CHEMISTRY SAMPLE TEST 3.

1. Elements in the Periodic Table are arranged according to their
   A: atomic mass.
   B: number of neutrons.
   C: mass number.
   D: atomic number.
   E: chemical properties.

2. How many protons, neutrons and electrons are in the ion below?

$$^{39}_{19}K^{+}$$

   A: 20 protons, 19 neutrons, 19 electrons
   B: 19 protons, 20 neutrons, 18 electrons
   C: 39 protons, 19 neutrons, 38 electrons
   D: 20 protons, 19 neutrons, 20 electrons
   E: 40 protons, 20 neutrons, 19 electrons

3. All of the following molecules are polar except:

   A: CO_2 B: H_2S C: CH_3OH D: H_2O E: NH_3

4. Benzene, C_6H_6, is a common solvent. Select the substances that are well soluble in benzene.
   1. NaI 2. I_2 3. margarine 4. table salt

   A: 1,2,3,4 B: 2,3,4 C: 1,4 D: 1,2 E: 2,3

5. The vapor pressure of a liquid is **low** at room temperature. The liquid
   A: has low melting point.
   B: has low surface tension.
   C: exhibits weak intermolecular forces.
   D: has high boiling point.
   E: is volatile.

6. The dissolution of an ionic solid in water is **endothermic**. You have a saturated solution, which of the following changes will cause more solid to dissolve?
   A: Increase the temperature.
   B: Increase the pressure.
   C: Decrease the temperature.
   D: Decrease the pressure.
   E: Add more solid.

7. 0.2 g of hydrogen fluoride (HF) is:
   Molar masses: H=1.0 g/mol ; F=19 g/mol

   A: 6×10^{21} mole B: 100 mole C: 20 mole D: 0.02 mole E: 0.01 mole

8. 0.08 g NaOH is dissolved in enough water to make 10 mL of solution. Calculate the **molarity** of the solution.
Molar masses: Na=23 g/mol ; O=16 g/mol ; H=1.0 g/mol

A: 0.2 M B: 0.2 mM C: 20 mM D: 5 M E: 5 mM

9. The pH of an acid solution is 3. It may be all of the following solutions **except**.
A: 10^{-3} M HCl solution.
B: 10^{-3} M CH_3COOH solution.
C: 10^{-3} M HNO_3 solution.
D: 10^{-3} M HBr solution.
E: 10^{-3} M $HClO_4$ solution.

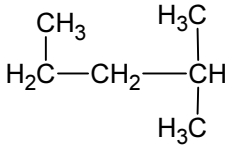
10. A 0.01 M HCl solution is diluted with water hundred times.
1. The pH of the solution increases by 2.
2. The pOH of the solution increases by 2.
3. The hydronium ion concentration of the solution decreases from 10^{-2} M to 10^{-4} M.
4. The hydroxide ion concentration of the solution does not change.

A: 1,2 B: 2,3 C: 1,3 D: 1,3,4 E: 2,3,4

11. Choose the redox reaction.
A: $HNO_3 + KOH \rightarrow KNO_3 + H_2O$
B: $2HNO_3 + Na_2CO_3 \rightarrow 2NaNO_3 + H_2O + CO_2$
C: $Ba(NO_3)_2 + Na_2SO_4 \rightarrow BaSO_4 + 2NaNO_3$
D: $2HNO_3 + Ca(OH)_2 \rightarrow Ca(NO_3)_2 + 2H_2O$
E: $2HNO_3 + 3H_2S \rightarrow 2NO + 3S + 4H_2O$

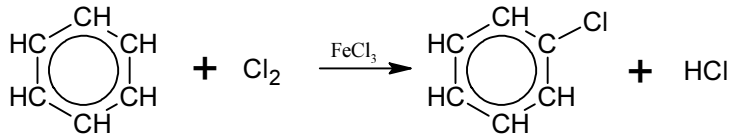
12. Unstable nuclei undergo radioactive decay. During **alpha** radiation
A: the atomic number decreases by 2 and the mass number by 4.
B: the atomic number decreases by 4 and the mass number by 2.
C: the atomic number increases by 1 and the mass number doesn't change.
D: the loss of a neutron decreases the mass number by 1 and the charge by 1.
E: the loss of a proton decreases the mass number by 1 and increases the charge by 1.

13. The IUPAC name of the following compound is:



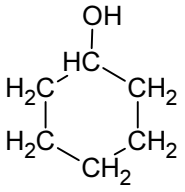
A: 2,2,4-trimethyl-propane
B: 2,2-dimethylbutane
C: 1-isopropylpropane
D: 2-methylpentane
E: 2-methylpentene

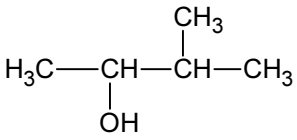
14. The reaction below is classified as

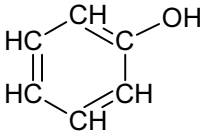


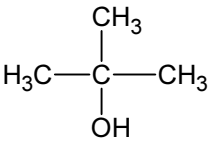
A: a substitution reaction.
B: an addition reaction.
C: an elimination reaction.
D: a saturation reaction.
E: a condensation reaction.

15. Choose the compound(s) that are secondary alcohols

1) 

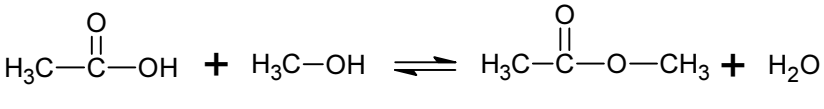
2) 

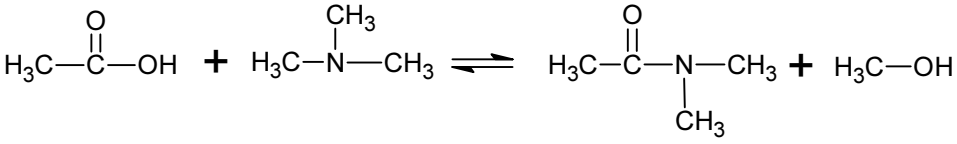
3) 

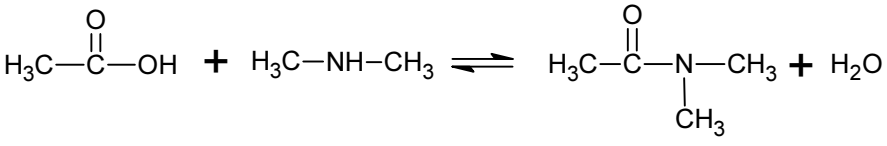
4) 

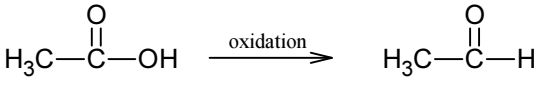
A: 1,2,3,4 B: 1,3 C: 1,4 D: 1,2 E: 2,3

16. Acetic acid gives which of the following reactions?

1. 

2. 

3. 

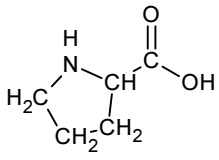
4. 

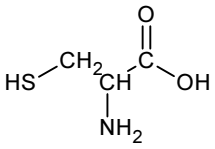
A: 1,2 B: 1,3 C: 2,3 D: 1,4 E: 2,4

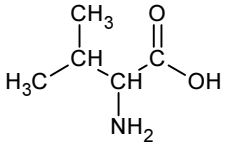
17. How many stereoisomers does an aldopentose have in its open chain form?

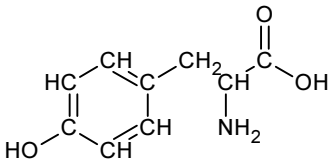
A: 2 B: 3 C: 4 D: 6 E: 8

18. Which of the following amino acids have nonpolar side chains?

1. 

2. 

3. 

4. 

A: 2,3 B: 1,2 C: 3,4 D: 1,3 E: 1,2,3

19. Which of the following functional groups can be found in proteins?

1. amide 2. phosphodiester 3. disulfide 4. alkyne

A: 1,2 B: 2,3 C: 1,3 D: 3,4 E: 1

20. Which of the following substances classify as lipids?

1. tryacyl glycerols 2. nucleosides 3. steroids 4. waxes

A: 1 B: 1,3 C: 1,3,4 D: 2,3 E: 1,2,3,4