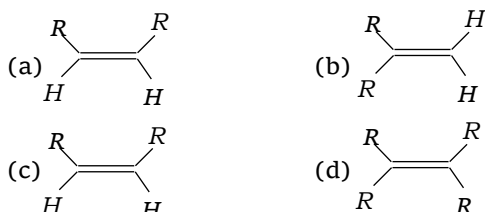


## Hydrocarbon

## Self Evaluation Test -24

1. Which one of the following alkenes will react fastest with  $H_2$  under catalytic hydro-genation condition

[IIT-JEE (Screening) 2000; CBSE PMT 2005]



2. On cracking petrol, we get [CPMT 1980]

- (a)  $CH_4$   
 (b)  $C_3H_6$   
 (c) Both (a) and (b)  
 (d)  $CH_3 + CH_4 + C_2H_6$  + alcohols

3. Cetane is a compound which has very good ignition property. Chemically it is

- (a)  $CH_3(CH_2)_{14}CH_3$   
 (b)  $(CH_3)_3C(CH_2)_{11}CH_3$   
 (c)  $C_{17}H_{34}$   
 (d) None of these

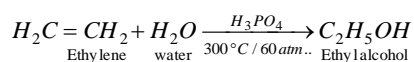
4. Which one of these is not compatible with arenes [CBSE PMT 1998]

- (a) Greater stability  
 (b) Delocalisation of  $\pi$ -electrons  
 (c) Electrophilic additions  
 (d) Resonance

5. Which of the following is an electrophile [BHU 1998]

- (a)  $H_2O$  (b)  $NH_3$   
 (c)  $AlCl_3$  (d)  $C_2H_5NH_2$

6. The reaction,

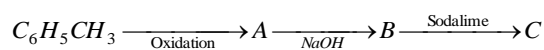


is called :

[Pb. CET 2001]

- (a) Hydration (b) Sublimation  
 (c) Dehydration (d) Substitution

7. In reaction



Then C is

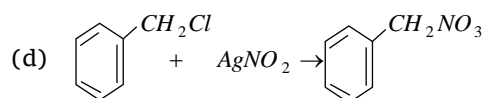
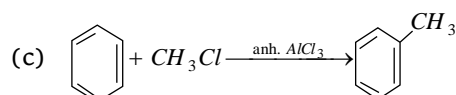
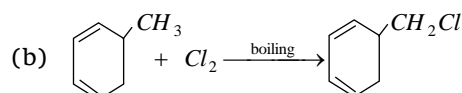
[MP PET 2004]

- (a)  $C_6H_6$  (b)  $C_6H_5OH$

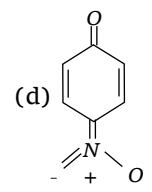
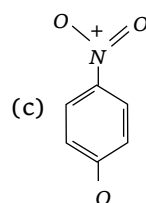
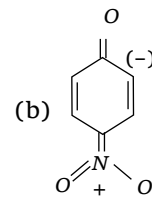
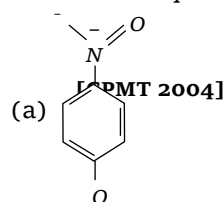
- (c)  $C_6H_5COONa$  (d)  $C_6H_5ONa$

8. Which one of the following is a free-radical substitution reaction [CBSE PMT 2003]

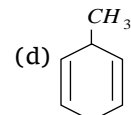
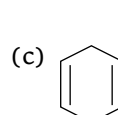
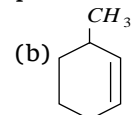
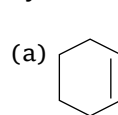
- (a)  $CH_3CHO + HCN \rightarrow CH_3CH(OH)CN$



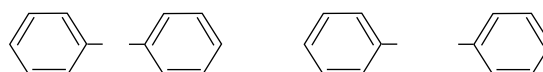
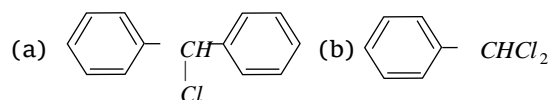
9. The most unlikely representation of resonance structures of *p*-nitrophenoxide ion is [IIT-JEE 1999]

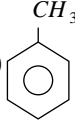

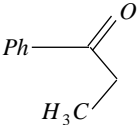
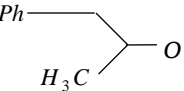
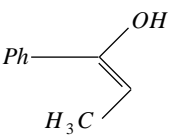
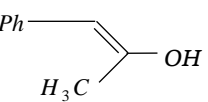
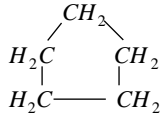


10. Which one of the following on ozonolysis followed by oxidation will give adipic acid [AMU 2002]



11. Which of the following structures correspond to the product expected, when excess of  $C_6H_6$  reacts with  $CH_2Cl_2$  in presence of anhydrous  $AlCl_3$  [CBSE PMT 1980]

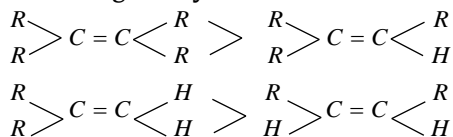


- (c)  $\begin{array}{c} \text{Cl} \\ | \\ \text{C} \\ | \\ \text{Cl} \end{array}$  (d)  $\text{CH}_2$
12. Which of the following will be easily nitrated [DCE 2001]
- (a)  (b) 
- (c)  $\text{CH}_3\text{NO}_2$  (d)  $\text{C}_6\text{H}_5\text{NO}_2$
13. Chlorination of benzene is not possible in the following reaction [UPSEAT 2004]
- (a)  $\text{C}_6\text{H}_6 + \text{Cl}_2 \xrightarrow{\text{FeCl}_3}$   
 (b)  $\text{C}_6\text{H}_6 + \text{HOCl} \xrightarrow{\text{H}^+}$   
 (c)  $\text{C}_6\text{H}_6 + \text{I}-\text{Cl} \xrightarrow{\text{ZnCl}_2}$   
 (d)  $\text{C}_6\text{H}_6 + \text{Cl}_2 \xrightarrow{\text{AlCl}_3}$
14.  $\text{Ph}-\text{C}\equiv\text{C}-\text{CH}_3 \xrightarrow{\text{Hg}^{2+}/\text{H}^+} \text{A}$ . A is [IIT-JEE Screening 2002]
- (a)  (b) 
- (c)  (d) 
15. In order to complete the reaction  
 1-Pentyne  $\xrightarrow{\text{a}}$  4-Octyne  $\xrightarrow{\text{b}}$  cis 4-Octene a and b will be
- (1)  $\text{NaNH}_2; \text{CH}_3\text{CH}_2\text{Br}$  :  $\text{H}_2$ , (one mole) Pd or Ni  
 (2)  $\text{NaNH}_2; \text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$  :  $\text{H}_2$  (two moles) Pd or Ni  
 (3)  $\text{NaNH}_2; \text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$  :  $\text{H}_2$ , (one mole) Pd or Ni  
 (4)  $\text{NaNH}_2; \text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$  :  $\text{BH}_3, \text{H}_2\text{O}_2, \text{OH}^-$  [MP PET 1994]
- (a) 1 (b) 2
- (c) 3 (d) 4
16. The number of secondary hydrogens in 2, 2-dimethyl butane is [UPSEAT 2004]
- (a) 8 (b) 6  
 (c) 4 (d) 2
17. An alkane (molecular weight 72) forms only one monochlorinated product. Its formula is [BHU 1981]
- (a)  $(\text{CH}_3)_4\text{C}$   
 (b)  $\text{CH}_3(\text{CH}_2)_3\text{CH}_3$   
 (c)  $(\text{CH}_3)_2\text{CHCH}_2\text{CH}_3$   
 (d) 
18. The poisonous gas that comes out with petrol burning in a car is [CPMT 1997]
- (a)  $\text{CH}_4$  (b)  $\text{C}_2\text{H}_6$   
 (c)  $\text{CO}_2$  (d)  $\text{CO}$
19. The reagent X in the reactions  
 $(\text{CH}_3)_3\text{CCH}=\text{CH}_2 \xrightarrow[\text{THF}]{\text{X}} \text{Y} \xrightarrow[\text{NaOH}]{\text{NaBH}_4} (\text{CH}_3)_3\text{C}-\underset{\text{OH}}{\text{CH}}-\text{CH}_3$
- (a)  $\text{H}_3\text{O}^+$   
 (b)  $\text{Hg}(\text{CH}_3\text{COO})_2$   
 (c)  $\text{OH}^-$   
 (d)  $\text{HCOOH}$
20.  $\text{CH}_2=\text{CH}_2 \xrightarrow{\text{Br}_2/\text{H}_2\text{O}} \text{A}$ ,  
 In the above reaction the compound A is [DPMT 2004]
- (a) Ethylene bromohydrin  
 (b) 1, 2-dibromo ethane  
 (c) Ethanol  
 (d) None of these

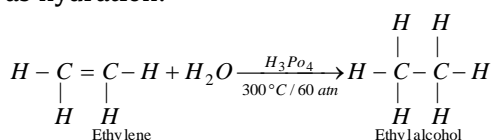
# AS Answers and Solutions

(SET -24)

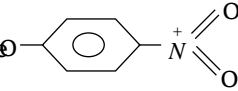
1. (a) According to saytzeff rule order of stability is



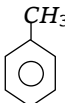
2. (c) On cracking petrol gives smaller hydrocarbons like  $CH_4$ ,  $C_3H_6$ .
3. (a) Cetane is chemically hexadecane i.e.,  $CH_3(CH_2)_{14}CH_3$ .
4. (c) In arenes electrophilic substitution reaction takes place and it does not give electrophilic addition reactions. We also know that benzene is a resonance hybrid of two structures and greater stability of benzene is due to delocalization of  $\pi$  electron.
5. (c)  $AlCl_3$  is an electron deficient compound. Hence, act as an electrophile.
6. (a) Alkenes react with water in the presence of acid and form alcohols. This reaction is called as hydration.





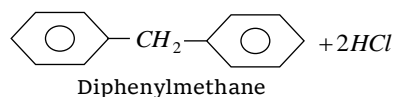
7. (a)  $C_6H_5CH_3 \xrightarrow{[O]} C_6H_5COOH \xrightarrow{NaOH} C_6H_5COONa \xrightarrow{NaOH / CaO} C_6H_6$
8. (b) Halogenation of alkyl group proceeds via free radical mechanism.

9. (c) The structure  is most unlikely

as N containing 5 valence electrons should not carry positive charge.

10. (b)   $\xrightarrow{O_3} OHC-(CH_2)_3-CH-CHO \xrightarrow{[O]} HOOC-(CH_2)_3-CH-COOH$
- Substituted adipic acid

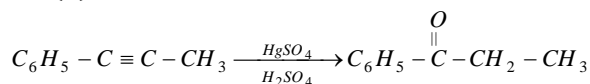
11. (d)  +  $CH_2Cl_2$  +   $\xrightarrow{\text{Anhydrous } AlCl_3}$



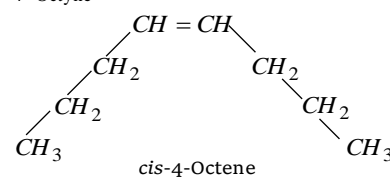
12. (a) The presence of an electron-releasing group (+I group) e.g.,  $-CH_3$ ,  $-OH$ ,  $-NH_2$  etc makes the process of nitration easier. So  $C_6H_5CH_3$  will be easily nitrated.
13. (b) Reaction is called Gattermann-Koch synthesis, which is carried by catalyst  $AlCl_3$ .

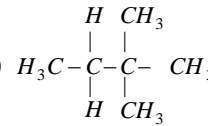
14.

(a)



15. (c)  $CH_3-CH_2-CH_2-C \equiv CH \xrightarrow{NaNH_2} CH_3-CH_2-CH_2-C \equiv C-Na \xrightarrow{CH_3CH_2CH_2Br} CH_3-CH_2-CH_2-C \equiv C-CH_2-CH_2-CH_3 \xrightarrow{H_2, Pd} 4\text{-Octyne}$



16. (d) 
- 2,2 dimethyl butane

17. (a) The alkane forms only one mono substituted product, it must have only one type of hydrogen atoms. therefore the alkane is 2, 2-dimethyl propane.
18. (d) On petrol burning CO comes out which is so much poisonous gas.
19. (b) Oxymercuration-demercuration : with mercuric acetate (in THF) followed by reduction with  $NaBH_4 / NaOH$  is an example of hydration of alkene according to Markovnikov's rule.

