

# Chapter 25

## Alcohols, Phenols and Ethers

1. The major product obtained on interaction of phenol with sodium hydroxide and carbon dioxide is:

[AIEEE-2009]

- (1) Salicylaldehyde (2) Salicylic acid  
(3) Phthalic acid (4) Benzoic acid

2. From amongst the following alcohols the one that would react fastest with conc. HCl and anhydrous  $\text{ZnCl}_2$ , is

[AIEEE-2010]

- (1) 1-Butanol (2) 2-Butanol  
(3) 2-Methylpropan-2-ol (4) 2-Methylpropanol

3. The correct order of acid strength of the following compounds is

[AIEEE-2011]

- A. Phenol  
B. p-Cresol  
C. m-Nitrophenol  
D. p-Nitrophenol

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

4. Consider the following reaction

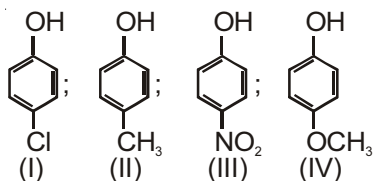


Among the following, which one cannot be formed as a product under any conditions? [AIEEE-2011]

- (1) Diethyl ether  
(2) Ethyl-hydrogen sulphate  
(3) Ethylene  
(4) Acetylene

5. Arrange the following compounds in order of decreasing acidity

[JEE (Main)-2013]



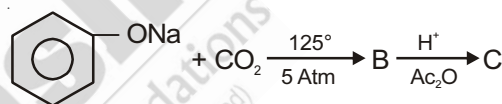
- (1)  $\text{II} > \text{IV} > \text{I} > \text{III}$  (2)  $\text{I} > \text{II} > \text{III} > \text{IV}$   
(3)  $\text{III} > \text{I} > \text{II} > \text{IV}$  (4)  $\text{IV} > \text{III} > \text{I} > \text{II}$

6. An unknown alcohol is treated with the "Lucas reagent" to determine whether the alcohol is primary, secondary or tertiary. Which alcohol reacts fastest and by what mechanism?

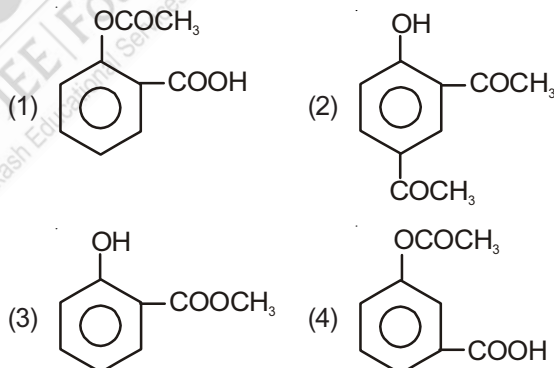
[JEE (Main)-2013]

- (1) Secondary alcohol by  $\text{S}_{\text{N}}1$   
(2) Tertiary alcohol by  $\text{S}_{\text{N}}1$   
(3) Secondary alcohol by  $\text{S}_{\text{N}}2$   
(4) Tertiary alcohol by  $\text{S}_{\text{N}}2$

7. Sodium phenoxide when heated with  $\text{CO}_2$  under pressure at  $125^\circ\text{C}$  yields a product which on acetylation produces C.

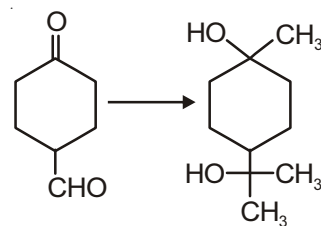


The major product C would be [JEE (Main)-2014]



8. The correct sequence of reagents for the following conversion will be

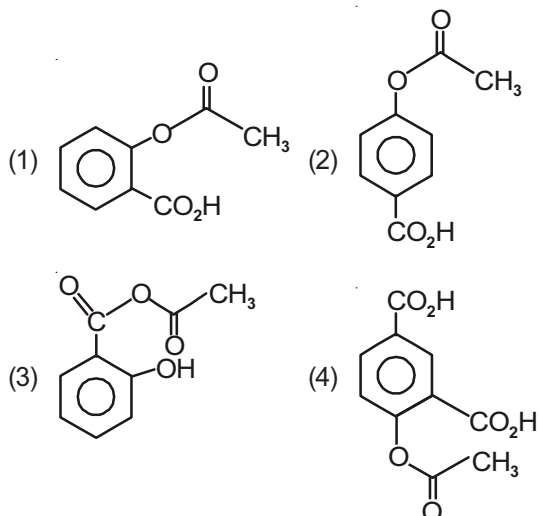
[JEE (Main)-2017]



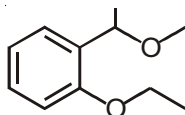
- (1)  $\text{CH}_3\text{MgBr}$ ,  $[\text{Ag}(\text{NH}_3)_2]^+\text{OH}^-$ ,  $\text{H}^+/\text{CH}_3\text{OH}$   
(2)  $[\text{Ag}(\text{NH}_3)_2]^+\text{OH}^-$ ,  $\text{CH}_3\text{MgBr}$ ,  $\text{H}^+/\text{CH}_3\text{OH}$   
(3)  $[\text{Ag}(\text{NH}_3)_2]^+\text{OH}^-$ ,  $\text{H}^+/\text{CH}_3\text{OH}$ ,  $\text{CH}_3\text{MgBr}$   
(4)  $\text{CH}_3\text{MgBr}$ ,  $\text{H}^+/\text{CH}_3\text{OH}$ ,  $[\text{Ag}(\text{NH}_3)_2]^+\text{OH}^-$

9. Phenol on treatment with  $\text{CO}_2$  in the presence of  $\text{NaOH}$  followed by acidification produces compound X as the major product. X on treatment with  $(\text{CH}_3\text{CO})_2\text{O}$  in the presence of catalytic amount of  $\text{H}_2\text{SO}_4$  produces

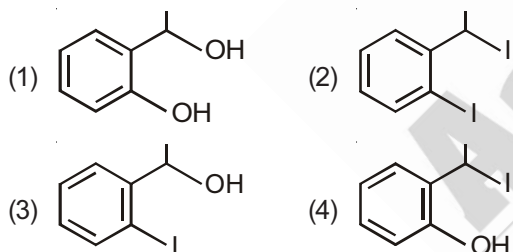
[JEE (Main)-2018]



10. The major product formed in the following reaction is

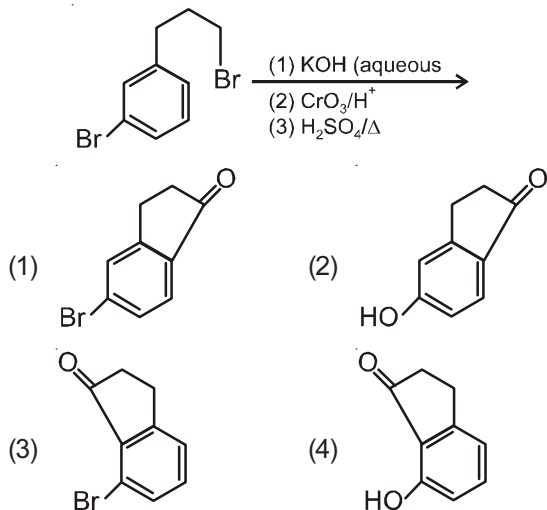


[JEE (Main)-2018]



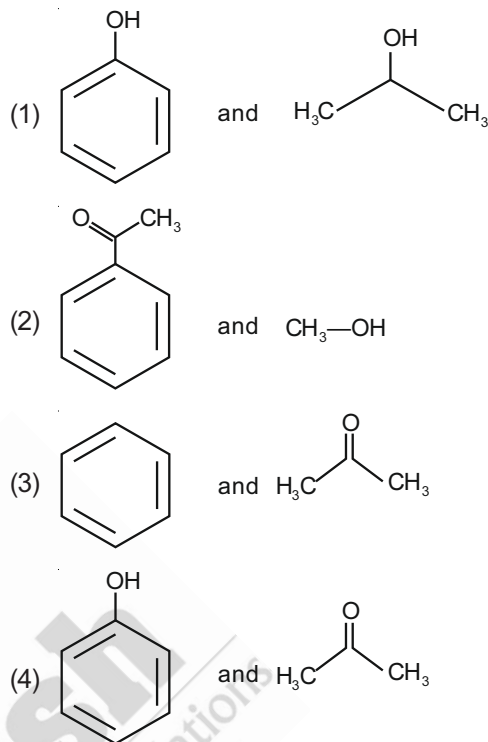
11. The major product of the following reaction is

[JEE (Main)-2019]



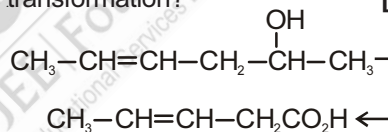
12. The products formed in the reaction of cumene with  $\text{O}_2$  followed by treatment with dil.  $\text{HCl}$  are

[JEE (Main)-2019]



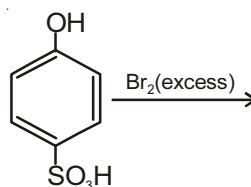
13. Which is the most suitable reagent for the following transformation?

[JEE (Main)-2019]

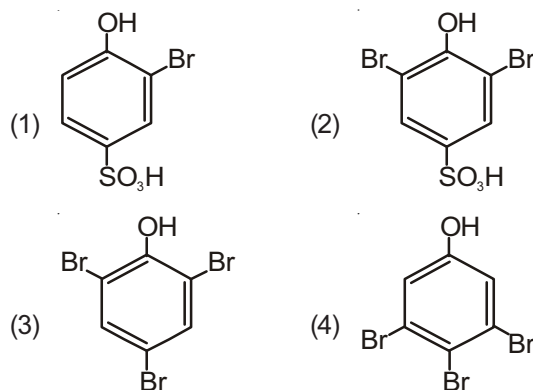


- (1)  $\text{I}_2/\text{NaOH}$  (2) Alkaline  $\text{KMnO}_4$   
 (3) Tollen's reagent (4)  $\text{CrO}_2\text{Cl}_2/\text{CS}_2$

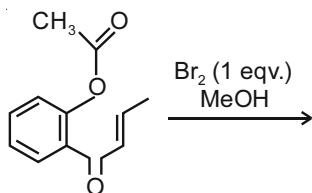
14. The major product of the following reaction is



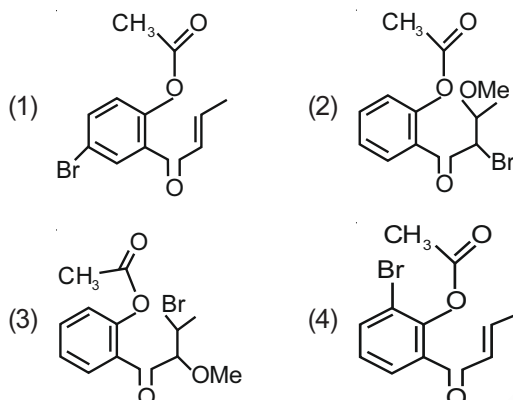
[JEE (Main)-2019]



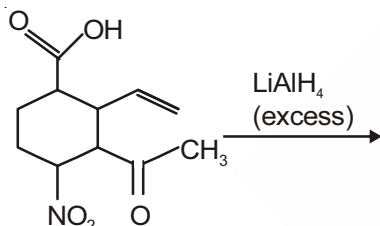
15. The major product obtained in the following conversion is



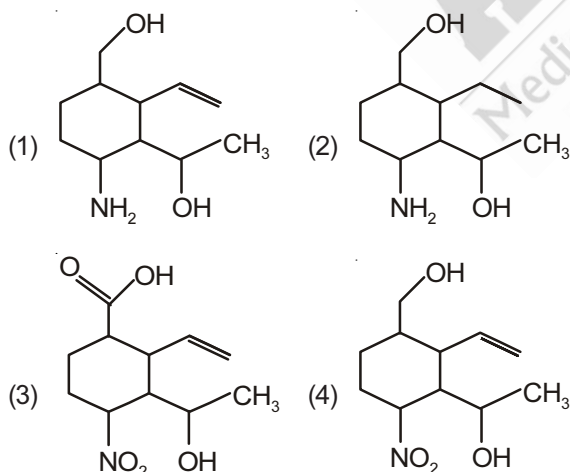
[JEE (Main)-2019]



16. The major product obtained in the following reaction is



[JEE (Main)-2019]

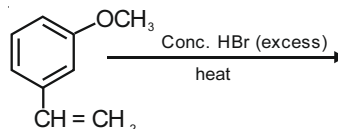


17.  $\text{CH}_3\text{CH}_2-\text{C}(\text{OH})(\text{Ph})-\text{CH}_3$  cannot be prepared by

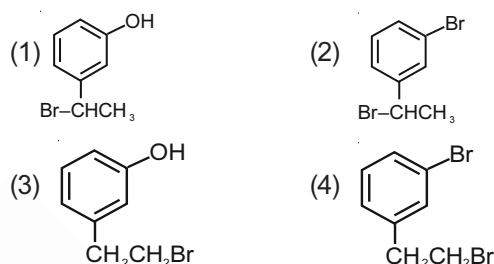
[JEE (Main)-2019]

- (1)  $\text{PhCOCH}_2\text{CH}_3 + \text{CH}_3\text{MgX}$   
 (2)  $\text{CH}_3\text{CH}_2\text{COCH}_3 + \text{PhMgX}$   
 (3)  $\text{HCHO} + \text{PhCH}(\text{CH}_3)\text{CH}_2\text{MgX}$   
 (4)  $\text{PhCOCH}_3 + \text{CH}_3\text{CH}_2\text{MgX}$

18. The major product of the following reaction is



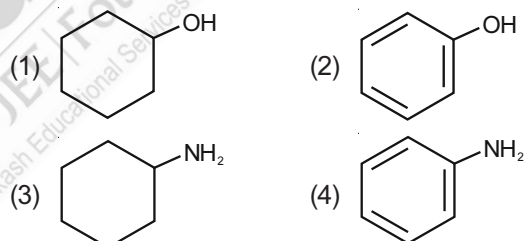
[JEE (Main)-2019]



19. The organic compound that gives following qualitative analysis is

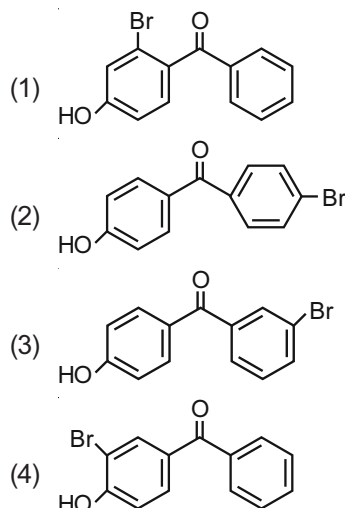
Test	Inference
(a) Dil. HCl	Insoluble
(b) NaOH solution	Soluble
(c) $\text{Br}_2/\text{water}$	Decolourization

[JEE (Main)-2019]

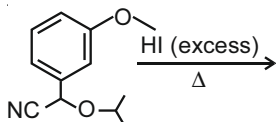


20. p-Hydroxybenzophenone upon reaction with bromine in carbon tetrachloride gives

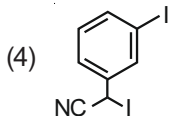
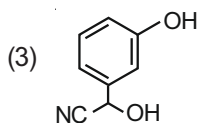
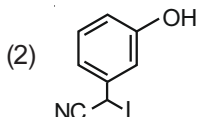
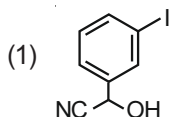
[JEE (Main)-2019]



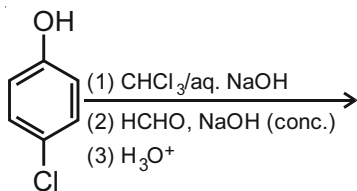
21. The major product of the following reaction is :



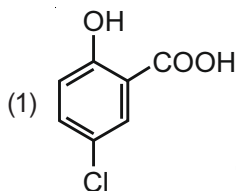
[JEE (Main)-2019]



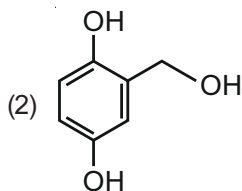
22. The major products of the following reaction are :



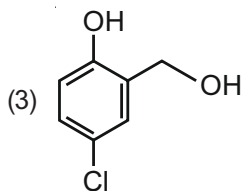
[JEE (Main)-2019]



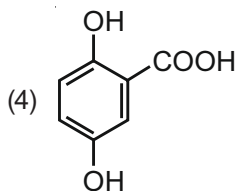
and Methanol



and Formic acid



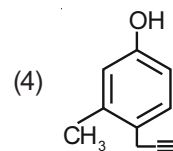
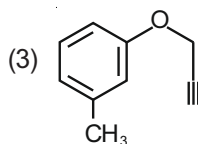
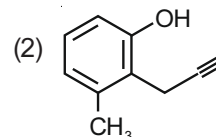
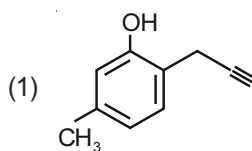
and Formic acid



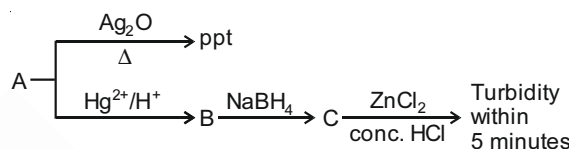
and Methanol

23. What will be the major product when m-cresol is reacted with propargyl bromide ( $\text{HC} \equiv \text{C}-\text{CH}_2\text{Br}$ ) in presence of  $\text{K}_2\text{CO}_3$  in acetone?

[JEE (Main)-2019]

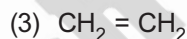
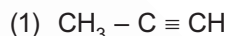


24. Consider the following reactions :



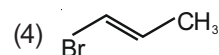
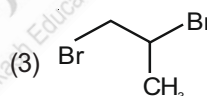
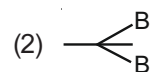
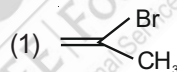
'A' is

[JEE (Main)-2019]

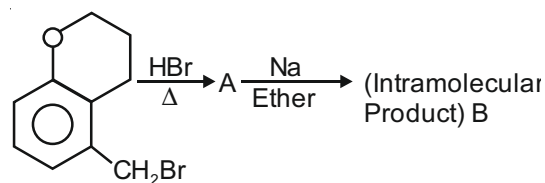


25. 1-methylethylene oxide when treated with an excess of HBr produces:

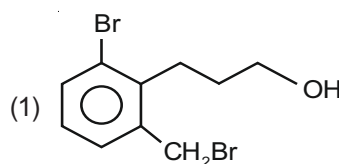
[JEE (Main)-2020]



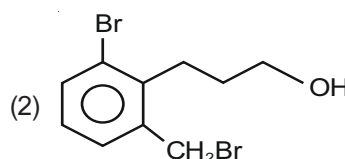
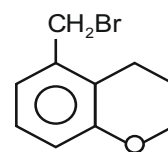
26. In the following reaction sequence, structures of A and B, respectively will be



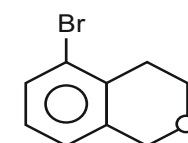
[JEE (Main)-2020]

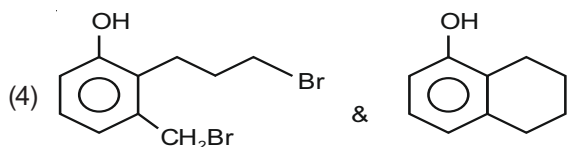
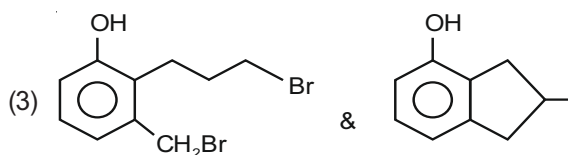


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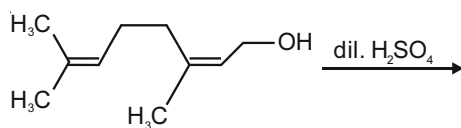


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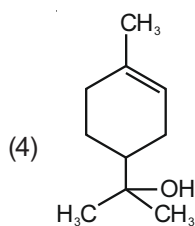
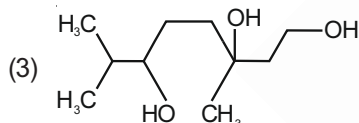
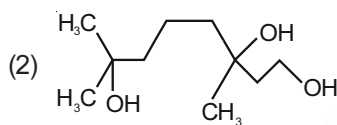
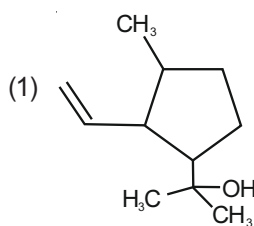




27. The major product of the following reaction is

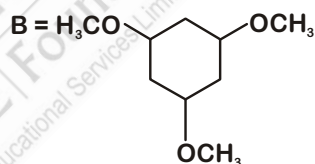
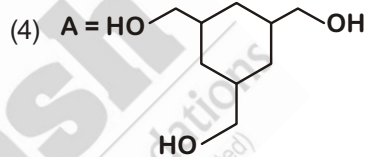
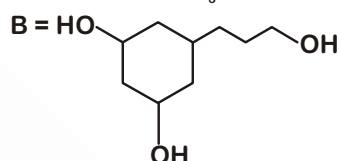
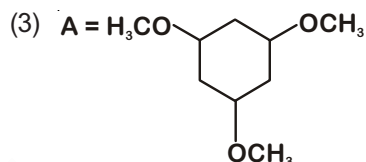
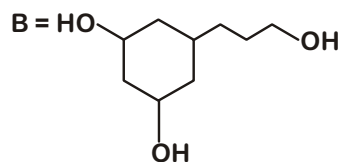
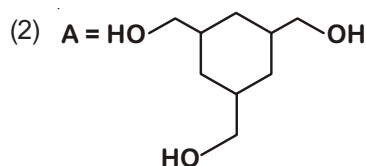
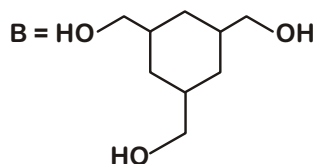
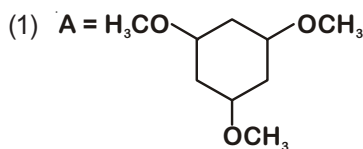


[JEE (Main)-2020]

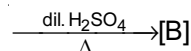
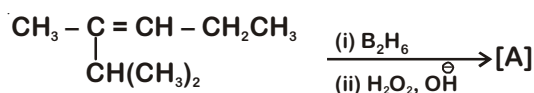


28. Among the compounds A and B with molecular formula  $C_9H_{18}O_3$ , A is having higher boiling point than B. The possible structures of A and B are

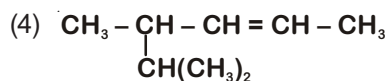
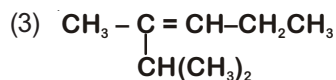
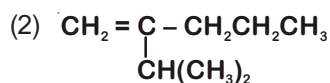
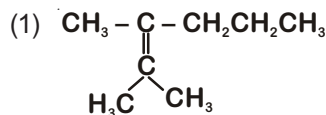
[JEE (Main)-2020]



29. The major product [B] in the following sequence of reactions is



[JEE (Main)-2020]

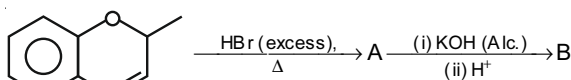


30. Preparation of Bakelite proceeds via reactions

[JEE (Main)-2020]

- (1) Electrophilic substitution and dehydration
- (2) Electrophilic addition and dehydration
- (3) Nucleophilic addition and dehydration
- (4) Condensation and elimination

31. The major aromatic product C in the following reaction sequence will be



[JEE (Main)-2020]

- (1)
- (2)
- (3)
- (4)

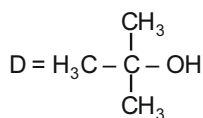
32. Two compounds A and B with same molecular formula ( $C_3H_6O$ ) undergo Grignard's reaction with methylmagnesium bromide to give products C and D. Products C and D show following chemical tests.

Test	C	D
Ceric ammonium nitrate Test	Positive	Positive
Lucas Test	Turbidity obtained after five minutes	Turbidity obtained immediately
Iodoform Test	Positive	Negative

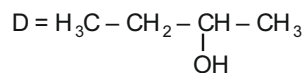
C and D respectively are

[JEE (Main)-2020]

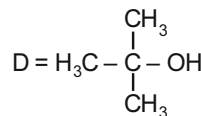
- (1)  $C = H_3C - CH_2 - \underset{\text{OH}}{\underset{|}{CH}} - CH_3$ ;



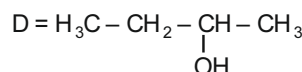
- (2)  $C = H_3C - CH_2 - CH_2 - CH_2 - OH$ ;



- (3)  $C = H_3C - CH_2 - CH_2 - CH_2 - OH$ ;



- (4)  $C = H_3C - \underset{\text{CH}_3}{\underset{|}{\overset{\text{CH}_3}{C}}} - OH$ ;

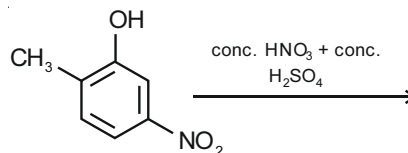


33. An organic compound 'A' ( $C_9H_{10}O$ ) when treated with conc. HI undergoes cleavage to yield compounds 'B' and 'C'. 'B' gives yellow precipitate with  $AgNO_3$  whereas 'C' tautomerizes to 'D'. 'D' gives positive iodoform test. 'A' could be

[JEE (Main)-2020]

- (1)
- (2)
- (3)
- (4)

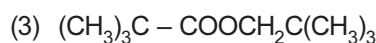
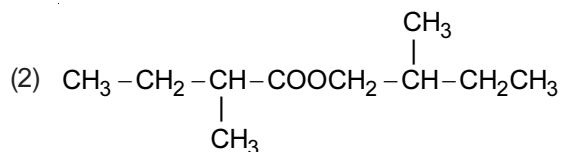
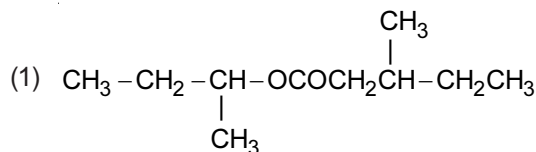
34. The major product of the following reaction is:



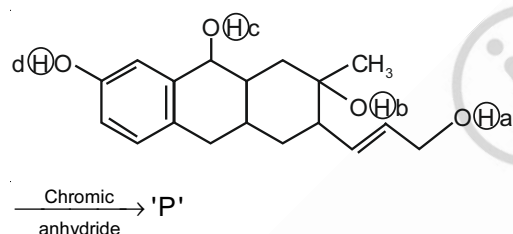
[JEE (Main)-2020]

- (1)
- (2)
- (3)
- (4)

35. An organic compound [A], molecular formula  $C_{10}H_{20}O_2$  was hydrolyzed with dilute sulphuric acid to give a carboxylic acid [B] and an alcohol [C]. Oxidation of [C] with  $CrO_3 - H_2SO_4$  produced [B]. Which of the following structures are not possible for [A]? [JEE (Main)-2020]

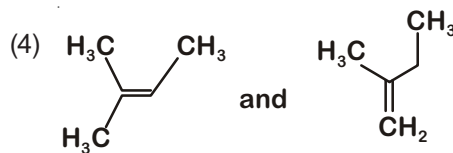
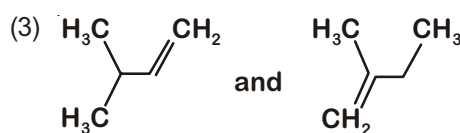
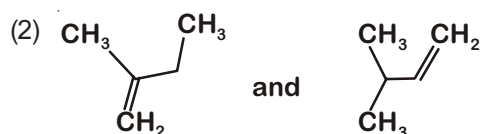
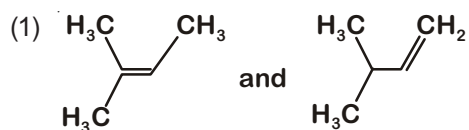


36. Consider the following reaction :

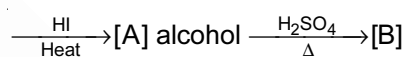
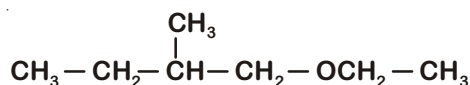


The product 'P' gives positive ceric ammonium nitrate test. This is because of the presence of which of these  $-OH$  group(s)? [JEE (Main)-2020]

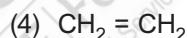
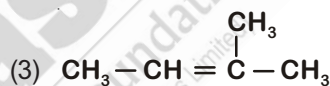
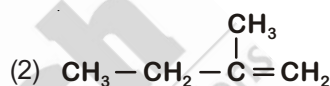
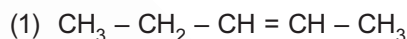
- (1) (d) only  
 (2) (c) and (d)  
 (3) (b) only  
 (4) (b) and (d)
37. When neopentyl alcohol is heated with an acid, it slowly converted into an 85 : 15 mixture of alkenes A and B, respectively. What are these alkenes? [JEE (Main)-2020]



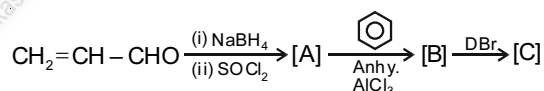
38. The major product [B] in the following reactions is



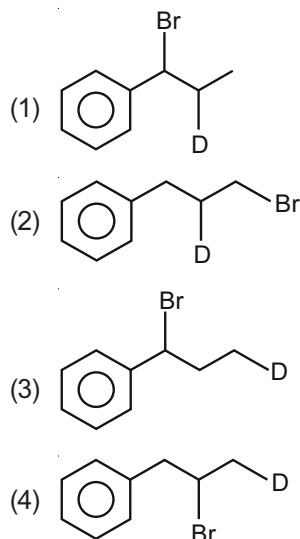
[JEE (Main)-2020]



39. The major product [C] of the following reaction sequence will be

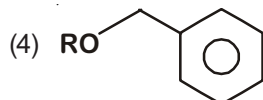
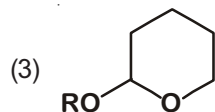
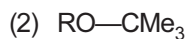
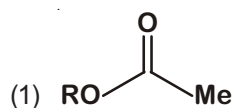


[JEE (Main)-2020]

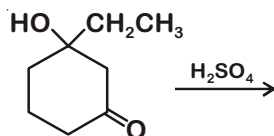




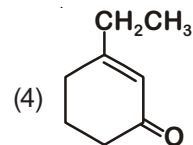
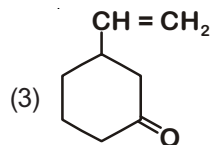
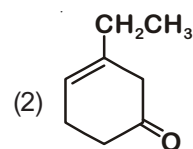
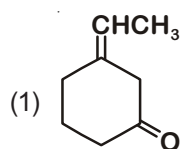
40. Which of the following derivatives of alcohols is unstable in an aqueous base? [JEE (Main)-2020]



41. The major product of the following reaction is



[JEE (Main)-2020]



42. A solution of phenol in chloroform when treated with aqueous NaOH gives compound P as a major product. The mass percentage of carbon in P is \_\_\_\_\_. (to the nearest integer)

(Atomic mass : C = 12; H = 1; O = 16)

[JEE (Main)-2020]



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