

Test # 5

Name _____

Directions: Each question has only one correct answer. Mark with X one of the lettered choices.

1. Which of the following statements is false regarding sub-atomic particles?
 - A) the proton has a positive one charge
 - B) the neutron has no charge.
 - C) the electrons have a greater mass than the protons
 - D) protons and neutrons are the nucleons of the atom.

2. A neutral atom, atomic number 33 and atomic mass 75, contains:
 - A) 75 neutrons
 - B) 42 electrons
 - C) 33 protons
 - D) 75 electrons

3. Which kind of bonding can be found in a sample of H₂O?
 - A) hydrogen bonds only
 - B) nonpolar covalent bonds only
 - C) ionic and nonpolar hydrogen bonds
 - D) both polar covalent and hydrogen bonds

4. The SiCl₄ molecule is nonpolar and chlorine is more electronegative than silicon. From this information alone it can be deduced that the:
 - A) Si-Cl bond is nonpolar
 - B) SiCl₄ molecule is linear
 - C) SiCl₄ molecule is planar
 - D) SiCl₄ molecule is symmetrical

5. If the reaction $\text{N}_2 + 3 \text{H}_2 \longrightarrow 2\text{NH}_3$ takes place inside a sealed reaction chamber, then which of these procedures will cause a decrease in the rate of reaction?
 - A) raising the temperature of the reaction chamber
 - B) increasing the volume inside the reaction chamber
 - C) removing the NH₃ as it is formed
 - D) adding more N₂ to the reaction chamber

6. Which action will drive the reaction $4 \text{HCl}(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2 \text{H}_2\text{O}(\text{l}) + 2 \text{Cl}_2(\text{g})$ to the right?
 - A) heating the equilibrium mixture
 - B) adding water to the system
 - C) decreasing the oxygen concentration
 - D) increasing the system's pressure

7. A solution of salt in 100 g of water that still dissolve more solute at a given temperature is classified as:

- A) unsaturated B) supersaturated C) dilute D) saturated

8. Which is true about a solution that is acidic?

- A) $[H^+]$ equals zero B) $[OH^-]$ equals $[H^+]$
C) $[H^+]$ is less than $[OH^-]$ D) $[H^+]$ is greater than $[OH^-]$

9. Which of the following solutions of equal concentration will have a 2-fold higher osmotic pressure than that of a sucrose solution of the same concentration?

- A) KCl B) K_2SO_4 C) $AlCl_3$ D) K_3PO_4

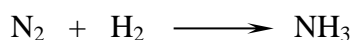
10. Which of the reactions below represents an oxidation-reduction reaction?

- A) $Zn + 2 HCl \longrightarrow ZnCl_2 + H_2$
B) $ZnCl_2 + 2 NaOH \longrightarrow Zn(OH)_2 + 2 NaCl$
C) $ZnCl_2 \longrightarrow Zn^{2+} + 2 Cl^-$
D) $Zn(OH)_2 + 2 HCl \longrightarrow ZnCl_2 + H_2O$

11. Of the compounds below, in which one does iron have the lowest oxidation number?

- A) Fe B) $FeCl_3$ C) $FeSO_4$ D) $Fe(CH_3COO)_2$

12. According to the reaction represented by the unbalanced equation below, how many moles of $H_2(g)$ are required to react completely with 1 mole of $N_2(g)$?



- A) 0.5 mol B) 1 mol C) 2 mol D) 3 mol

13. If the pH value of a salt solution is 7, most likely this is a solution of:

- A) Na_2CO_3 B) KCl C) KCN D) NH_4Cl

14. Which of these is a base according to Lewis theory for acid and bases?

- A) NH_3 B) NaOH C) $Ca(OH)_2$ D) $Zn(OH)_2$

15. Which substance is used in electrical wiring?

- A) iron B) copper C) aluminum D) nickel

16. Which compound is a member of the alkene series?

- A) benzene B) acetylene C) toluene D) ethene

17. Which of the following is not an isomer of the other three compounds?

- A) 3-ethyl-3-methyl-1-hexen B) 2,5-dimethyl-3-hexene
C) 4-octene D) 4-ethyl-1-hexene

18. Ethene is used to make ethanol. Which of these reactions is used to make ethanol from ethene?

- A) catalytic hydration B) fermentation
C) oxidation using oxygen D) reduction using hydrogen

19. Which compound is most likely to react by addition?

- A) CH_4 B) C_3H_6 C) C_4H_{10} D) C_5H_{12}

20. The compound 2-propanol is classified as a:

- A) primary alcohol B) secondary alcohol C) tertiary alcohol D) diol

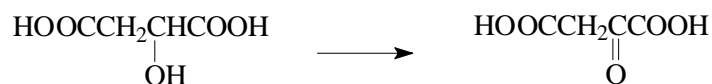
21. Which statement is false?

- A) $\text{CH}_3\text{CH}_2\text{NH}_2$ is ethylamine
B) C_5H_{10} is the molecular formula of cyclopentane and 2-pentene
C) $\text{CH}_3\text{CHBrCHBrCH}_3$ is 2,3-dibromobutane
D) $\text{CH}_3\text{CH}_2\text{OH}$ is an ether

22. Oxidation of aldehydes produces:

- A) ketones B) diols C) alcohols D) carboxylic acids

23. The enzyme-catalyzed transformation below, which occurs in the Krebs cycle, is best described as belonging to which of the following categories of reactions?

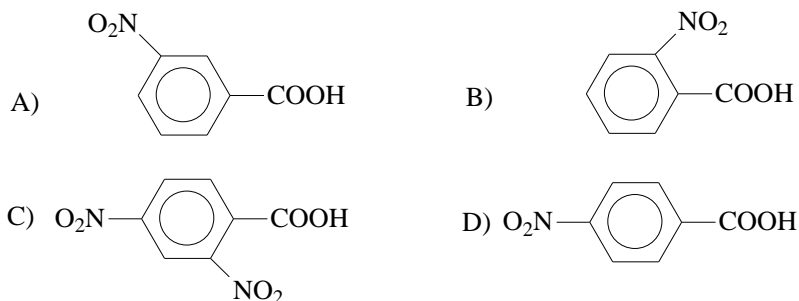


- A) oxidation B) reduction C) hydrolysis D) substitution

24. Hydrolysis of an ester produces:

- A) aldehyde and ketone B) acid C) acid and alcohol D) alcohol

25. Product of benzoic acid nitration is:



26. Which of the following equations represents an addition reaction?

- A) $\text{CH}_3\text{CH}_2\text{CH}_3 + \text{Br}_2 \rightarrow \text{CH}_3\text{CH}_2\text{CH}_2\text{Br} + \text{HBr}$
B) $\text{CH}_3\text{CH}=\text{CH}_2 + \text{HBr} \rightarrow \text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$
C) $\text{CH}_3\text{CH}_2\text{COOH} + \text{NaOH} \rightarrow \text{CH}_3\text{CH}_2\text{COONa} + \text{H}_2\text{O}$
D) $\text{CH}_3\text{COOH} + \text{CH}_3\text{CH}_2\text{OH} \rightarrow \text{CH}_3\text{COOCH}_2\text{CH}_3 + \text{H}_2\text{O}$

27. The building unit of cellulose is:

- A) α -glucose B) α - and β -glucose C) α -glucose and α -mannose D) β -glucose

28. Which of the following structures represents the amino acid glycine at pH 1?



29. All of the substances listed below are natural polymers except:

- A) proteins B) nucleic acids C) polysaccharides D) lipids

30. The products of protein hydrolysis are:

- A) amines B) amino acids C) amines and esters D) amines and amino acids