

Test # 4

Name _____

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

1. ^{14}C and ^{14}N have the same mass number. Therefore, they are:
A) isotopes **B) isobars** C) isomers D) isotopic isomers
2. The modern periodic table is arranged based upon atomic:
A) radius **B) number** C) density D) mass
3. The forces of attraction that exist between nonpolar molecules are called:
A) covalent bonds **B) Van der Waals forces**
C) ionic bonds D) electrovalent bonds
4. What type of bond do all of the molecules of H_2 , O_2 , NH_3 , and CO have in common?
A) covalent B) ionic C) metallic D) polar
5. When the equation representing the reaction $\text{Al}(\text{s}) + \text{O}_2(\text{g}) \longrightarrow \text{Al}_2\text{O}_3(\text{s})$ is completed and balanced and all coefficients are reduced to the lowest whole-number terms, the coefficient of $\text{O}_2(\text{g})$ is:
A) 1 B) 2 **C) 3** D) 4
5. A catalyst can speed up the rate of a given chemical reaction by:
A) increasing the equilibrium constant in favor of products
B) lowering the activation energy required for the reaction to occur
C) raising the temperature at which the reaction occurs
D) increasing the pressure of reactants, thus favoring products
6. In which of the following reactions involving gases would the forward reaction be favored by an increase in pressure?
A) $\text{A} + \text{B} \rightleftharpoons \text{AB}$ B) $\text{A} + \text{B} \rightleftharpoons \text{C} + \text{D}$
C) $2\text{A} + \text{B} \rightleftharpoons \text{C} + 2\text{D}$ **D) $\text{AC} \rightleftharpoons \text{A} + \text{C}$**

7. Which of the following dilute solutions has a boiling point closest to 100°C?
A) 0.010 mol/L CuSO₄ B) 0.010 mol/L CH₃COOH
C) 0.010 mol/L FeCl₃ D) 0.010 mol/L Na₂SO₄
8. For the system at equilibrium $2 \text{SO}_2 (\text{g}) + \text{O}_2 (\text{g}) \rightleftharpoons 2 \text{SO}_3 (\text{g}) + \text{heat}$, decreasing the temperature increases the number of moles of which of the following when equilibrium is reestablished?
A) SO₃ (g) B) O₂ (g) C) SO₂ (g) D) both, O₂ (g) and SO₂ (g)
9. In the ionic solid NH₄NO₃, the ions present are:
A) NH₄⁺ and NO₃⁻ B) N⁵⁺, H⁺ and O²⁻
C) NH₄⁺, N⁵⁺ and O²⁻ D) NH₃, H⁺ and NO₃⁻
10. In the reaction $2 \text{ZnS} + 3 \text{O}_2 \rightarrow 2 \text{ZnO} + 2 \text{SO}_2$ sulfur atom is:
A) a reducing agent and oxidizes B) a reducing agent and reduces
C) an oxidizing agent and oxidizes D) an oxidizing agent and reduces
11. Which one of the following processes describes the electrolytic dissociation of H₂SO₄?
A) $\text{H}_2\text{SO}_4 \rightarrow 2\text{H}^+ + 4\text{SO}_4^{2-}$ B) $\text{H}_2\text{SO}_4 \rightarrow \text{H}^+ + \text{SO}_4^-$
C) $\text{H}_2\text{SO}_4 \rightarrow 2\text{H}^+ + \text{SO}_4^{2-}$ D) $\text{H}_2\text{SO}_4 \rightarrow \text{H}^{2+} + \text{SO}_4^{2-}$
12. Which acid reacts with ammonia to produce the salt ammonium sulfate?
A) hydrochloric B) nitric C) phosphoric D) sulfuric
13. Of the compounds below, in which one does sulfur have the lowest oxidation number?
A) H₂SO₄ B) H₂S C) SO₂ D) Na₂SO₃
14. A product of neutralization of a strong acid with a strong base is:
A) KI B) AgNO₃ C) CaCO₃ D) CuSO₄
15. Which substance releases hydrogen when it reacts with steam?
A) Al B) Li C) CH₃OH D) H₂S

16. The third member of alkene series is:

- A) methene B) ethene C) propene **D) butene**

17. Compounds which have the same molecular formula but different molecular structures are called:

- A) isomers** B) isotopes C) allotropes D) homologs

18. The fermentation of glucose will produce carbon dioxide and:

- A) a polymer B) a soap C) an ester **D) an alcohol**

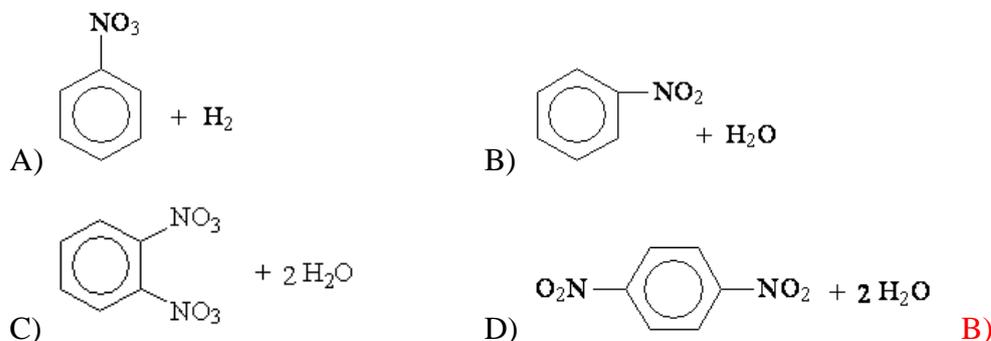
19. Ethyl formate can be produced by heating conc. H_2SO_4 , ethanol and formic acid. This type of reaction is called:

- A) fermentation B) saponification C) polymerization **D) esterification**

20. Oxidation of primary alcohols produces:

- A) aldehydes** B) ketones C) diols D) esters

21. Products of the reaction between benzene and nitric acids are:



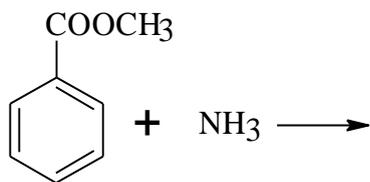
22. Which organic structure is propanone?

- A) $\text{CH}_3\text{CH}_2\text{CH}_3$ B) $\text{CH}_3\text{—O—CH}_3$
- C) $\text{CH}_3\overset{\text{O}}{\parallel}\text{C—OH}$ D) $\text{CH}_3\overset{\text{O}}{\parallel}\text{C—CH}_3$ **D)**

23. The reagent that can be used to distinguish between pentanal and pentanone is

- A) Ag_2O** B) FeCl_3 C) PbS D) AgCl

24. What is the product of the reaction?



- A) aniline B) benzamide
C) benzoic acid D) methylamine

25. Primary amines react with carbonyl compounds. The products obtained are called:

- A) nitriles B) nitrates C) diazonium salts D) imines

26. What should be used as the reagent A in the reaction:



- A) Cl_2 B) HCl C) FeCl_3 D) PCl_3

27. Glucose and fructose are:

- A) monosaccharides B) disaccharides C) aldehydes D) ketones

28. All natural amino acids have L-configuration except:

- A) alanine B) glycine C) lysine D) cysteine

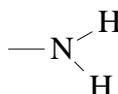
29. Amino acids are linked by peptide bonds to form polypeptide chains. Which of the following groups is assigned as a peptide group?



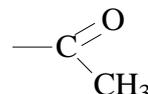
A



B



C



D

30. Both cellulose and proteins are classified as:

- A) aldehydes B) polymers C) esters D) ketones