

These questions are multiple-choice questions that ask you to select only **one** answer choice from a list of four choices. Each correct answer gives you one point.

### CHEMISTRY

31. The incomplete combustion reaction of propane is:

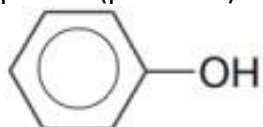
- A.  $\text{C}_3\text{H}_8 + 5 \text{O}_2 \rightarrow 3 \text{CO}_2 + 4 \text{H}_2\text{O} + \text{energy}$
- B.  $\text{C}_6\text{H}_{12} + 9 \text{O}_2 \rightarrow 6 \text{CO}_2 + 6 \text{H}_2\text{O} + \text{energy}$
- C.  $\text{C}_3\text{H}_8 + \frac{7}{2} \text{O}_2 \rightarrow 3 \text{CO} + 4 \text{H}_2\text{O} + \text{energy}$
- D.  $\text{C}_3\text{H}_4 + \text{O}_2 \rightarrow 3 \text{C} + 2 \text{H}_2\text{O} + \text{energy}$

32. Reaction of phenol with excess bromine in the presence of catalyst yields:

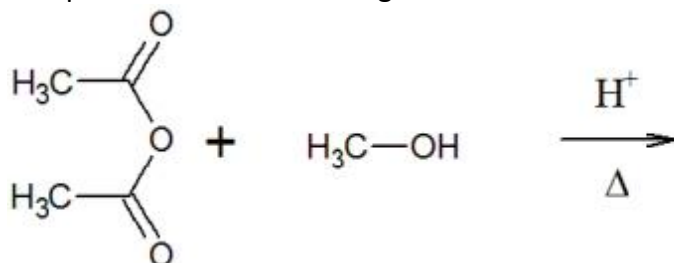
- A. 2,4,6-tribromophenol
- B. 2-bromophenol
- C. 2,4-dibromophenol
- D. 3-bromophenol

33. Which of the following acids will be almost completely deprotonated by NaOH?

- A. ethanol  $\text{CH}_3\text{-CH}_2\text{-OH}$  ( $\text{pK}_a = 16.0$ )
- B. water  $\text{H-O-H}$  ( $\text{pK}_a = 15.7$ )
- C. both ethanol and water
- D. phenol ( $\text{pK}_a = 9.9$ )

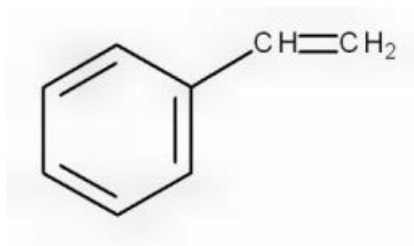


34. The products of the following reaction are:



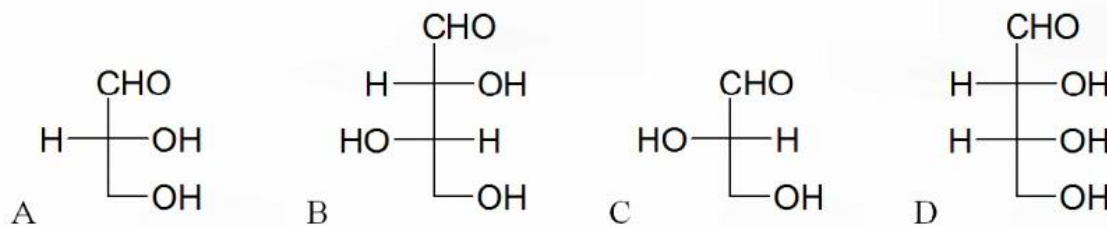
- A. ethyl ethanoate and ethanoic acid
- B. methyl ethanoate and methanoic acid
- C. methyl ethanoate and ethanoic acid
- D. ethyl ethanoate and methanoic acid

35. What is produced when the following molecule is polymerized?



- A. teflon  
B. polyvinyl chloride  
C. polystyrene  
D. saran
36. The process that is used to convert unsaturated vegetable oils, which are liquids at room temperature, to saturated fats, which are solids at room temperature:
- I. is called hydrogenation reaction  
II. needs catalyst (Pt, Ni, or some other metal)  
III. yields a structure called micelle  
IV. involves digestive enzymes called lipases
- A. I and II  
B. I and IV  
C. II and IV  
D. II and III
37. When \_\_\_\_\_ reacts with NaOH, the product is sodium benzoate.
- A. benzoic acid  
B. benzene  
C. benzaldehyde  
D. benzoic hydroxide
38. Which type of bonding is mostly responsible for stabilization of the primary structure of proteins?
- A. Disulfide bridges between cysteine residues.  
B. Hydrogen bonding between the C=O and N-H groups of peptide bonds.  
C. Peptide bonds between amino acids.  
D. Hydrophobic bonds between side chains of nonpolar amino acids.
39. For monosaccharides, the ring forms (pyranose or furanose) are:
- A. acetals  
B. carbonyls  
C. hemiacetals  
D. esters

40. Which of the following compounds can form the racemate?



- A. A and B
- B. A and C
- C. B and D
- D. C and D