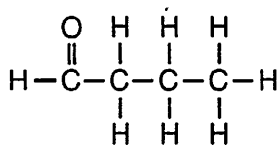


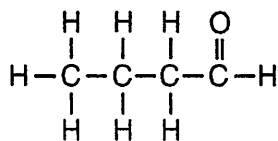
- Which compound is a saturated hydrocarbon?
 - propyne
 - propene
 - propanal
 - propane
- Which compound is a member of the same homologous series as C_3H_8 ?
 - C_4H_8
 - C_5H_{10}
 - C_5H_8
 - CH_4
- A molecule of an unsaturated hydrocarbon must have
 - at least one multiple carbon-carbon bond
 - at least one single carbon-carbon bond
 - two or more multiple carbon-carbon bonds
 - two or more single carbon-carbon bonds
- Which formula represents an unsaturated hydrocarbon?
 - C_7H_{16}
 - C_5H_{12}
 - C_8H_{14}
 - C_6H_{14}
- A carbon-carbon triple bond is found in a molecule of
 - butane
 - butene
 - butyne
 - butanone
- Which compound is an alkyne?
 - C_4H_8
 - C_2H_4
 - C_2H_2
 - C_4H_{10}
- Which atoms can bond with each other to form chains, rings, or networks?
 - hydrogen atoms
 - carbon atoms
 - oxygen atoms
 - nitrogen atoms
- Which element is present in all organic compounds?
 - carbon
 - oxygen
 - hydrogen
 - nitrogen
- Butanal and butanone have different chemical and physical properties primarily because of differences in their
 - molecular formulas
 - molecular masses
 - functional groups
 - number of carbon atoms per molecule
- Which two compounds have the same molecular formula but different chemical and physical properties?
 - CH_3CH_2Cl and CH_3CH_2Br
 - CH_3CHCH_2 and $CH_3CH_2CH_3$
 - CH_3CHO and CH_3COCH_3
 - CH_3CH_2OH and CH_3OCH_3
- The compounds 2-butanol and 2-butene both contain
 - oxygen atoms
 - single bonds, only
 - double bonds, only
 - carbon atoms
- Atoms of which element can bond with each other to form ring and chain structures in compounds?
 - Ca
 - Na
 - H
 - C
- What is the total number of carbon atoms in a molecule of ethanoic acid?
 - 1
 - 2
 - 3
 - 4

14. Given a formula representing a compound:

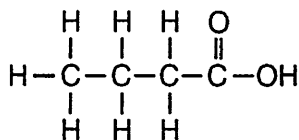


Which formula represents an isomer of this compound?

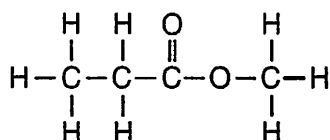
1)



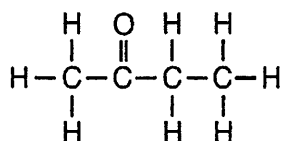
2)



3)



4)



15. The two isomers of butane have different

- 1) formula masses
- 2) structural formulas
- 3) molecular formulas
- 4) empirical formulas

16. The organic compound represented by the condensed structural formula $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO}$ is classified as an
- 1) ether
 - 2) ester
 - 3) aldehyde
 - 4) alcohol

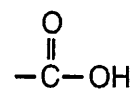
17. The isomers butane and methylpropane differ in their

- 1) structural formulas
- 2) molecular formulas
- 3) total number of atoms per molecule
- 4) total number of bonds per molecule

18. Which two compounds are isomers of each other?

- 1) $\text{CH}_3\text{CHOHCH}_3$ and $\text{CH}_3\text{CHOHCH}_2\text{OH}$
- 2) $\text{CH}_3\text{CH}_2\text{CHO}$ and CH_3COCH_3
- 3) $\text{CH}_3\text{CH}_2\text{COOH}$ and $\text{CH}_3\text{COOCH}_2\text{CH}_3$
- 4) $\text{CH}_3\text{CHBrCH}_3$ and $\text{CH}_2\text{BrCHBrCH}_3$

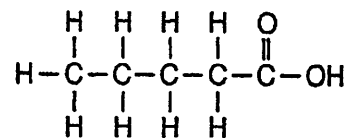
19. Given a formula of a functional group:



An organic compound that has this functional group is classified as

- 1) an ester
- 2) a ketone
- 3) an aldehyde
- 4) an acid

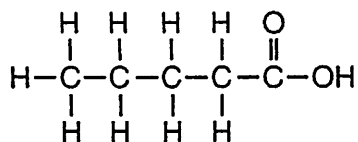
20. Given the formula for an organic compound:



This compound is classified as an

- 1) ester
- 2) organic acid
- 3) amine
- 4) aldehyde

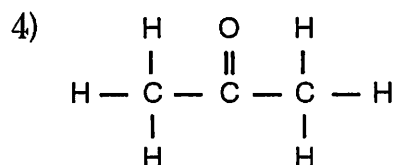
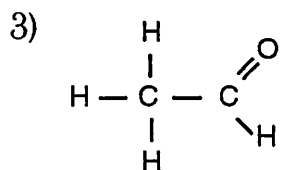
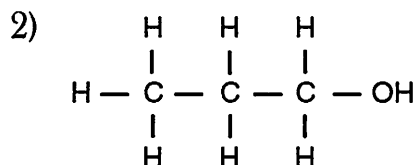
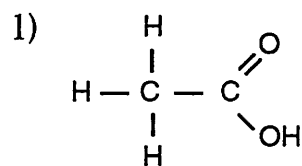
21. Given the structural formula:



What is the IUPAC name of this compound?

- 1) pentanol
- 2) pentanal
- 3) pentanoic acid
- 4) methyl pentanoate

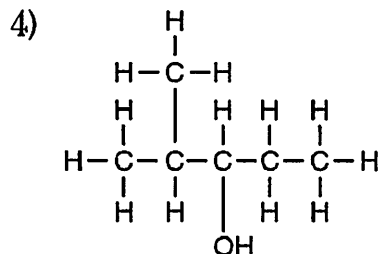
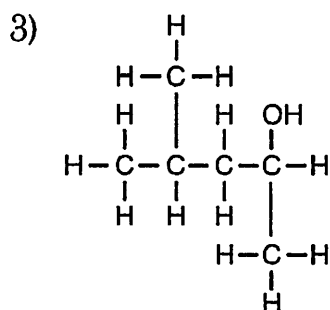
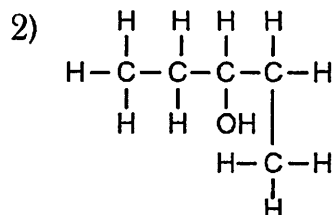
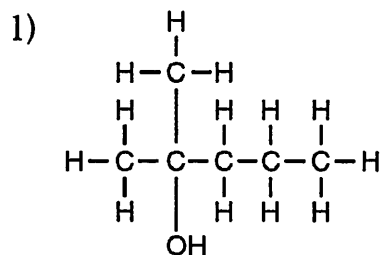
22. Which structural formula represents an alcohol?



23. Which formula represents a ketone?

- 1) CH
- 2) HCHO
- 3) HCOOH
- 4) CH_3COCH_3

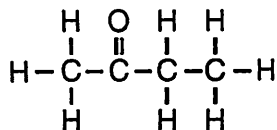
24. Which structural formula is correct for 2-methyl-3-pentanol?



25. What is the total number of pairs of electrons shared between the carbon atom and the oxygen atom in a molecule of methanal?

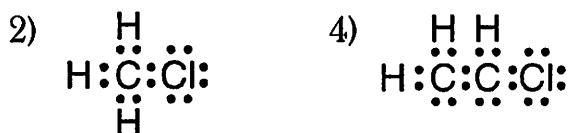
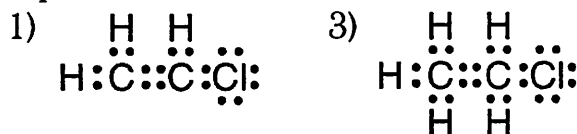
- 1) 3
- 2) 1
- 3) 2
- 4) 4

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

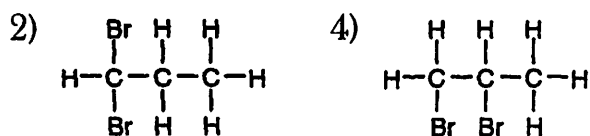
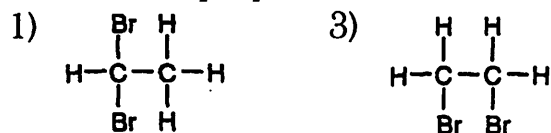


- 1) butanone 3) butanal
 2) propanal 4) propanone

27. Which Lewis electron-dot diagram represents chloroethene?



28. Which structural formula represents 1,1-dibromopropane?



29. The reaction between an organic acid and an alcohol produces

- 1) an ether 3) an aldehyde
 2) an ester 4) a ketone

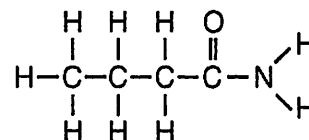
30. The compound $\text{CH}_3\text{COOCH}_3$ is classified as

- 1) an acid 3) an alcohol
 2) an ester 4) a hydrocarbon

31. Which class of organic compounds has molecules that contain nitrogen atoms?

- 1) alcohol 3) ether
 2) amine 4) ketone

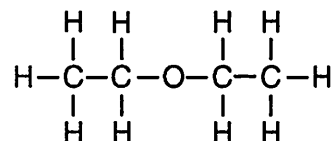
32. Given the formula:



This compound is classified as

- 1) an amine 3) an amide
 2) an aldehyde 4) a ketone

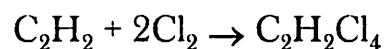
33. Given the structural formula:



The compound represented by this formula can be classified as an

- 1) ester 3) aldehyde
 2) ether 4) organic acid

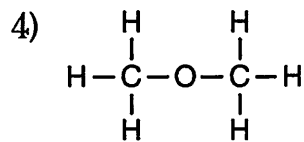
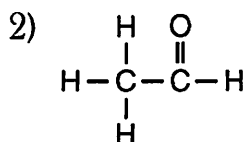
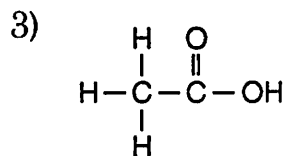
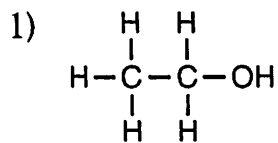
34. Given the balanced equation for an organic reaction:



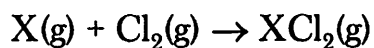
This reaction is best classified as

- 1) esterification 3) substitution
 2) addition 4) fermentation

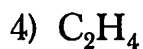
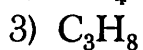
35. Which structural formula represents an ether?



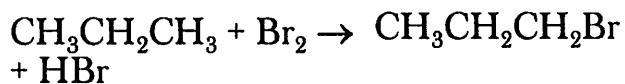
36. Given the incomplete equation representing an organic addition reaction:



Which compound could be represented by X?



37. Given the balanced equation representing a reaction:



This organic reaction is best classified as

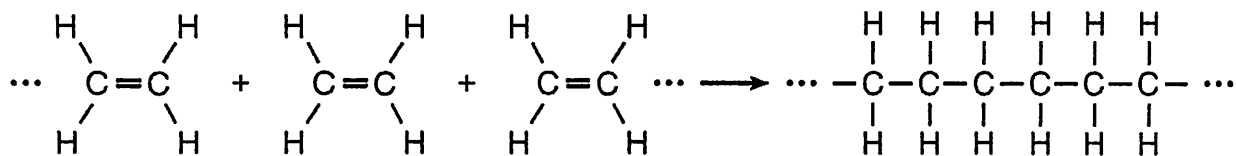
1) a substitution reaction

2) an addition reaction

3) a polymerization reaction

4) an esterification reaction

38. Given the equation:



Which type of reaction is represented by this equation?

- 1) esterification 2) combustion 3) substitution 4) polymerization
-

39. What are the two main products of a fermentation reaction?

- 1) ethanol and carbon dioxide
2) ethanol and water
3) sugar and carbon dioxide
4) sugar and water

40. When butane burns in an excess of oxygen, the principal products are

- 1) CO_2 and H_2O 3) CO_2 and H_2
2) CO and H_2O 4) CO and H_2

41. Which reaction results in the production of soap?

- 1) esterification 3) polymerization
2) saponification 4) fermentation

42. When hydrocarbons burn completely in an excess of oxygen, the products are

- 1) carbon dioxide and carbon
2) carbon monoxide and water
3) carbon monoxide and carbon dioxide
4) carbon dioxide and water

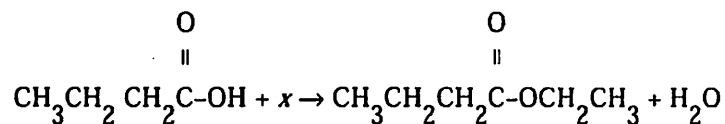
43. Given the reaction:



This reaction is an example of

- 1) esterification 2) saponification 3) fermentation 4) hydrogenation
-

44. Given the incomplete reaction:

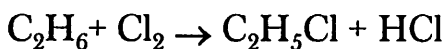


Which compound is represented by x ?

- 1) $\text{CH}_3\text{CH}_2\text{OH}$ 3) $\text{CH}_3\text{C}-\text{H}$

- 2) $\text{CH}_3\overset{\text{O}}{\parallel}\text{OCH}_2\text{CH}_3$ 4) $\text{CH}_3\overset{\text{O}}{\parallel}\text{CCH}_3$

45. Given the equation:

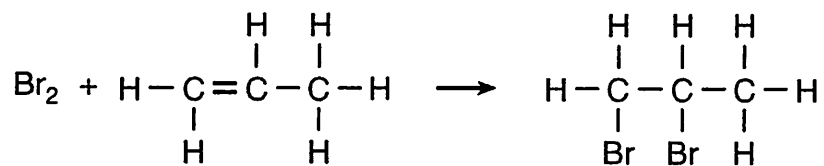


This reaction is best described as

- 1) addition involving a saturated hydrocarbon
 - 2) substitution involving an unsaturated hydrocarbon
 - 3) substitution involving a saturated hydrocarbon
 - 4) addition involving an unsaturated hydrocarbon
-

Base your answers to questions 46 and 47 on the information below.

A reaction between bromine and a hydrocarbon is represented by the balanced equation below.

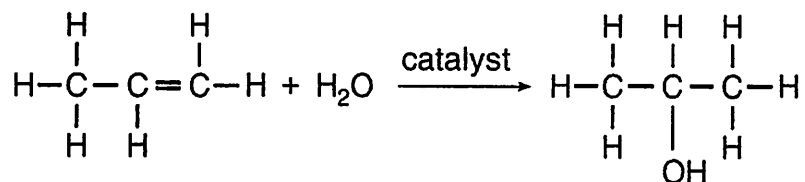


46. Write the name of the homologous series to which the hydrocarbon belongs.

47. Identify the type of organic reaction.

Base your answers to questions 48 through 50 on the information below.

In one industrial organic reaction, C_3H_6 reacts with water in the presence of a catalyst. This reaction is represented by the balanced equation below.



48. Identify the class of compound to which the product of the reaction belongs.

49. Write the IUPAC name for the organic reactant.

50. Explain, in terms of bonding, why C_3H_6 is classified as an unsaturated hydrocarbon.