Organic Chemistry – Some Basic Principles and Techniques & Hydrocarbons

1. Complete combustion of $1.80\ g$ of an oxygen containing compound $(C_xH_yO_z)$ gave $2.64\ g$ of CO_2 and $1.08\ g$ of H_2O. The percentage of oxygen in the organic compound is:

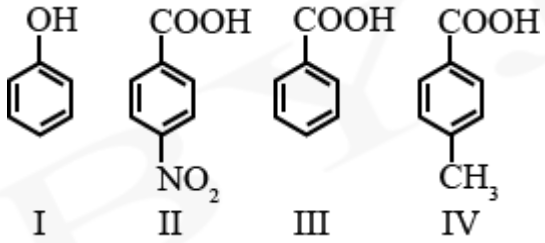
   A. 50.33

   B. 53.33

   C. 51.63

   D. 63.53

2. The correct order of acid character of the following compounds is :



   A. $IV > III > II > I$

   B. $II > III > IV > I$

   C. $I > II > III > IV$

   D. $III > II > I > IV$

3. The types of hybridisation on the five carbon atoms from left to right in the molecule
   $CH_3 - CH = C = CH - CH_3$ are :

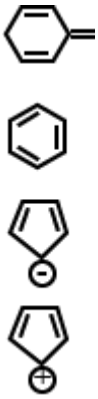
   A. $sp^3, sp^2, sp^2, sp^2, sp^3$

   B. $sp^3, sp, sp^2, sp^2, sp^3$

   C. $sp^3, sp^2, sp, sp^2, sp^3$

   D. $sp^3, sp^2, sp^2, sp, sp^3$

4. Among the following, the aromatic compounds are:



Choose the correct answer from the following options:

A. (A), (B) and (C) only

B. (B), (C) and (D) only

C. (B) and (C) only

D. (A) and (B) only

5. Which of the following is least basic?

A. $(CH_3CO)\ddot{N}HC_2H_5$

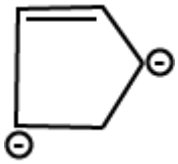
B. $(CH_3CO)_2\ddot{N}H$

C. $(C_2H_5)_2\ddot{N}H$

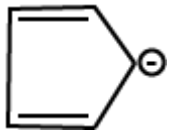
D. $(C_2H_5)_3\ddot{N}$

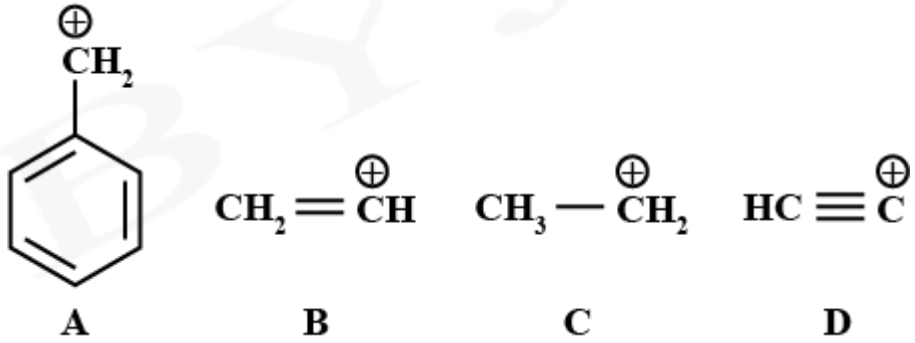
6. Which of the following is an aromatic compound?

A. 

B. 

C. 

D. 

7. 

The correct order of stability of given carbocation is

A. C > A > D > B

B. D > B > C > A

C. A > C > B > D

D. D > B > A > C

Organic Chemistry – Some Basic Principles and Techniques & Hydrocarbons

8. Compound with molecular formula C_3H_6O can show:

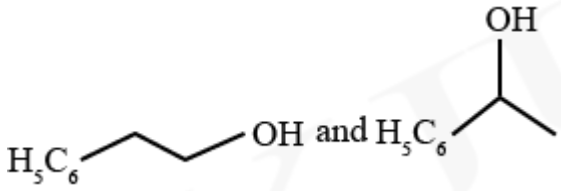
   A. Both positional isomerism and metamerism

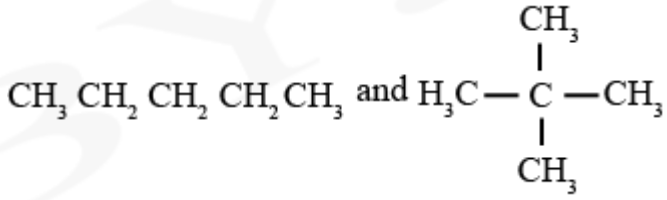
   B. Metamerism

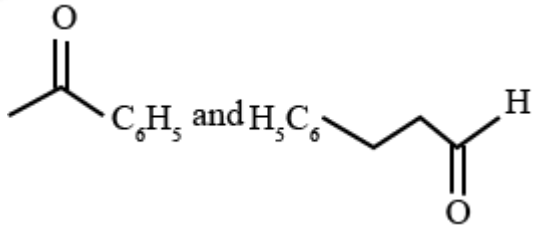
   C. Positional isomerism

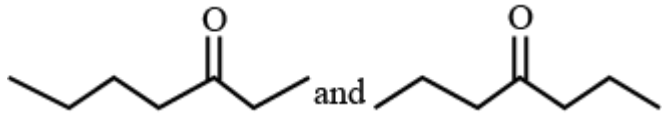
   D. Functional group isomerism

9. Which one of the following pairs of isomers is an example of metamerism?

   A. 

   B. 

   C. 

   D. 

10. Which purification technique is used for high boiling organic liquid compound (decomposes near its boiling point)?

    A. Simple distillation

    B. Steam distillation

    C. Fractional distillation

    D. Reduced pressure distillation

Organic Chemistry – Some Basic Principles and Techniques & Hydrocarbons

11. Which of the following molecules does not show stereo isomerism?

A. 3, 4-Dimethylhex-3-ene

B. 3-Methylhex-1-ene

C. 3-Ethylhex-3-ene

D. 4-Methylhex-1-ene

12. In chromotography technique, the purification of compound is independent of:

A. Mobility or flow of solvent system

B. Solubility of the compound

C. Length of the column or TLC plate

D. Physical state of the pure compound

13. A. Phenyl methanamine
B. N,N-Dimethylaniline
C. N-Methyl aniline
D. Benzenamine

Choose the correct order of basic nature of the above amines.

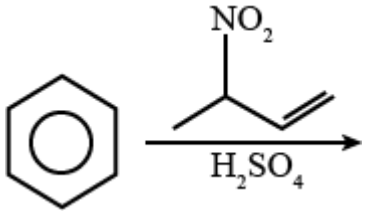
A. $A > C > B > D$

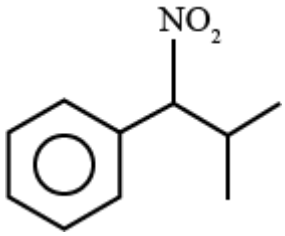
B. $D > B > C > A$

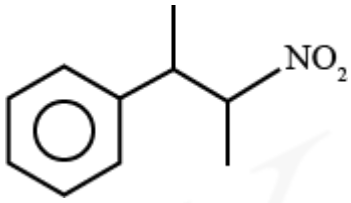
C. $D > C < B > A$

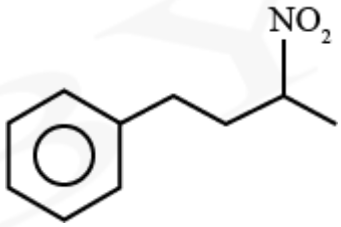
D. $A > B > C > D$

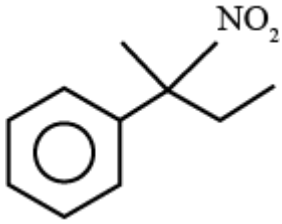
14. The major product of the following reaction is :



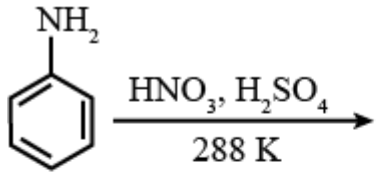
A.


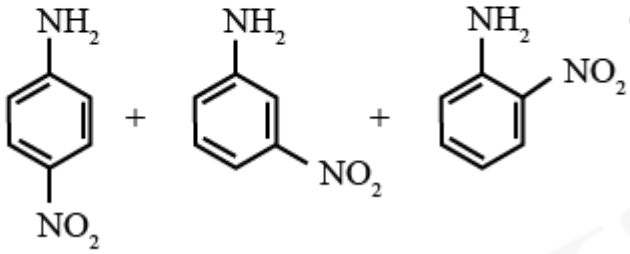
B.


C.


D.


Organic Chemistry – Some Basic Principles and Techniques & Hydrocarbons

15. 



(A) (B) (C)

Correct statement about the given chemical reaction is :

A. The reaction will form sulpnonated product instead of nitration.

B. Reaction is possible and compound (B) will be the major product.

C. Reaction is possible and compound (A) will be major product.

D. $-\ddot{N}H_2$ group is ortho and para directive so product (B) is not possible

16. An Organic compounds 'A' C_4H_8 on treatment with $KMnO_4/H^+$ yields compound 'B' C_3H_6O. Compound 'A' also yields compound 'B' an ozonolysis. Compound 'A' is

A. Cyclobutane

B. 2-Methylpropene

C. But-2-ene

D. 1-Methylcyclopropane

17. Presence of which regent will affect the reversibility of the following reaction, and change it to a irreversible reaction.

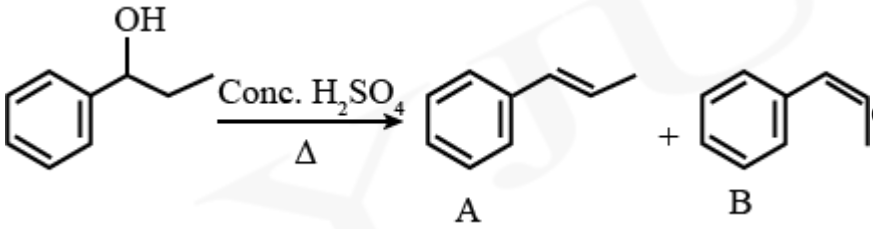
$$CH_4 + I_2 \underset{\text{Reversible}}{\overset{hv}{\rightleftharpoons}} CH_3 - I + HI$$

A. Dilute HNO_2

B. Liquid NH_3

C. HOCl

D. Concentrated HIO_3

18. 

Consider the above reaction, and choose the correct statement:

A. Both compounds A and B are formed equally

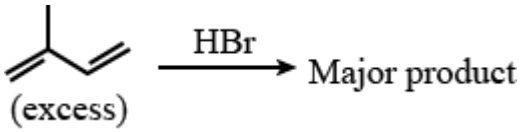
B. Compound A will be the major product

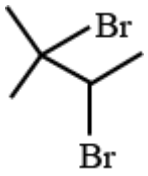
C. Compound B will be the major product

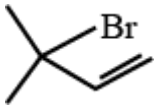
D. The reaction is not possible in acidic medium

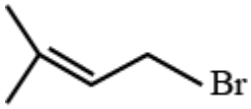
Organic Chemistry – Some Basic Principles and Techniques & Hydrocarbons

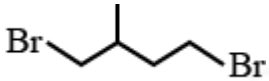
19. The major product formed in the following reaction



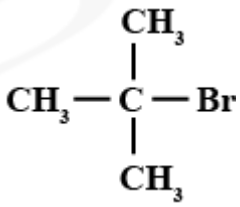
A. 

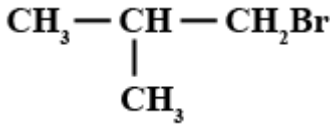
B. 

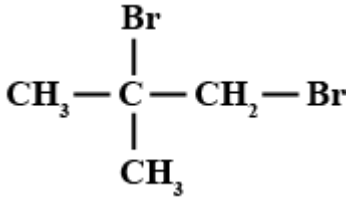
C. 

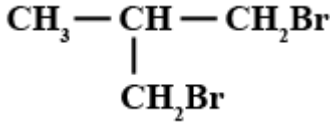
D. 

20. Excess of isobutane on reaction with Br_2 in presence of light at 125^oC gives which one of the following, as the major product?

A. 

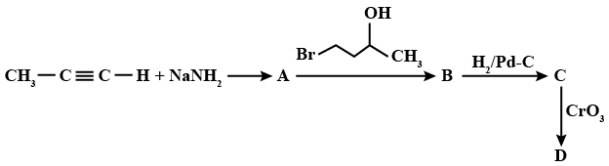
B. 

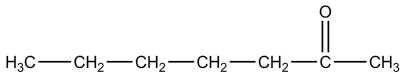
C. 

D. 

Organic Chemistry – Some Basic Principles and Techniques & Hydrocarbons

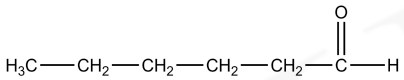
21. In the following sequence of reactions, the final product 'D' is :



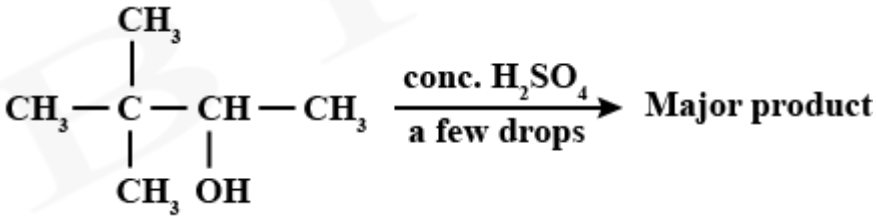
A. 

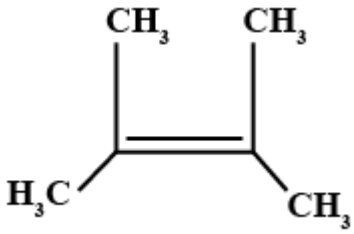
B. $H_3C - CH = CH - CH(OH) - CH_2 - CH_2 - CH_3$

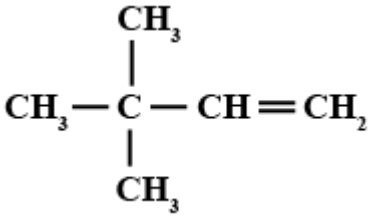
C. $CH_3 - CH = CH - CH_2 - CH_2 - CH_2 - COOH$

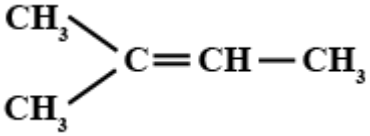
D. 

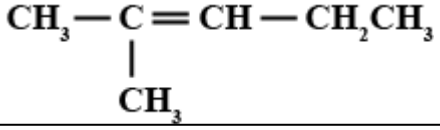
22. The major product formed in the following reaction is :



A. 

B. 

C. 

D. 

23. Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R)
Assertion (A) : Treatment of bromine water with propene yields 1-bromopropan -2 - ol
Reason (R) : Attack of water on bromonium ion follows Markovnikov rule and results in 1- bromopropan -2 - ol
In the light of the above statements, choose the most appropriate answer fron the options given below:

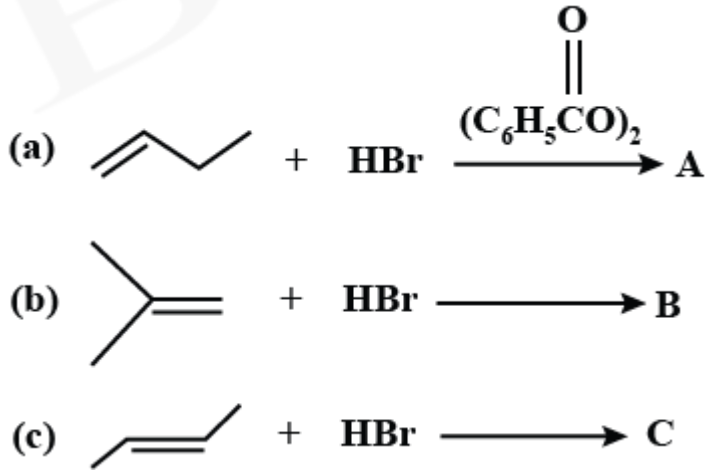
A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. (A) is true but (R) is false

C. Both (A) and (R) are true but (R) is NOT the corect explanation of (A)

D. (A) is false but (R) is true

24. The increasing order of the boiling point of the major products A, B, and C of the following reaction will be:



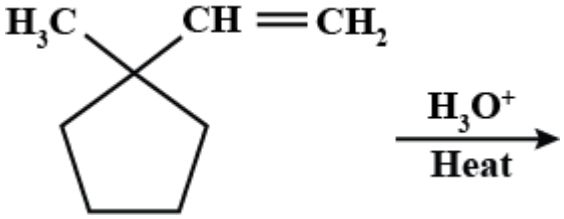
A. B < C < A

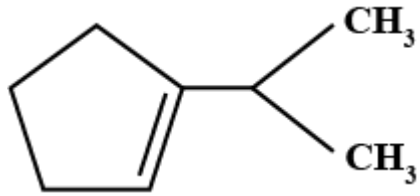
B. C < A < B

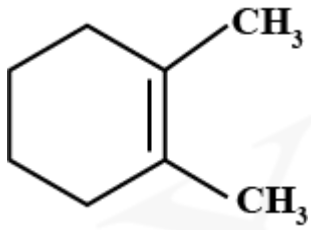
C. A < B < C

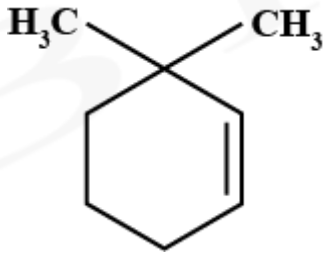
D. A < C < B

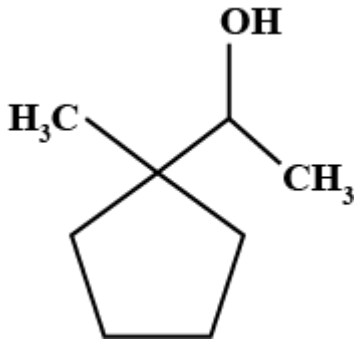
25. The major product in following reaction is:



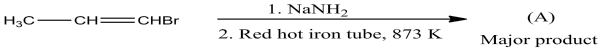
A. 

B. 

C. 

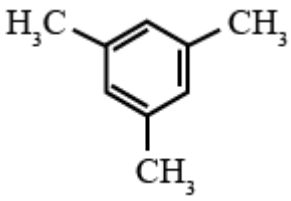
D. 

26. For the given reaction:

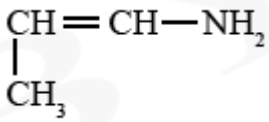


What is 'A' ?

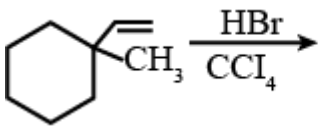
A. 

B. 

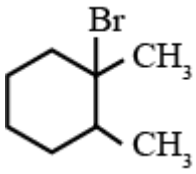
C. $CH_3CH_2CH_2NH_2$

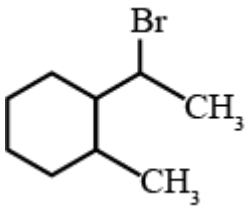
D. 

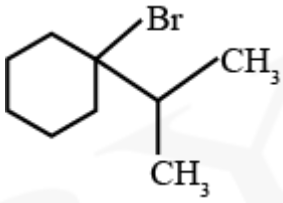
Organic Chemistry – Some Basic Principles and Techniques & Hydrocarbons

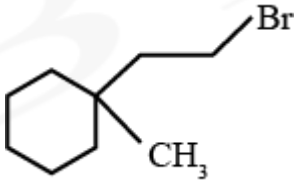
27. 

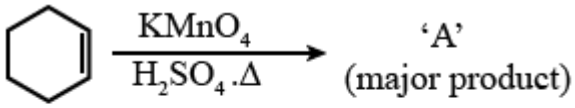
Product "A" in the above chemical reaction is

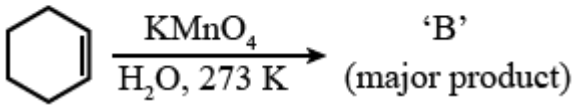
A. 

B. 

C. 

D. 

28. 



For above chemical reactions, identify the correct statement from the following.

A. Compound 'A' is dicarboxylic acid and compound 'B' is diol.

B. Compound 'A' is diol and compound 'B' is discarboxylic acid.

C. Both compound 'A' and compound 'B' are discarboxylic acids.

D. Both compound 'A' and compound 'B' are diols.

29. The total of $C-C$ sigma bonds/s is mesityl oxide $(C_6H_{10}O)$ is (Round off to the Nearest Integer).

30. In Duma's method of estimation of nitrogen, 0.1840 g of an organic compound gave 30 mL of nitrogen collected at 287 K and 758 mm of Hg pressure. The percentage composition of nitrogen in the compound is ___. (Round to the nearest integer). [Given: Aqueous tension at 287 K = 14 mm of Hg]