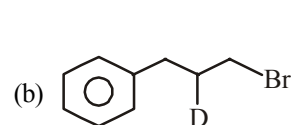
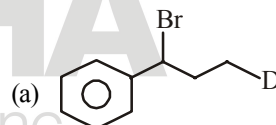
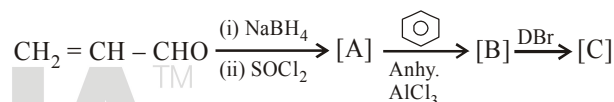
[February 24, 2021 (II)]



89. The major product [R] in the following sequence of reactions is : [Sep. 04, 2020 (II)]

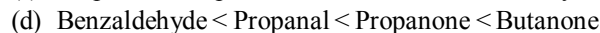
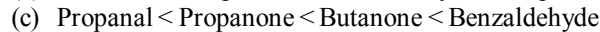
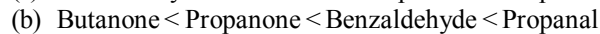


90. The major product [C] of the following reaction sequence will be : [Sep. 04, 2020 (II)]



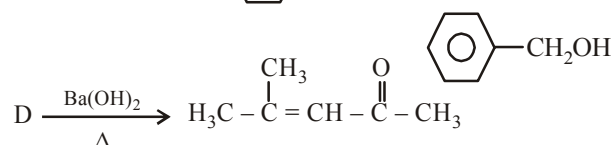
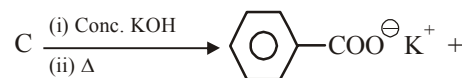
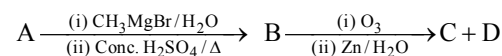
91. The increasing order of the reactivity of the following compounds in nucleophilic addition reaction is : Propanal, Benzaldehyde, Propanone, Butanone

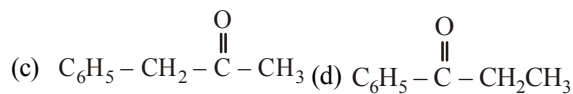
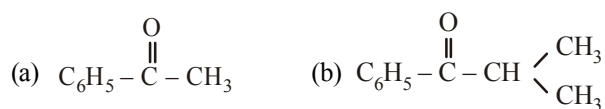
[Sep. 03, 2020 (II), Online May 7, 2012 (s)]



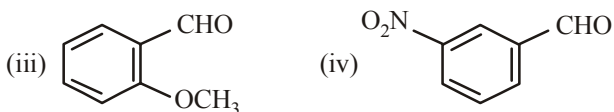
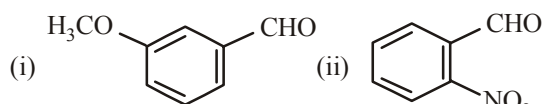
92. The compound A in the following reactions is :

[Sep. 03, 2020 (II)]





93. The increasing order of the following compounds towards HCN addition is : [Sep. 02, 2020 (I)]

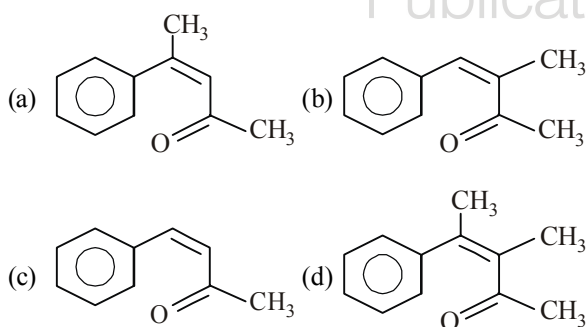
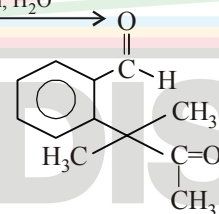


- (a) (i) < (iii) < (iv) < (ii) (b) (iii) < (iv) < (i) < (ii)
(c) (iii) < (i) < (iv) < (ii) (d) (iii) < (iv) < (ii) < (i)

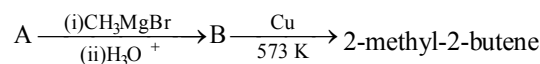
94. Identify (A) in the following reaction sequence:

[Jan. 09, 2020 (I)]

(A) $\xrightarrow[\text{(ii) } \text{H}^+, \text{H}_2\text{O}]{\text{(i) } \text{CH}_3\text{MgBr}}$ (B) $\xrightarrow[\text{(ii) Conc. } \text{H}_2\text{SO}_4/\Delta]{\text{(i) } \text{O}_3/\text{Zn}, \text{H}_2\text{O}}$
Gives positive iodoform test



95. Consider the following reactions

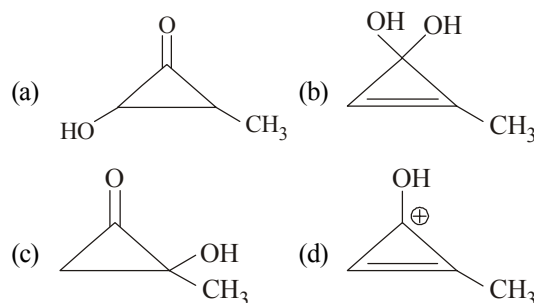
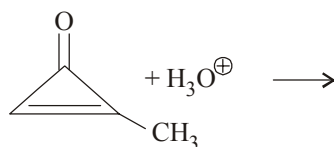


The mass percentage of carbon in A is _____.

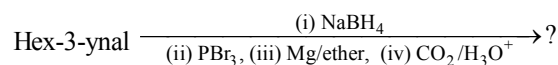
[NV, Jan. 09, 2020 (II)]

96. The major product in the following reaction is:

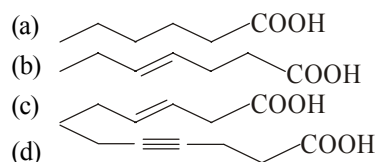
[Jan. 08, 2020 (II)]



97. What is the product of following reaction?

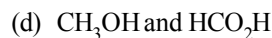
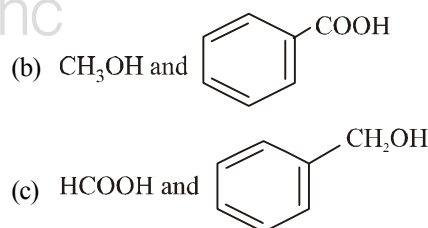
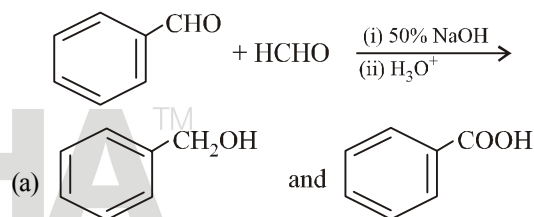


[Jan. 07, 2020 (I)]

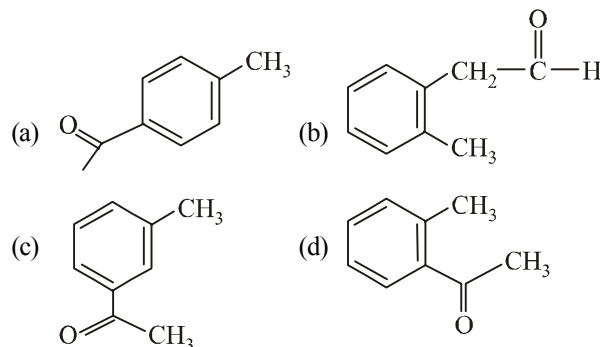


98. Major products of the following reaction are :

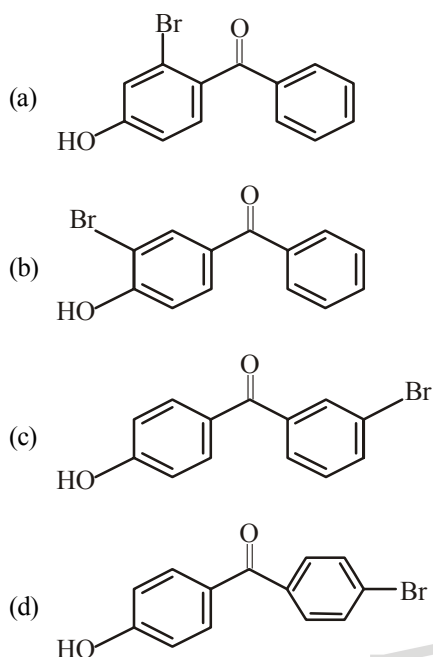
[April 10, 2019 (I)]



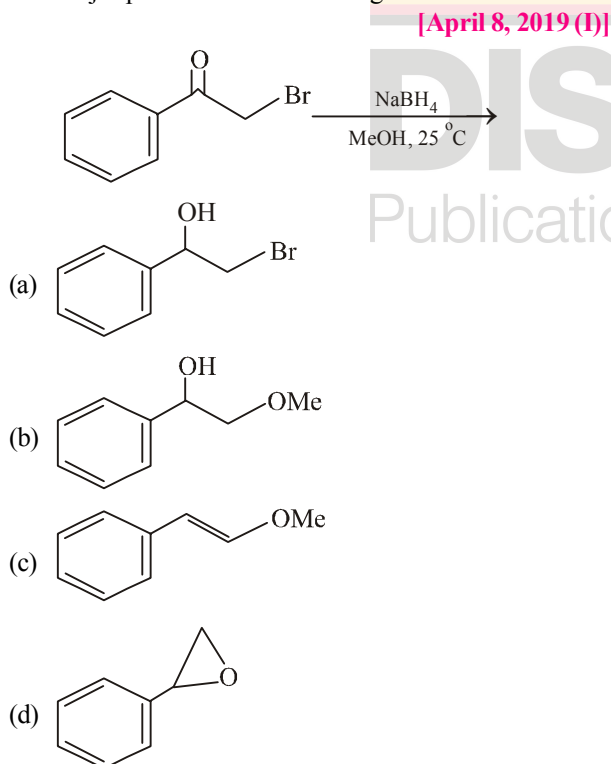
99. Compound A ($\text{C}_9\text{H}_{10}\text{O}$) shows positive iodoform test. Oxidation of A with KMnO_4/KOH gives acid B ($\text{C}_8\text{H}_6\text{O}_4$). Anhydride of B is used for the preparation of phenolphthalein. Compound A is : [April 10, 2019 (II)]



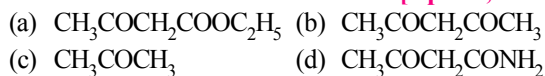
100. *p*-Hydroxybenzophenone upon reaction with bromine in carbon tetrachloride gives: [April 9, 2019 (II)]



101. The major product of the following reaction is:

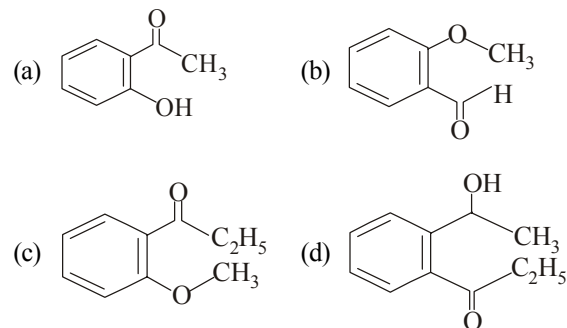


102. Which of the following compounds will show the maximum 'enol' content? [April 8, 2019 (II)]

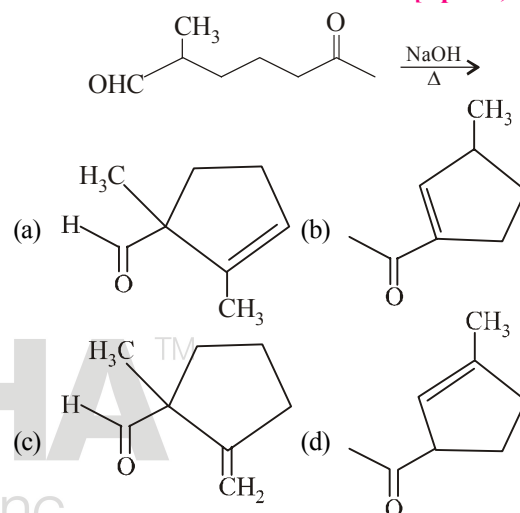


103. An organic compound neither reacts with neutral ferric chloride solution nor with Fehling solution. It however,

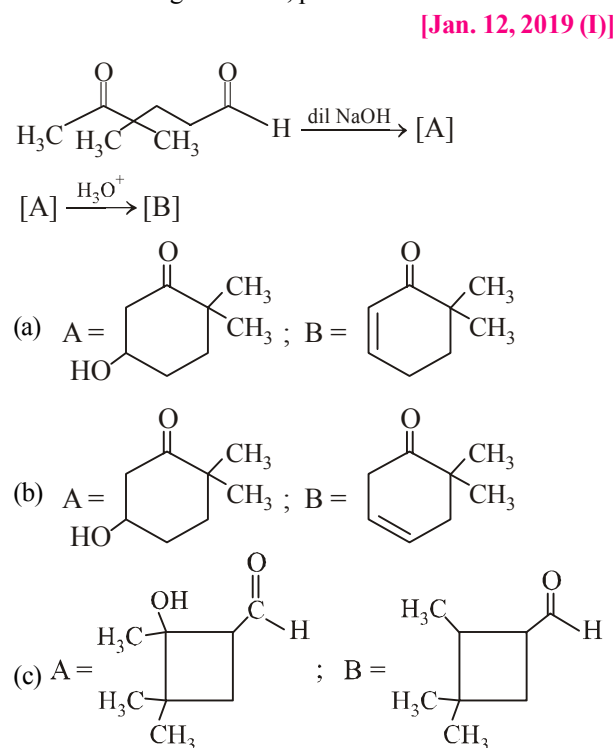
reacts with Grignard reagent and gives positive iodoform test. The compound is: [April 8, 2019 (I)]

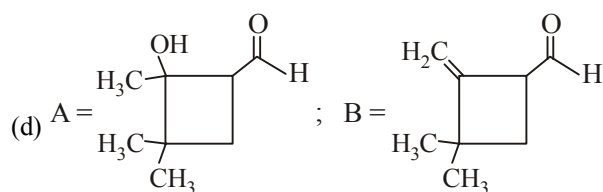


104. The major product obtained in the following reaction is: [April 8, 2019 (II)]



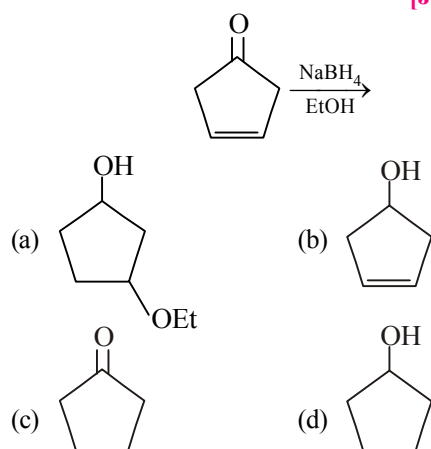
105. In the following reactions, products A and B are:



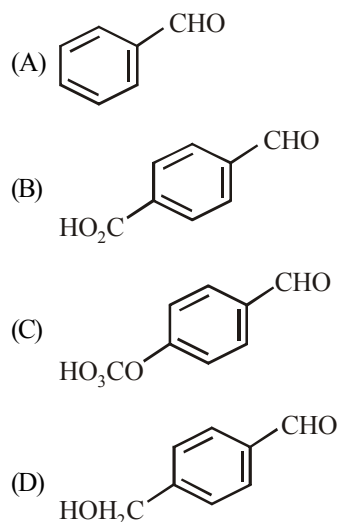


106. The major product of the following reaction is :

[Jan. 12, 2019 (II)]



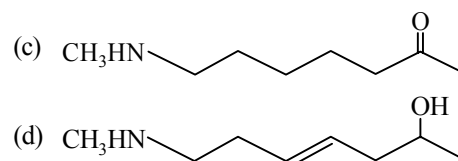
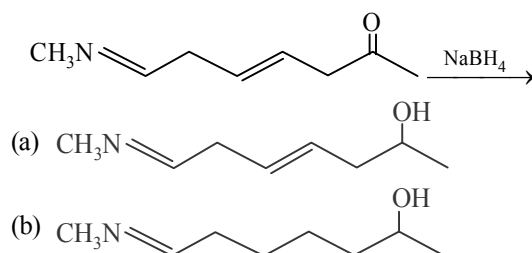
107. The aldehydes which will **not** form Grignard product with one equivalent of Grignard reagents are: [Jan. 12, 2019 (II)]



- (a) (B), (D) (b) (B), (C)
(c) (B), (C), (D) (d) (C), (D)

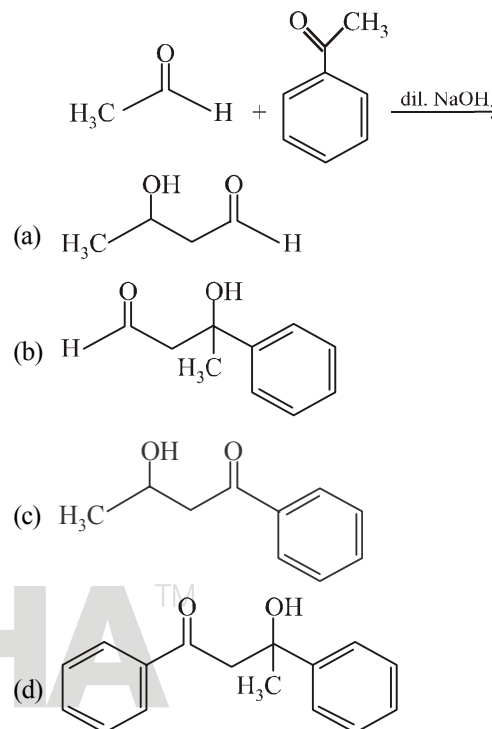
108. The major product of the following reaction is:

[Jan. 10, 2019 (II)]

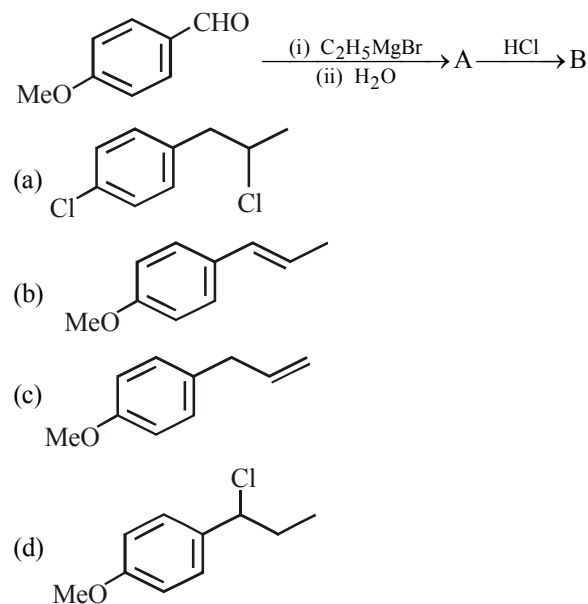


109. The major product formed in the following reaction is:

[Jan. 9, 2019 (II)]



110. The major product B formed in the following reaction sequence is: [Online April 16, 2018]

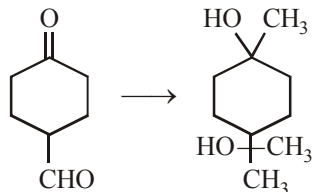


111. Which of the following compound will most readily be dehydrated to give alkene under acidic condition?

[Online April 16, 2018]

- (a) 4-Hydroxypentan-2-one
- (b) 3-Hydroxypentan-2-one
- (c) 1-Pentanol
- (d) 2-Hydroxycyclopentanone

112. The correct sequence of reagents for the following conversion will be : [2017]



- (a) $[\text{Ag}(\text{NH}_3)_2]^+ \text{OH}^-$, $\text{H}^+/\text{CH}_3\text{OH}$, CH_3MgBr
 - (b) CH_3MgBr , $\text{H}^+/\text{CH}_3\text{OH}$, $[\text{Ag}(\text{NH}_3)_2]^+ \text{OH}^-$
 - (c) CH_3MgBr , $[\text{Ag}(\text{NH}_3)_2]^+ \text{OH}^-$, $\text{H}^+/\text{CH}_3\text{OH}$
 - (d) $[\text{Ag}(\text{NH}_3)_2]^+ \text{OH}^-$, CH_3MgBr , $\text{H}^+/\text{CH}_3\text{OH}$
113. 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: [Online April 9, 2017]

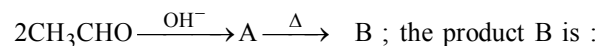
- (a)
- (b)
- (c)
- (d)

114. The correct statement about the synthesis of pentaerythritol ($\text{C}(\text{CH}_2\text{OH})_4$) used in the preparation of PETN is : [Online April 10, 2016]

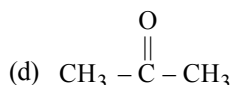
- (a) The synthesis requires three aldol condensations and one Cannizzaro reaction.
- (b) Alpha hydrogens of ethanol and methanol are involved in this reaction.

- (c) The synthesis requires two aldol condensations and two Cannizzaro reactions.
- (d) The synthesis requires four aldol condensations between methanol and ethanol.

115. In the reaction sequence [Online April 11, 2015]



- (a) $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{OH}$
- (b) $\text{CH}_3-\text{CH}=\text{CH}-\text{CHO}$
- (c) $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}_3$



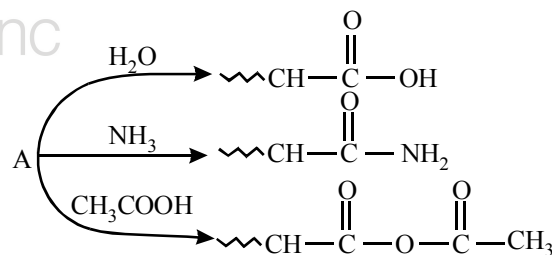
116. Which one of the following reactions will not result in the formation of carbon-carbon bond? [Online April 9, 2014]

- (a) Reimer-Tiemann reaction
- (b) Friedel Craft's acylation
- (c) Wurtz reaction
- (d) Cannizzaro reaction

117. Which is major product formed when acetone is heated with iodine and potassium hydroxide? [Online April 9, 2014]

- (a) Iodoacetone
- (b) Acetic acid
- (c) Iodoform
- (d) Acetophenone

118. An organic compound A, $\text{C}_5\text{H}_8\text{O}$; reacts with H_2O , NH_3 and CH_3COOH as described below: [Online April 11, 2014]



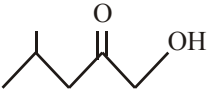
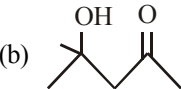

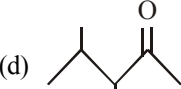
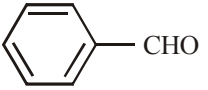

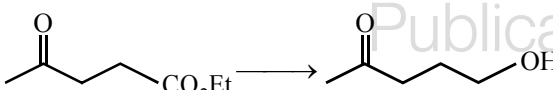
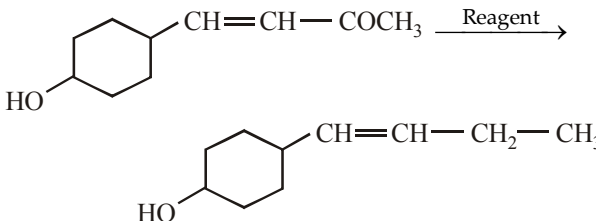
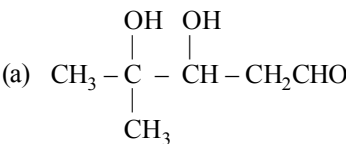
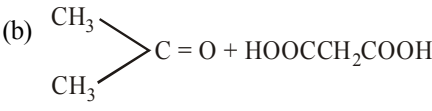
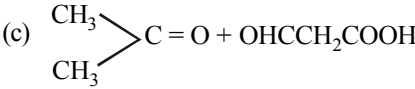
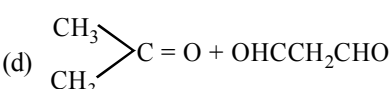
A is:

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

119. Tischenko reaction is a modification of:

- (a) Aldol condensation
- (b) Claisen condensation

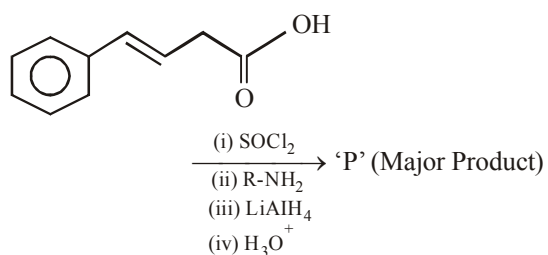
[Online April 11, 2014]

- (c) Cannizzaro reaction
(d) Pinacol-pinacolone reaction
120. Formaldehyde can be distinguished from acetaldehyde by the use of : **[Online April 9, 2013]**
(a) Schiff's reagent (b) Tollen's reagent
(c) I_2 /Alkali (d) Fehling's solution
121. Clemmensen reduction of a ketone is carried out in the presence of : **[Online April 22, 2013]**
(a) $LiAlH_4$ (b) Zn-Hg with HCl
(c) Glycol with KOH (d) H_2 with Pt as catalyst
122. Which of the following is the product of aldol condensation? **[Online April 23, 2013]**
- (a)  (b) 
(c)  (d) 
123. Cannizzaro's reaction is not given by : **[Online April 25, 2013]**
- (a)  (b) 
(c) CH_3CHO (d) $HCHO$
124. Which of the following reagent(s) is/are used for the conversion?
 **[Online April 25, 2013]**
(a) glycol/ $LiAlH_4/H_3O^+$ (b) glycol/ NaH/H_3O^+
(c) $LiAlH_4$ (d) $NaBH_4$
125. Iodoform can be prepared from all except : **[2012]**
(a) Ethyl methyl ketone (b) Isopropyl alcohol
(c) 3-Methyl 2-butanone (d) Isobutyl alcohol
126. In the given transformation, which of the following is the most appropriate reagent ? **[2012]**
- 
- (a) $NH_2NH_2, \bar{O}H$ (b) Zn - Hg/ HCl
(c) Na, Liq. NH_3 (d) $NaBH_4$
127. Tollen's reagent and Fehling solutions are used to distinguish between **[Online May 26, 2012]**
(a) acids and alcohols
(b) alkanes and alcohols
(c) ketones and aldehydes
(d) *n*-alkanes and branched alkanes
128. In Cannizzaro reaction given below
 $2PhCHO \xrightarrow{:\bar{O}H^-} PhCH_2OH + PhCO_2^-$
the slowest step is : **[2009]**
(a) the transfer of hydride to the carbonyl group
(b) the abstraction of proton from the carboxylic group
(c) the deprotonation of $PhCH_2OH$
(d) the attack of $:\bar{O}H^-$ at the carboxyl group
129. The increasing order of the rate of HCN addition to compound A to D is **[2006]**
(A) $HCHO$ (B) CH_3COCH_3
(C) $PhCOCH_3$ (D) $PhCOPh$
(a) $D < C < B < A$ (b) $C < D < B < A$
(c) $A < B < C < D$ (d) $D < B < C < A$
130. Reaction of cyclohexanone with dimethylamine in the presence of catalytic amount of an acid forms a compound if water during the reaction is continuously removed. The compound formed is generally known as **[2005]**
(a) an amine (b) an imine
(c) an enamine (d) a Schiff's base
131. On mixing ethyl acetate with aqueous sodium chloride, the composition of the resultant solution is **[2004]**
(a) $CH_3COCl + C_2H_5OH + NaOH$
(b) $CH_3COONa + C_2H_5OH$
(c) $CH_3COOC_2H_5 + NaCl$
(d) $CH_3Cl + C_2H_5COONa$
132. Acetyl bromide reacts with excess of CH_3MgI followed by treatment with a saturated solution of NH_4Cl gives **[2004]**
(a) 2-methyl-2-propanol (b) acetamide
(c) acetone (d) acetyl iodide
133. On vigorous oxidation by permanganate solution. **[2002]**
 $(CH_3)_2C=CH-CH_2-CHO$ gives
(a) 
(b)  + $HOOCCH_2COOH$
(c)  + $OHCCH_2COOH$
(d)  + $OHCCH_2CHO$

Topic 3

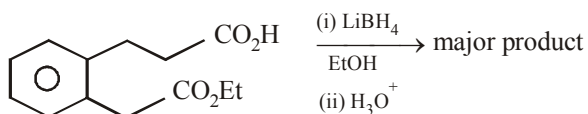
Preparation and Properties of Carboxylic Acids and their Derivatives

134. The major product 'P' formed in the following sequence of reactions is [April 12, 2023 (I)]



- (a)
- (b)
- (c)
- (d)

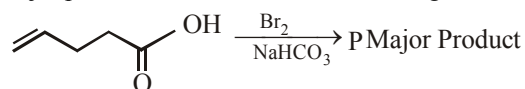
135. The major product formed in the following reaction is:



[April 08, 2023 (I)]

- (a)
- (b)
- (c)
- (d)

136. Major product 'P' formed in the following reaction is :-



[April 08, 2023 (II)]

- (a)
- (b)
- (c)
- (d)

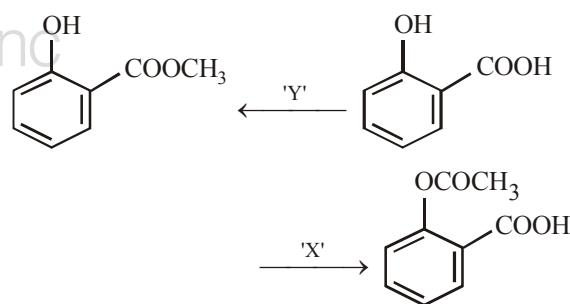
137. The descending order of acidity for the following carboxylic acid is : [April 08, 2023 (II)]

- A. CH_3COOH
 B. $\text{F}_3\text{C-COOH}$
 C. $\text{ClCH}_2\text{-COOH}$
 D. $\text{FCH}_2\text{-COOH}$
 E. $\text{BrCH}_2\text{-COOH}$

Choose the correct answer from the options given below:

- (a) $\text{D} > \text{B} > \text{A} > \text{E} > \text{C}$
 (b) $\text{E} > \text{D} > \text{B} > \text{A} > \text{C}$
 (c) $\text{B} > \text{C} > \text{D} > \text{E} > \text{A}$
 (d) $\text{B} > \text{D} > \text{C} > \text{E} > \text{A}$

138. In a reaction, [Feb. 01, 2023 (II)]

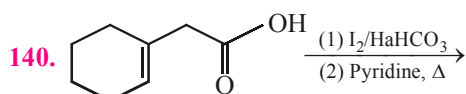


reagents 'X' and 'Y' respectively are :

- (a) $\text{CH}_3\text{OH}/\text{H}^+$, Δ and $(\text{CH}_3\text{CO})_2\text{O}/\text{H}^+$
 (b) $(\text{CH}_3\text{CO})_2\text{O}/\text{H}^+$ and $\text{CH}_3\text{OH}/\text{H}^+$, Δ
 (c) $\text{CH}_3\text{OH}/\text{H}^+$, Δ and $\text{CH}_3\text{OH}/\text{H}^+$, Δ
 (d) $(\text{CH}_3\text{CO})_2\text{O}/\text{H}^+$ and $(\text{CH}_3\text{CO})_2\text{O}/\text{H}^+$

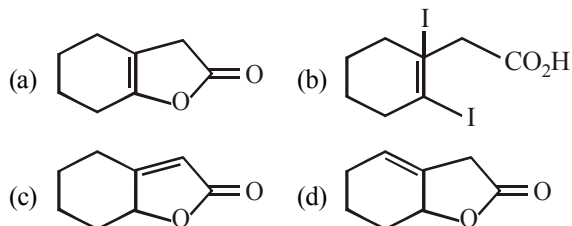
139. Among the following marked proton of which compound shows lowest pK_a value? [July 28, 2022 (I)]

- (a)
 (b)
 (c)
 (d)

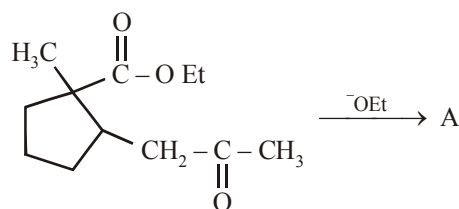


Find out the major product for the above reaction.

[July 28, 2022 (II)]



141. In the given reaction

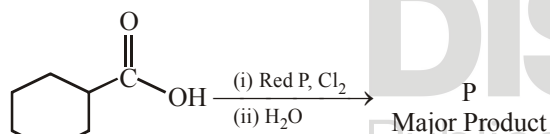


(Where Et is $-\text{C}_2\text{H}_5$)

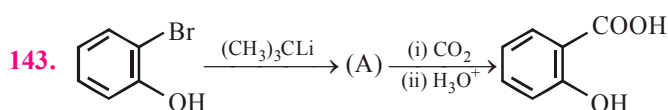
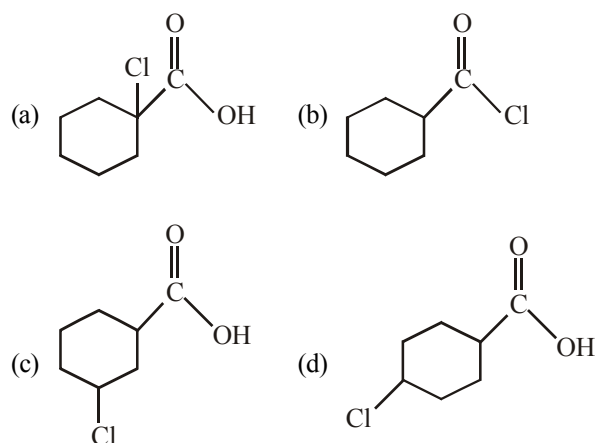
The number of chiral carbon/s in product A is _____.

[NV, July 25, 2022 (I)]

142. Consider the given chemical reaction. [June 30, 2022 (I)]

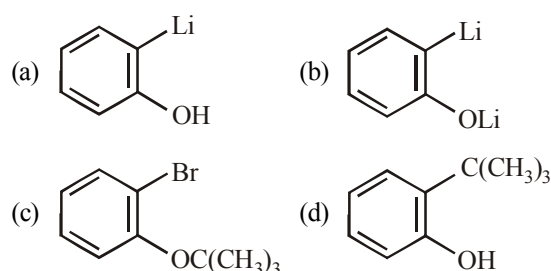


Identify the product P.



In the given conversion the compound A is :

[June 29, 2022 (I)]



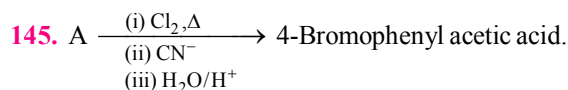
144. Given below are two statements : [June 29, 2022 (I)]

Statement I : The esterification of carboxylic acid with an alcohol is a nucleophilic acyl substitution.

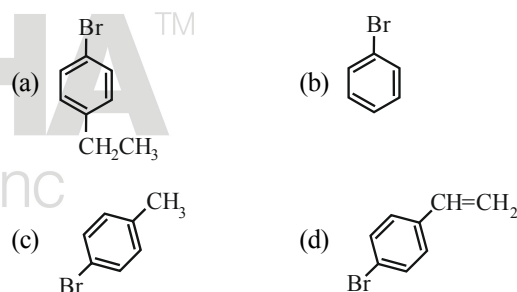
Statement II : Electron withdrawing groups in the carboxylic acid will increase the rate of esterification reaction.

Choose the **most appropriate** option :

- (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 I is incorrect but Statement II is correct.



In the above reaction 'A' is [June 28, 2022 (II)]



146. Decarboxylation of all six possible forms of diaminobenzoic acids $\text{C}_6\text{H}_3(\text{NH}_2)_2\text{COOH}$ yields three products A, B and C. Three acids give a product 'A', two acids give a product 'B' and one acid gives a product 'C'. The melting point of product 'C' is [June 27, 2022 (II)]

- (a) 63°C (b) 90°C
 (c) 104°C (d) 142°C

147. Two statements are given below :

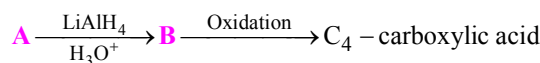
Statement I : The melting point of monocarboxylic acid with even number of carbon atoms is higher than that of with odd number of carbon atoms acid immediately below and above it in the series.

Statement II : The solubility of monocarboxylic acids in water decreases with increase in molar mass.

Choose the **most appropriate** option: [June 24, 2022 (I)]

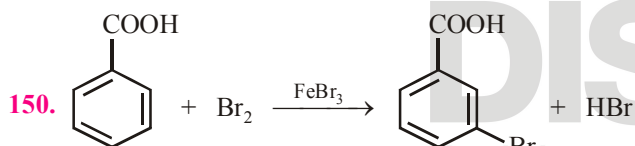
- (a) Both Statement I and Statement II are correct.
 (b) Both Statement I and Statement II are incorrect.
 (c) Statement I is correct but Statement II is incorrect.
 (d) Statement I is incorrect but Statement II is correct.

148. In the following sequence of reactions a compound **A**, (molecular formula $C_6H_{12}O_2$) with a straight chain structure gives a C_4 carboxylic acid. **A** is :



[Sep. 1, 2021 (II)]

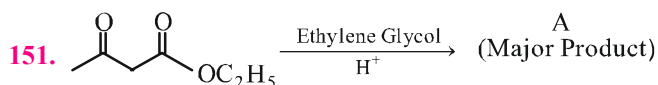
- (a) $CH_3 - CH_2 - COO - CH_2 - CH_2 - CH_3$
- (b) $CH_3 - CH_2 - \underset{\substack{| \\ OH}}{CH} - CH_2 - O - CH = CH_2$
- (c) $CH_3 - CH_2 - CH_2 - COO - CH_2 - CH_3$
- (d) $CH_3 - CH_2 - CH_2 - O - CH = CH - CH_2 - OH$
149. Given below are two statements : [Aug. 27, 2021 (II)]
- Statement I :** Ethyl pent-4-yn-oate on reaction with CH_3MgBr gives a 3° -alcohol.
- Statement II :** In this reaction one mole of ethyl pent-4-yn-oate utilizes two moles of CH_3MgBr .
- 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 false.
- (b) Statement I is false but Statement II is true.
- (c) Statement I is true but Statement II is false.
- (d) Both Statement I and Statement II are true.



Consider the above reaction where 6.1 g of benzoic acid is used to get 7.8 g of *m*-bromobenzoic acid.

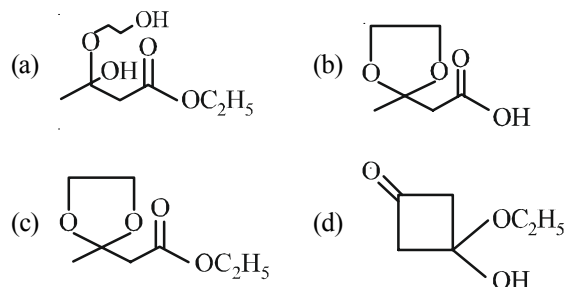
The percentage yield of the product is _____.
(Round off to nearest integer).

[Given : Atomic masses : C : 120 u, H : 1.0 u, O : 16.0 u, Br : 80.0 u] [March 18, 2021 (II)]



The product "A" in the above reaction is

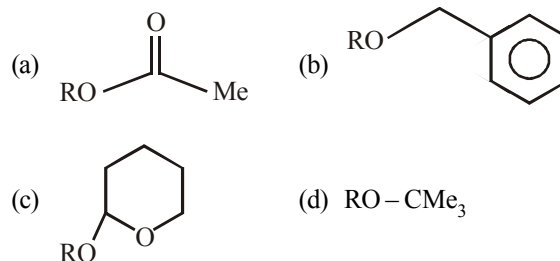
[March 17, 2021 (I)]



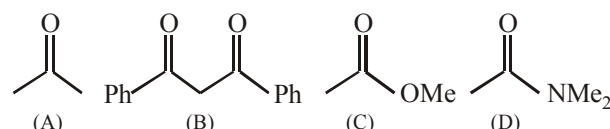
152. The number of compound/s given below which contain/s — $COOH$ group is _____. (Integer answer) [Feb. 25, 2021 (II)]

- (a) Sulphanilic acid (b) Picric acid
(c) Aspirin (d) Ascorbic Acid

153. Which of the following derivatives of alcohols is unstable in an aqueous base? [Sep. 05, 2020 (I)]

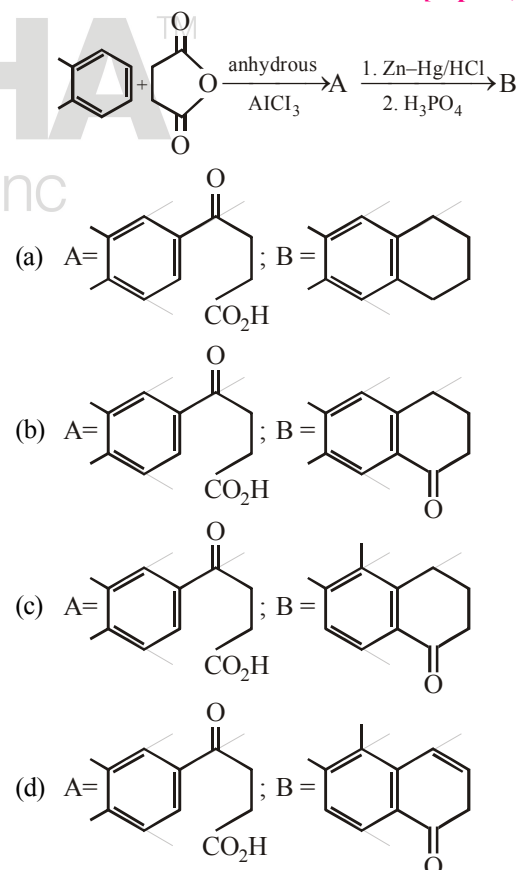


154. The increasing order of the acidity of the α -hydrogen of the following compounds is : [Sep. 05, 2020 (I)]



- (a) (D) < (C) < (A) < (B) (b) (B) < (C) < (A) < (D)
(c) (A) < (C) < (D) < (B) (d) (C) < (A) < (B) < (D)

155. In the following reaction sequence the major products A and B are : [Sep. 05, 2020 (I)]



156. An organic compound (A) (molecular formula $C_6H_{12}O_2$) was hydrolysed with dil. H_2SO_4 to give a carboxylic acid

(B) and an alcohol (C). 'C' gives white turbidity immediately when treated with anhydrous ZnCl_2 and conc. HCl . The organic compound (A) is : [Sep. 04, 2020 (I)]

- (a)
- (b)
- (c)
- (d)

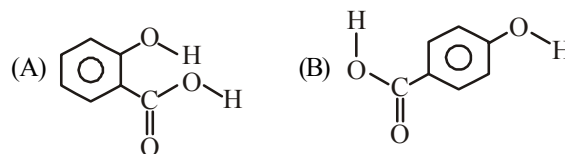
157. [P] on treatment with $\text{Br}_2/\text{FeBr}_3$ in CCl_4 produced a single isomer $\text{C}_8\text{H}_7\text{O}_2\text{Br}$ while heating [P] with soda-lime gave toluene. The compound [P] is : [Sep. 04, 2020 (I)]

- (a)
- (b)
- (c)
- (d)

158. An organic compound [A], molecular formula $\text{C}_{10}\text{H}_{20}\text{O}_2$ was hydrolyzed with dilute sulphuric acid to give a carboxylic acid [B] and an alcohol [C]. Oxidation of [C] with $\text{CrO}_3 - \text{H}_2\text{SO}_4$ produced [B]. Which of the following structures are not possible for [A]? [Sep. 03, 2020 (I)]

- (a) $\text{CH}_3 - \text{CH}_2 - \underset{\text{CH}_3}{\text{CH}} - \text{OCOCH}_2\underset{\text{CH}_3}{\text{CH}} - \text{CH}_2\text{CH}_3$
- (b) $\text{CH}_3 - \text{CH}_2 - \underset{\text{CH}_3}{\text{CH}} - \text{COOCH}_2 - \underset{\text{CH}_3}{\text{CH}} - \text{CH}_2\text{CH}_3$
- (c) $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOCH}_2\text{CH}_2\text{CH}_2\text{CH}_3$
- (d) $(\text{CH}_3)_3\text{C} - \text{COOCH}_2\text{C}(\text{CH}_3)_3$

159. Consider the following molecules and statements related to them : [Sep. 03, 2020 (II)]



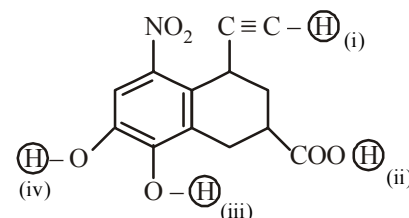
- (1) (B) is more likely to be crystalline than (A)
 (2) (B) has higher boiling point than (A)
 (3) (B) dissolves more readily than (A) in water

Identify the **correct** option from below :

[Sep. 03, 2020 (II)]

- (a) (1) and (2) are true (b) (1) and (3) are true
 (c) only (1) is true (d) (2) and (3) are true

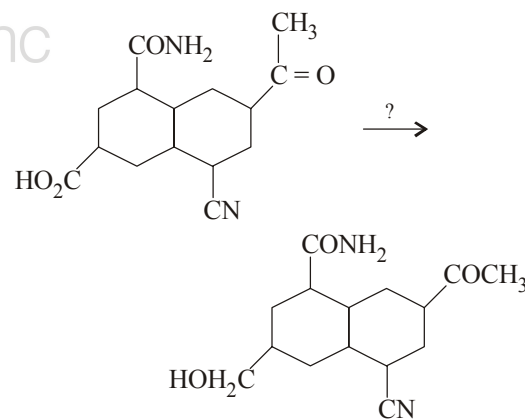
160. Arrange the following labelled hydrogens in decreasing order of acidity : [Sep. 02, 2020 (II)]



- (a) (ii) > (i) > (iii) > (iv) (b) (iii) > (ii) > (iv) > (i)
 (c) (ii) > (iii) > (iv) > (i) (d) (iii) > (ii) > (i) > (iv)

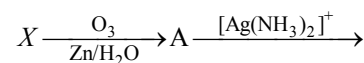
161. The most suitable reagent for the given conversion is :

[Jan. 08, 2020 (I)]



- (a) B_2H_6 (b) NaBH_4 (c) LiAlH_4 (d) H_2/Pd

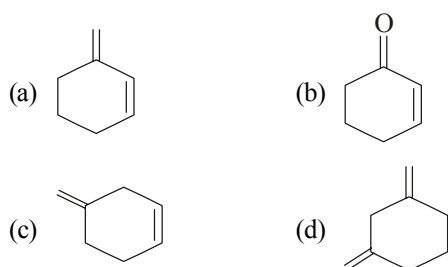
162. An unsaturated hydrocarbon X absorbs two hydrogen molecules on catalytic hydrogenation, and also gives following reaction:



B (3-oxo-hexanedicarboxylic acid)

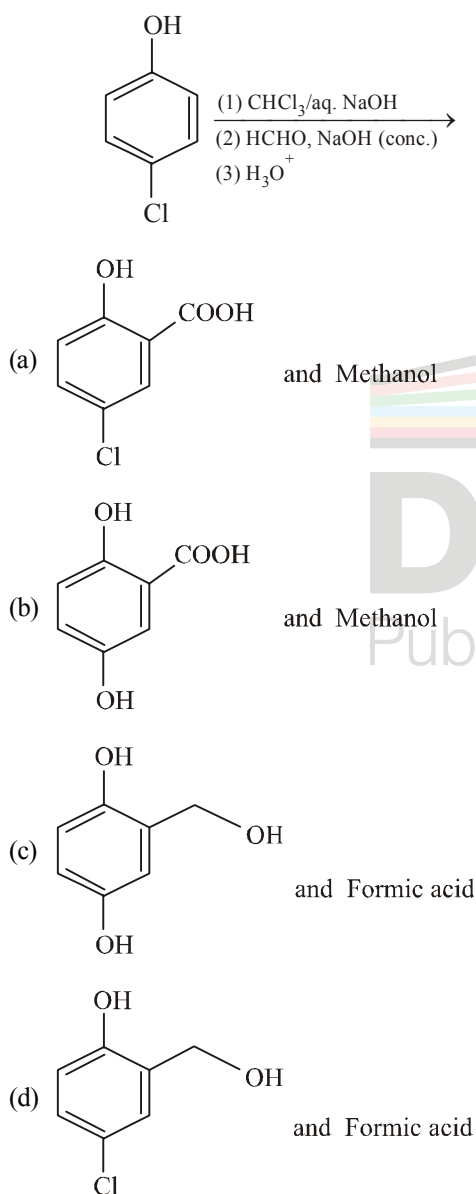
X will be :

[Jan. 08, 2020 (II)]



163. The major products of the following reaction are :

[April 12, 2019 (I)]



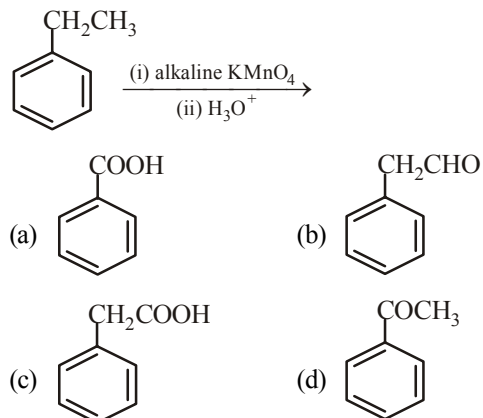
164. The major product of the following reaction is:



- (a) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CO}_2\text{CH}_3$ (b) $\text{CH}_3\text{CH}=\text{CHCH}_2\text{OH}$
 (c) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$ (d) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO}$

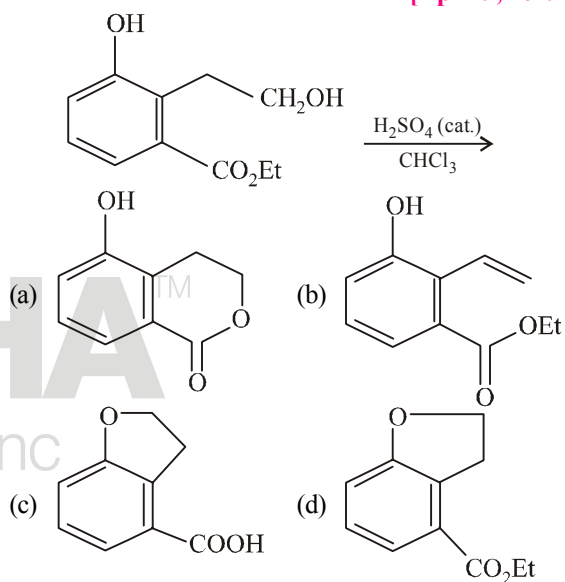
165. The major product of the following reaction is:

[April 9, 2019 (I)]



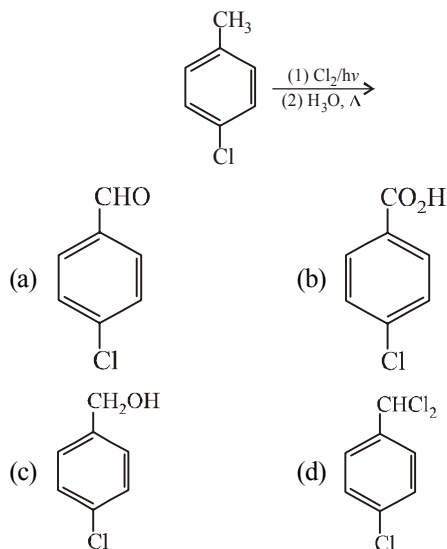
166. The major product of the following reaction is:

[April 9, 2019 (II)]



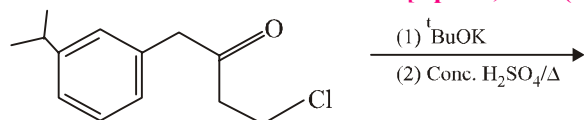
167. The major product of the following reaction is:

[April 8, 2019 (II)]



168. The major product of the following reaction is:

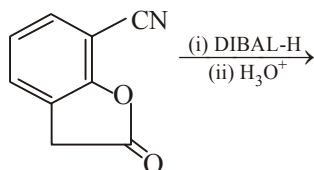
[April 8, 2019 (II)]



- (a)
- (b)
- (c)
- (d)

169. The major product of the following reaction is:

[Jan. 12, 2019 (I)]



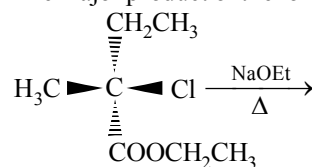
- (a)
- (b)
- (c)
- (d)

170. Among the following four aromatic compounds, which one will have the lowest melting point? [Jan. 12, 2019 (I)]

- (a)
- (b)
- (c)
- (d)

171. The major product of the following reaction is :

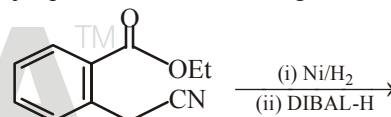
[Jan. 12, 2019 (II)]



- (a)
- (b)
- (c)
- (d)

172. The major product of the following reaction is :

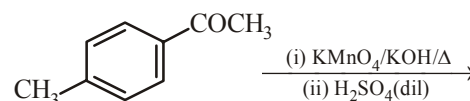
[Jan. 11, 2019 (I)]



- (a)
- (b)
- (c)
- (d)

173. The major product of the following reaction is :

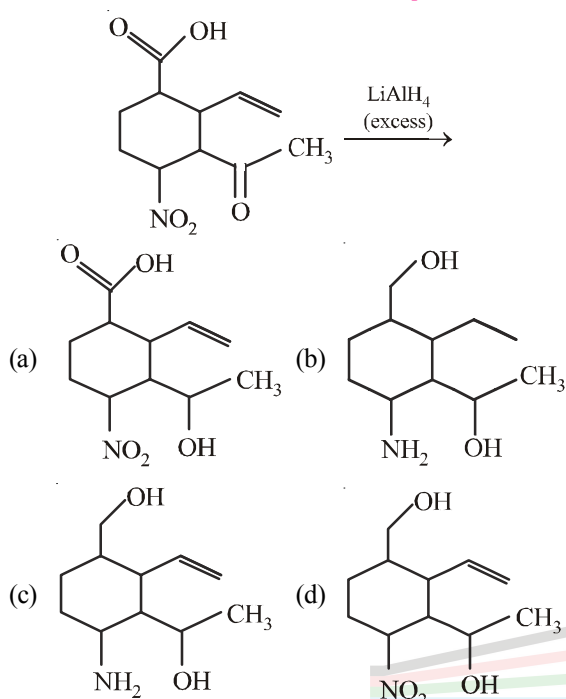
[Jan. 11, 2019 (I)]



- (a)
- (b)
- (c)
- (d)

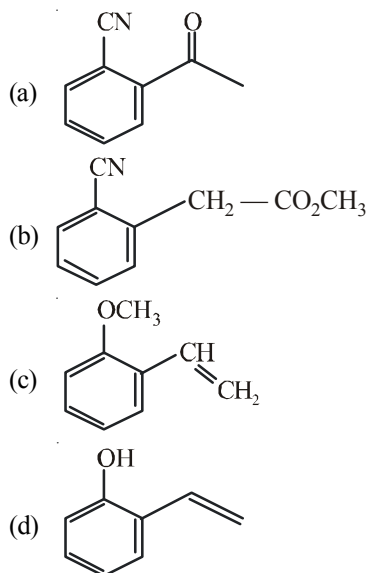
174. The major product obtained in the following reaction is:

[Jan. 11, 2019 (II)]



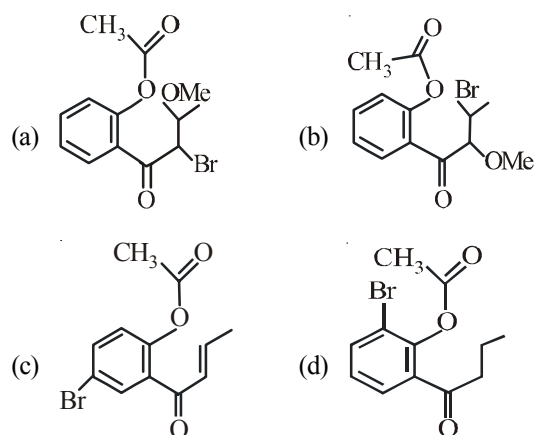
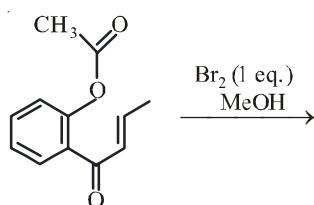
175. Which of the following compounds reacts with ethylmagnesium bromide and also decolourizes bromine water solution?

[Jan. 11, 2019 (II)]



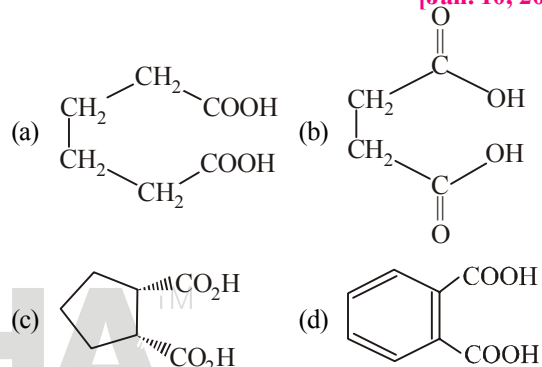
176. The major product obtained in the following conversion is:

[Jan. 11, 2019 (II)]



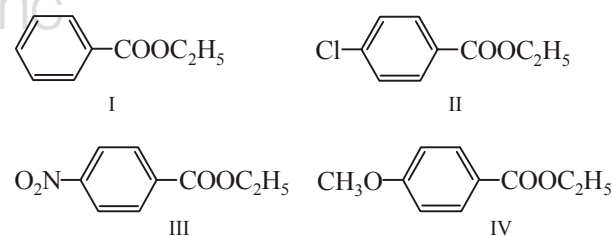
177. Which dicarboxylic acid in presence of a dehydrating agent is least reactive to give an anhydride?

[Jan. 10, 2019 (I)]



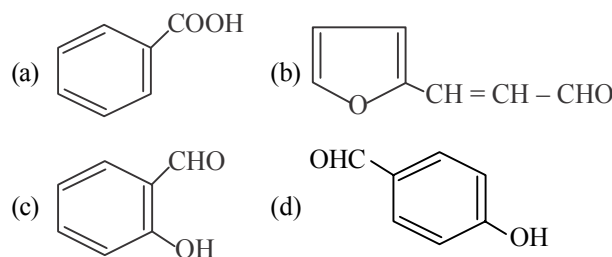
178. The decreasing order of ease of alkaline hydrolysis for the following esters is

[Jan. 10, 2019 (I)]



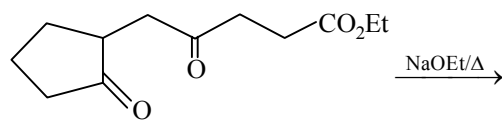
179. An aromatic compound 'A' having molecular formula $\text{C}_7\text{H}_6\text{O}_2$ on treating with aqueous ammonia and heating forms compound 'B'. The compound 'B' on reaction with molecular bromine and potassium hydroxide provides compound 'C' having molecular formula $\text{C}_6\text{H}_7\text{N}$. The structure of 'A' is:

[Jan. 10, 2019 (II)]



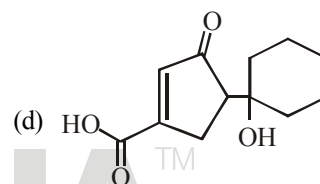
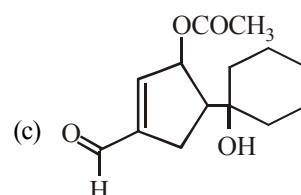
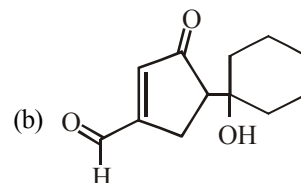
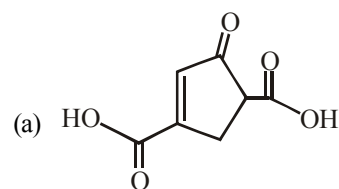
180. The major product obtained in the following reaction is:

[Online April 15, 2018 (II)]



[Jan. 10, 2019 (II)]

- (a)
- (b)
- (c)
- (d)



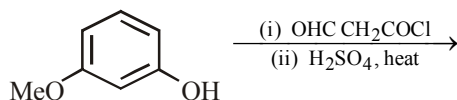
181. The correct decreasing order for acid strength is:

[Jan. 9, 2019 (I)]

- (a) $\text{NO}_2\text{CH}_2\text{COOH} > \text{FCH}_2\text{COOH} > \text{CNCH}_2\text{COOH} > \text{ClCH}_2\text{COOH}$
- (b) $\text{FCH}_2\text{COOH} > \text{CNCH}_2\text{COOH} > \text{NO}_2\text{CH}_2\text{COOH} > \text{ClCH}_2\text{COOH}$
- (c) $\text{CNCH}_2\text{COOH} > \text{NO}_2\text{CH}_2\text{COOH} > \text{FCH}_2\text{COOH} > \text{ClCH}_2\text{COOH}$
- (d) $\text{NO}_2\text{CH}_2\text{COOH} > \text{CNCH}_2\text{COOH} > \text{FCH}_2\text{COOH} > \text{ClCH}_2\text{COOH}$

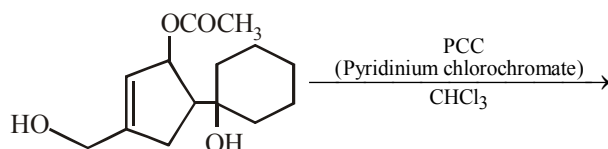
182. The major product of the given reaction is:

[Online April 16, 2018]



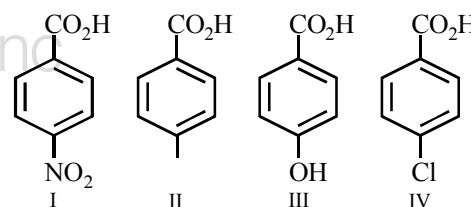
- (a)
- (b)
- (c)
- (d)

183. The major product formed in the following reaction is:



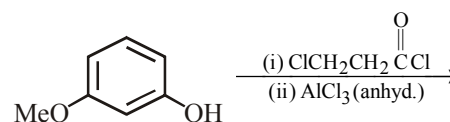
184. The increasing order of the acidity of the following carboxylic acids is:

[Online April 15, 2018 (II)]



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

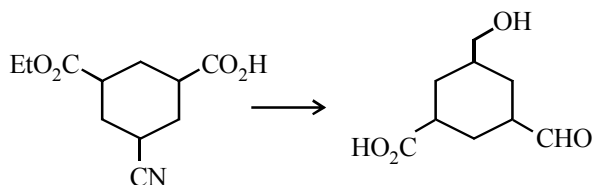
185. The major product of the following reaction is



[Online April 15, 2018 (I)]

- (a)
- (b)
- (c)
- (d)

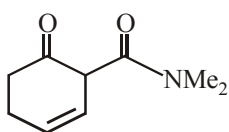
186. The reagent(s) required for the following conversion are :



[Online April 15, 2018 (I)]

- (a) (i) NaBH_4 , (ii) Raney Ni/H_2 , (iii) H_3O^+
 (b) (i) LiAlH_4 , (ii) H_3O^+
 (c) (i) B_2H_6 , (ii) DIBAL-H, (iii) H_3O^+
 (d) (i) B_2H_6 , (ii) SnCl_2/HCl , (iii) H_3O^+

187. The main reduction product of the following compound with NaBH_4 in methanol is :



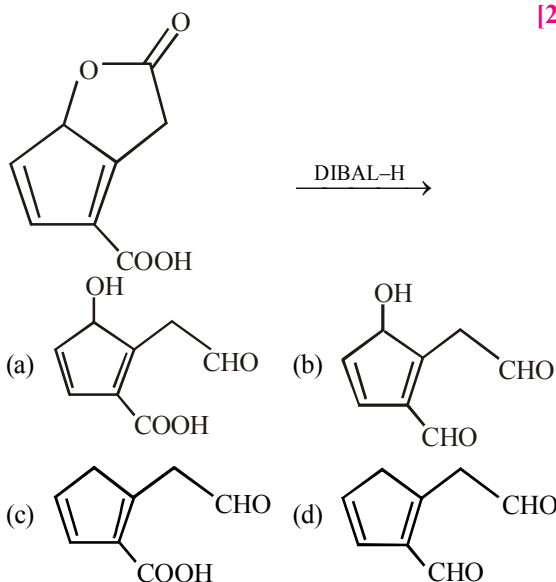
[Online April 15, 2018 (I)]

- (a) (b)
 (c) (d)

188. Sodium salt of an organic acid 'X' produces effervescences with conc. H_2SO_4 . 'X' reacts with the acidified aqueous CaCl_2 solution to give a white precipitate which decolourises acidic solution of KMnO_4 . 'X' is : [2017]

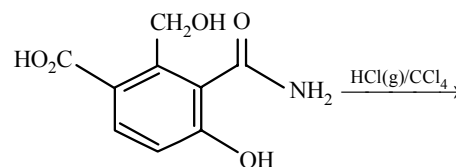
- (a) $\text{C}_6\text{H}_5\text{COONa}$ (b) HCOONa
 (c) CH_3COONa (d) $\text{Na}_2\text{C}_2\text{O}_4$

189. The major product obtained in the following reaction is : [2017]



190. The major product expected from the following reaction is:

[Online April 8, 2017]



- (a) (b)
 (c) (d)

191. Bouveault–Blanc reduction reaction involves :

[Online April 9, 2016]

- (a) Reduction of an acyl halide with H_2/Pd
 (b) Reduction of an anhydride with LiAlH_4
 (c) Reduction of an ester with $\text{Na}/\text{C}_2\text{H}_5\text{OH}$
 (d) Reduction of a carbonyl compound with Na/Hg and HCl .

192. In the presence of a small amount of phosphorous, aliphatic carboxylic acids react with chlorine or bromine to yield a compound in which α -hydrogen has been replaced by halogen. This reaction is known as :

- (a) Wolff - Kishner reaction [Online April 10, 2015]
 (b) Rosenmund reaction
 (c) Etard reaction
 (d) Hell - Volhard - Zelinsky reaction

193. Phthalic acid reacts with resorcinol in the presence of concentrated H_2SO_4 to give: [Online April 12, 2014]

- (a) Phenolphthalein (b) Alizarin
 (c) Coumarin (d) Fluorescein

194. Monocarboxylic acids are functional isomers of:

[Online April 23, 2013]

- (a) Ethers (b) Amines
 (c) Esters (d) Alcohols

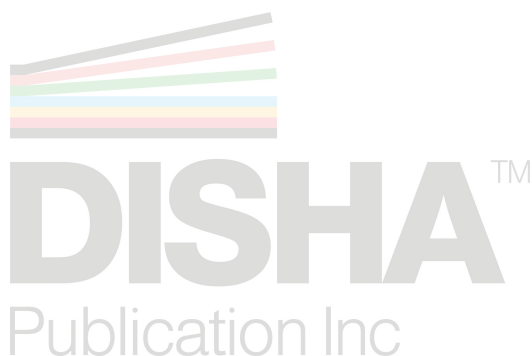
195. Maleic acid and fumaric acids are [Online May 26, 2012]

- (a) chain isomers (b) functional isomers
(c) tautomers (d) geometrical isomers

196. $\text{CH}_3\text{CH}_2\text{COOH} \xrightarrow[\text{red P}]{\text{Cl}_2} A \xrightarrow{\text{alc. KOH}} B$. What is B?

[2002]

- (a) $\text{CH}_3\text{CH}_2\text{COCl}$ (b) $\text{CH}_3\text{CH}_2\text{CHO}$
(c) $\text{CH}_2=\text{CHCOOH}$ (d) $\text{ClCH}_2\text{CH}_2\text{COOH}$



| | | | | | | | | | | | | | | | | | | | |
|----|-----|----|------|----|-----|----|-----|-----|---------|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|
| 1 | (a) | 21 | (d) | 41 | (c) | 61 | (8) | 81 | (5) | 101 | (d) | 121 | (b) | 141 | (2) | 161 | (a) | 181 | (d) |
| 2 | (a) | 22 | (d) | 42 | (c) | 62 | (4) | 82 | (c) | 102 | (b) | 122 | (b) | 142 | (a) | 162 | (c) | 182 | (b) |
| 3 | (d) | 23 | (c) | 43 | (b) | 63 | (c) | 83 | (d) | 103 | (d) | 123 | (c) | 143 | (b) | 163 | (d) | 183 | (b) |
| 4 | (c) | 24 | (60) | 44 | (a) | 64 | (a) | 84 | (a) | 104 | (b) | 124 | (a) | 144 | (a) | 164 | (b) | 184 | (a) |
| 5 | (c) | 25 | (15) | 45 | (a) | 65 | (c) | 85 | (c) | 105 | (a) | 125 | (d) | 145 | (c) | 165 | (a) | 185 | (c) |
| 6 | (a) | 26 | (d) | 46 | (b) | 66 | (c) | 86 | (c) | 106 | (b) | 126 | (a) | 146 | (d) | 166 | (a) | 186 | (d) |
| 7 | (d) | 27 | (2) | 47 | (a) | 67 | (a) | 87 | (c) | 107 | (a) | 127 | (c) | 147 | (a) | 167 | (a) | 187 | (a) |
| 8 | (c) | 28 | (c) | 48 | (b) | 68 | (c) | 88 | (b) | 108 | (d) | 128 | (a) | 148 | (c) | 168 | (c) | 188 | (d) |
| 9 | (a) | 29 | (b) | 49 | (c) | 69 | (c) | 89 | (c) | 109 | (a) | 129 | (a) | 149 | (c) | 169 | (c) | 189 | (b) |
| 10 | (a) | 30 | (a) | 50 | (a) | 70 | (3) | 90 | (a) | 110 | (d) | 130 | (c) | 150 | (78) | 170 | (d) | 190 | (c) |
| 11 | (b) | 31 | (a) | 51 | (d) | 71 | (c) | 91 | (b) | 111 | (a) | 131 | (c) | 151 | (c) | 171 | (b) | 191 | (c) |
| 12 | (c) | 32 | (d) | 52 | (3) | 72 | (b) | 92 | (c) | 112 | (a) | 132 | (a) | 152 | (1) | 172 | (d) | 192 | (d) |
| 13 | (c) | 33 | (4) | 53 | (a) | 73 | (c) | 93 | (c) | 113 | (a) | 133 | (b) | 153 | (a) | 173 | (c) | 193 | (d) |
| 14 | (b) | 34 | (a) | 54 | (c) | 74 | (a) | 94 | (b) | 114 | (a) | 134 | (d) | 154 | (a) | 174 | (c) | 194 | (c) |
| 15 | (c) | 35 | (2) | 55 | (c) | 75 | (c) | 95 | (66.67) | 115 | (b) | 135 | (c) | 155 | (b) | 175 | (d) | 195 | (d) |
| 16 | (a) | 36 | (d) | 56 | (d) | 76 | (a) | 96 | (d) | 116 | (d) | 136 | (b) | 156 | (a) | 176 | (a) | 196 | (c) |
| 17 | (c) | 37 | (c) | 57 | (b) | 77 | (c) | 97 | (d) | 117 | (c) | 137 | (d) | 157 | (a) | 177 | (a) | | |
| 18 | (c) | 38 | (3) | 58 | (d) | 78 | (c) | 98 | (c) | 118 | (c) | 138 | (a) | 158 | (a) | 178 | (b) | | |
| 19 | (d) | 39 | (a) | 59 | (b) | 79 | (3) | 99 | (b) | 119 | (c) | 139 | (c) | 159 | (d) | 179 | (a) | | |
| 20 | (d) | 40 | (3) | 60 | (1) | 80 | (2) | 100 | (b) | 120 | (c) | 140 | (c) | 160 | (c) | 180 | (d) | | |

ANSWER KEYS