Ochem Practice Test

Name

1. Which hydrocarbon is saturated?
(A) propene (B) ethyne (C) butene (D) heptane

2. Which compound is classified as a hydrocarbon?
(A) ethane (B) ethanol (C) chloroethane (D) ethanoic acid

3. Which formula represents a molecule of a saturated hydrocarbon?
(A) C_2H_2
(B) C_4H_{10}
(C) C_5H_8
(D) C_6H_6

4. What is the general formula for the members of the alkane series?
(A) CnH_{2n}
(B) CnH_{2n+2}
(C) CnH_{2n-2}
(D) CnH_{2n-6}

5. In which group could the hydrocarbons all belong to the same alkene series?
(A) C_2H_2, C_2H_4, C_2H_6
(B) C_2H_2, C_2H_4, C_4H_8
(C) C_2H_4, C_2H_6, C_3H_6
(D) C_2H_4, C_3H_6, C_4H_8

6. Molecules of 2-methyl-propane and *n*-butane differ in their
(A) structural formulas (C) number of carbon atoms
(B) molecular formulas (D) number of covalent bonds

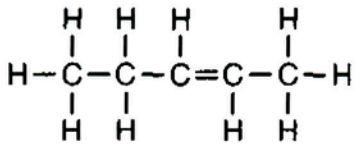
7. Which of the following compounds has the greatest possible number of isomers?
(A) butane (B) ethane (C) pentane (D) propane

8. Which alkane has isomers?
(A) methane (B) ethane (C) propane (D) butane

9. Molecules of 2-methyl-propane and *n*-butane differ in their
(A) structural formulas (C) number of carbon atoms
(B) molecular formulas (D) number of covalent bonds

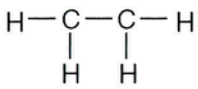
10. Which compound has the molecular formula C_5H_{12}?
(A) butane (C) 2,2-dimethyl butane
(B) pentane (D) 2,2-dimethyl pentane

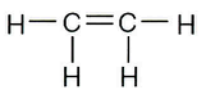
11. What is the IUPAC name of the compound with the structural formula shown below?

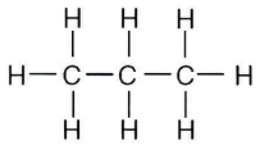


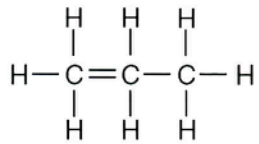
(A) 2-pentene (B) 3-pentene (C) 2-pentyne (D) 3-pentyne

12. The empirical formula of a compound is CH_2. Which molecular formula is correctly paired with a structural formula for this compound?

(A) C_2H_4 

(B) C_2H_4 

(C) C_3H_8 

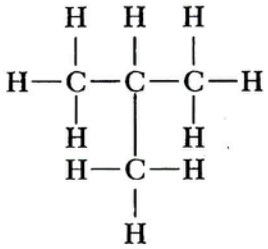
(D) C_3H_8 

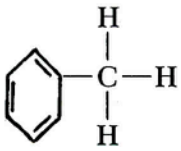
13. A molecular formula for an alkene is
(A) C_2H_6
(B) C_2H_4
(C) C_2H_5COOH
(D) $C_6H_{12}O_6$

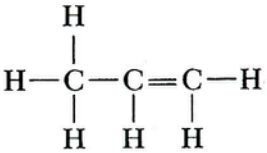
14. Which formula represents a hydrocarbon with a double covalent bond?
(A) CH_3Cl
(B) C_2H_3Cl
(C) C_4H_8
(D) C_4H_{10}

15. Which compound belongs to the hydrocarbon series with the general formula C_nH_{2n}?

(A)

(B) 

(C) 

(D) 

16. For simplicity, the structure of benzene is often represented as

(A)

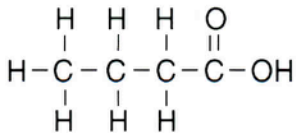
(B)

(C)

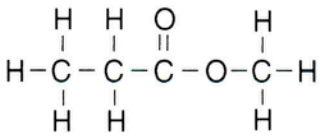
(D)

17. Toluene is a member of the same homologous series as
(A) acetylene (B) ethene (C) benzene (D) butene

18. Given the structural formulas for two organic compounds:

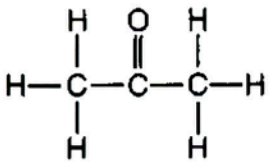


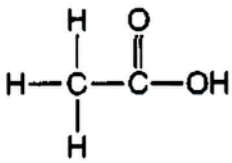
and

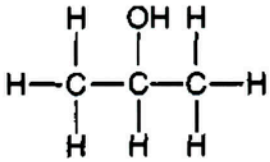


The differences in their physical and chemical properties are primarily due to their different
(A) number of carbon atoms
(B) number of hydrogen atoms
(C) molecular masses
(D) functional groups

19. Given the three organic structural formulas shown below:

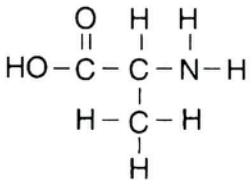






Which organic compound classes are represented by these structural formulas, as shown from left to right?
(A) ester, organic acid, ketone
(B) ester, aldehyde, organic acid
(C) ketone, aldehyde, alcohol
(D) ketone, organic acid, alcohol

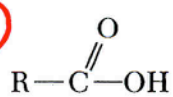
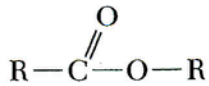
20. The molecule below belongs to which class of compounds?



(A) alcohol (B) ester (C) aldehyde (D) amino acid

21. Which of these compounds has chemical properties most similar to the chemical properties of ethanoic acid?
(A) C_3H_7COOH
(B) C_2H_5OH
(C) $C_2H_5COOC_2H_5$
(D) $C_2H_5OC_2H_5$

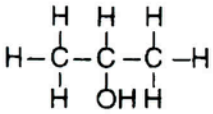
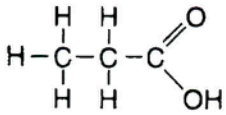
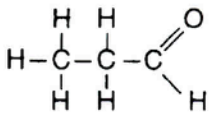
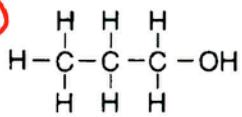
22. Which is the general formula for an organic acid?

(A) R—OH (B) R—O—R (C)  (D) 

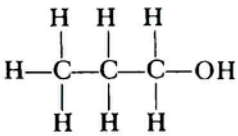
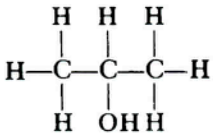
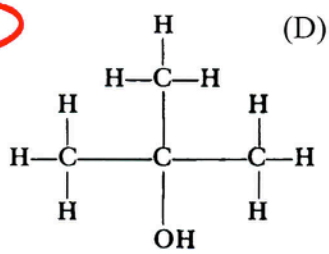
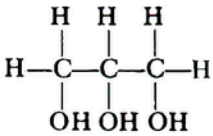
23. An example of a secondary alcohol is

(A) 1-propanol (B) 2-propanol (C) 1,2-propanediol (D) 1,2,3-propanetriol

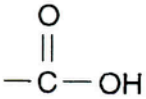
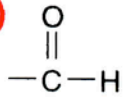
24. Which compound is a primary alcohol?

(A)  (B)  (C)  (D) 

25. Which is a tertiary alcohol?

(A)  (B)  (C)  (D) 

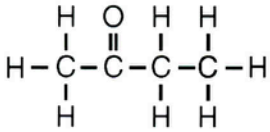
26. Which functional group, when attached to a chain of carbon atoms, will produce an organic molecule with the characteristic properties of an aldehyde?

(A)  (B)  (C) (D) —OH

27. Which is the common name for the organic compound whose IUPAC name is methanal?

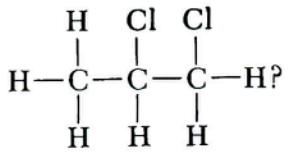
(A) formaldehyde (B) acetaldehyde (C) formic acid (D) acetic acid

28. What is the IUPAC name of the compound with the following structural formula?



(A) propanone (B) propanal (C) butanone (D) butanal

29. What is the correct IUPAC name for



(A) 1,2-dichlorobutane (B) 2,3-dichlorobutane (C) 1,2-dichloropropane (D) 2,3-dichloropropane

30. The compound CH_3COOCH_3 is classified as
(A) an acid (B) an ester (C) a hydrocarbon (D) an alcohol

31. Which equation shows conservation of charge?
(A) $Fe \rightarrow Fe^{2+} + e^-$
(B) $Fe + 2e^- \rightarrow Fe^{2+}$
(C) $Fe \rightarrow Fe^{2+} + 2e^-$
(D) $Fe + 2e^- \rightarrow Fe^{3+}$

32. An alcohol and an organic acid are combined to form water and a compound with a pleasant odor. This reaction is an example of
(A) saponification (B) esterification (C) polymerization (D) fermentation

Answer Key

1. D
2. A
3. B
4. B
5. D
6. A
7. C
8. D
9. A
10. B
11. A
12. B
13. B
14. C
15. D
16. D
17. C
18. D
19. D
20. D
21. A
22. C
23. B
24. D
25. C
26. B
27. A
28. C
29. C
30. B
31. C
32. B