Oromia Development Association Special Boarding School, Adama Branch

CHEMISTRY PRACTICE QUESTION FROM GRADE- 9 FOR G-11&12, 2014

Use the following information if necessary

Atomic mass of the elements

Na	Mg	Al	k	Ca	Be	S	O	P	N	C	B	H
23	24	27	39	40	4	32	16	31	14	12	9	1

Instruction I. **Write true if the statement is correct and false if the statement is incorrect**

1. In non- redox reactions electrons are exchanged between the reacting substances.
2. Absolute zero is the lowest attainable temperature or starting point of Kelvin scale.
3. A less reactive element displaces a more reactive element from a compound.
4. During evaporation volume of a liquid decreases in closed system
5. Liquids are fluids but its particle motion is less than that of particles of gas.

PART II CHOOSE THE BEST ANSWER FROM THE GIVEN ALTERNATIVES

6. Which of the following statements about chemical equations is **INCORRECT**?
   A. Chemical equations should be governed by the laws of conservation of mass.
   B. Coefficients in chemical equations should not be changed while balancing equations, but subscripts may be changed.
   C. Chemical equations should represent actual chemical reaction.
   D. Formulas of the products should be written at the right hand side of a chemical equation, whereas formulas of reactants on the left hand side.
7. Which of the following statements does **NOT** correctly describes the following reaction?

   $N_2\,(g) + 3H_2\,(g) \longrightarrow 2NH_3\,(g)$

   A. 1 mole of N_2 react with 3 moles of H_2 to give 2 moles of NH_3
   B. 28g of N_2 react with 6g of H_2 to produce 34g of NH_3

C. 3 liters of N_2 reacts 2 liters of H_2 to produce 2 liters of NH_3

D. 1 molecules of N_2 reacts with 3 molecules of H_2 to gives 2 molecules of NH_3

8. Which one of the following types of chemical reaction is **NOT** correctly paired with its example?

A. Heating of metallic nitrate ▸ Analysis reaction

B. A metal hydroxide reacting with an Acid Synthesis reaction

C. A metal reacting with water ▸ single displacement reaction

D. A calcium carbonate reacting with hydrogen chloride Metathesis reaction

9. Which one of the following chemical reactions only produces one product?

A. Combination reaction C. Double decomposition reaction

B. Single replacement reaction D. analysis reaction

10. Which one of the following reaction represents a double replacement reaction?

A. $N_2\ (g) + 3H_2\ (g) \rightarrow 2NH_3\ (g)$

B. $2\ HBr + Cl_2 \rightarrow 2HCl + Br_2$

C. $Ba(NO_3)_2 + Na_2SO_4 \rightarrow BaSO_4 + 2NaNO_3$

D. $CaCO3 \xrightarrow{\triangle} CaO + CO_2$

11. The chemical formula of ethanol is C_2H_5OH. Therefore;

A. The qualitative meaning of the formula describes that molecules contains two atoms of carbon.

B. The quantitative meaning indicates that the formula represents ethanol.

C. The quantitative meaning indicate that the formula contains molecular mass of 46g/mol.

D. The qualitative meaning suggest that one mole of ethanol.

12. Which of the following is not conserved in chemical reaction?

A. Molecules B. Mass C. Atom D. energy

13. Which one of the following reactions is a redox reaction?

A. $Fe^{3+}(aq) + 3Cl^{-}(aq) \longrightarrow FeCl_3(s)$

B. $NaOH(aq) + HCl(aq) \longrightarrow NaCl\ (aq) + H_2O(l)$

C. $AgNO_3(aq) + HCl(aq) \longrightarrow AgCl(s) + HNO_3(aq)$

D. $2Ca(s) + O_2(g) \longrightarrow 2CaO(s)$

14. Which statement correctly describes redox reactions?

A. The oxidation occurs before the reduction reaction

B. The oxidation occurs spontaneously but the reduction does not

C. The oxidation and reduction reaction occurs simultaneously

D. The oxidation occurs after the reduction reaction.

15. Which one of the following set of choices contains the correct increasing order of oxidation state of chlorine from least to greatest?

A. Cl_2,HCl,HOCl,$HClO_3$ C. HCl, Cl_2, HOCl, $HClO_3$

B. HCl, HOCl, Cl_2, $HClO_3$ D. Cl_2, $HClO_3$, HOCl, HCl

16. What is the oxidation number of sulfur in $Ca(HSO4)_2$, $S_2O_3^{-2}$, S_8 & S^{-2} respectively?

A. +6, -4, 0, -2 C. +6, +2, 0, -2

B. +6, -2, 0, +2 D. +6, +2, 1, -2

17. Given the redox reaction;

$2I^-(aq) + Br_2(l) \longrightarrow 2Br^-(aq) + I_2(s)$

What occurs during this reaction?

A. The I^- ion is oxidized and its oxidation number increases.

B. The I^- ion is oxidized and its oxidation number decreases.

C. The I^- ion is reduced and its oxidation number is increases.

D. The I^- ion is reduced and its oxidation number is decreases

17. How do you define oxidation in terms of electron transfer? It is the

A. Combining of oxygen with other substances or the additions of oxygen to substances

B. Process in which there is a decreases in the oxidation number of an element.

C. Process whereby electrons are added to atoms or ions (increase in oxidation number of an element).

D. Process whereby electrons are removed from atoms or ions.

18. Which one of the following statements is true about oxidizing and reducing agents?

A. A reducing agent is reduced

B. An oxidizing agent is gains electron(s)

C. A reducing agent gains electron(s)

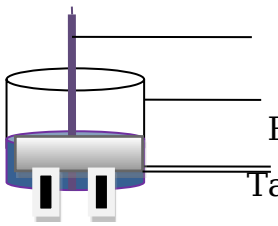
D. An oxidizing agent causes reduction to occur

19. Which of the following is oxidation?

A. $Fe \longrightarrow Fe^{2+} + 2e^-$ C. $MnO_4^- \longrightarrow MnO_2$

B. $Al^{3+} + 3e^- \longrightarrow Al$ D. $Cr^{3+} \longrightarrow +3^- Cr$

20. Consider the following experimental setup:



If the thermometer reading was fall down ward during the reaction, one can conclude from this experiment, the reaction is:

A. An endothermic reaction C. A combination reaction

B. An exothermic reaction D. A neutralization reaction.

21. Which equation is correctly balanced?

A. $Cu + H_2SO_4 \rightarrow CuSO_4 + H_2O + SO_2$ C. $2Fe + 3O_2 \rightarrow 2Fe_2O_3$

B. $2Na + 2H_2O \rightarrow 2NaOH + H_2$ D. $8Cu + S_8 \rightarrow 8Cu_2S$

22. Which of the following statements is false concerning ΔH?

A. It is the difference between the heat energies of reactants and products.

B. It represents a change in heat energy.

C. It is negative, if heat energy of product is greater than heat energy of reactant

D. It is positive, if heat energy of product is greater than heat energy of reactant

23. Which of the following equation is Endothermic

A. $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)\ \Delta H < 0$

B. $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g) + 90.5KJ/mole$

C. $N_2(g) + 3H_2(g) \longleftrightarrow 2NH_3(g)\ \Delta H = -90.5KJ/mole$

D. $C_2H_6(g) \longleftrightarrow C_2H_4(g) + H_2(g)\ \ \Delta H > 0$

24. Consider the following equilibrium system;

$CaCO_3(S) + 2HF(g) \Leftrightarrow CaF_2(S) + H_2O(g) + CO_2(g)$ .Which of the following expression represent the concentration of carbon dioxide?

A. $[co_2] = Kc\dfrac{[H_2O]}{[HF]^2}$

C. $[co_2] = Kc\dfrac{[HF]^2}{[H_2O]}$

B. $[co_2] = Kc\dfrac{[CaCO_3][HF]^2}{[H_2O]}$

D. $[co_2] = Kc\dfrac{[CaCO_3][HF]^2}{[CaF_2][H_2O]}$

25. The following equation represents the oxidation of ammonia

$NH_3 + O_2 \longrightarrow NO + H_2O$

If the equation is correctly balanced, what are the balancing coefficients respectively?

A. 6, 3, 3 & 1 C. 2, 2 ,2 &6

B. B. 4, 6, 4 & 5 D. 4, 5, 4 & 6

26. Which of the following **not true** about characteristics of a reaction at equilibrium?

A. Concentration of the reactant(s) and product(s) are equal

B. Rate of forward and reverse reactions is equal

C. The difference in between concentration of product(s) and reactant(s) is negligible

D. If it's exothermic in one direction, it is also endothermic in the reverse direction

27. Unit of equilibrium constant for $H_2 + I_2 \rightleftharpoons 2HI$ is

A. No units C. dm^3mol^{-1}

B. $moldm^{-3}$ D. None of these

28. Consider the following equilibrium system:

$CO(g) + H_2O(g) \rightleftharpoons CO_2(g) + H_2(g)$

Which of the following actions would cause the concentration of $H_2(g)$ to decrease?

A. Adding CO (g) B. Adding H_2O (g) C. Removing CO_2 (g) D. Removing $H_2O(g)$

29. In which of the following systems will the position of equilibrium shift to the left upon an increase in pressure, but to the right upon an increase in temperature?

A. $CO_2(g) + H_2(g) \rightleftharpoons CO(g) + H_2O(g) \quad \Delta H > 0$

B. $C_2H_4(g) + H_2O(g) \rightleftharpoons C_2H_5OH \quad \Delta H < 0$

C. $C_2H_6(g) \rightleftharpoons C_2H_4(g) + H_2(g) \quad \Delta H > 0$

D. $2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g) \quad \Delta H < 0$

30. The following reaction is at equilibrium. $Cl_2(g) + 3F_2(g) \rightleftharpoons 2ClF_3(g)$. How will the system respond if the volume is increased at constant temperature?

A. The reaction will shift to the left.

B. The reaction will shift to the right.

C. There will be no change to the equilibrium position

D. All

31. If the equilibrium concentrations found in the reaction: $2A(g) + B(g) \rightleftharpoons C(g)$ are:

[A] = 2.4 x 10^{-2}M, [B] = 4.6 x 10^{-3} M, and [C] = 6.2 x10^{-3} M, then what is the value of Kc?

A. 1.3 x 10^{-4} B. 2.3 x 10^{3} C.5.6 ×10^{3} D. 5.6 x10^{2}

32. When a catalyst is added to a system at equilibrium, a decrease occurs in the

A. activation energy

B. heat of reaction

C. potential energy of the reactants

D. potential energy of the products

33. What is the equilibrium constant expression for the following reaction?

$2Hg(g) + O_2(g) \rightleftharpoons 2HgO(s)$

A. $K = 1/[Hg]^2[O_2]$ C. $K = [HgO]^2 / [Hg][O_2]$

B. $K = [Hg]^2[O_2]$ D. $K = [2HgO] / [2Hg][O_2]$

34. If we add a catalyst to a chemical reaction that is at equilibrium, then a catalyst increases the rate at which equilibrium is achieved:

A. But it does not change the composition of the equilibrium

B. And will change the composition of the equilibrium

C. And will shift the equilibrium in the direction that produces heat

D. And will shift the equilibrium in the direction that occupies a larger volume.

35. In which of the following the yield of the product in the reaction,

$X_{2\,(}g) + 2Y \rightleftharpoons Z\,(g)$ + heat, would be higher

A. High temperature and high pressure C. low temperature and high pressure

B. High temperature and low pressure D. low temperature and low pressure

36. The statement "Matter is neither created nor destroyed during a chemical reaction" is the law of

A. multiple proportion C. definite proportion

B. constant composition D. Conservation of mass

37. Why do higher temperatures speed up the rates of chemical reactions?

A. Higher temperature decreases the kinetic energy of the particles

B. As the temperature increases the collision between the reacting particles decreases

C. Higher temperature increases the kinetic energy of the particles

D. Higher temperatures change the nature of the reactants.

38. The state of a chemical equilibrium is affected by all of the following factors **EXCEPT**:

A. Temperature B. Catalyst C. Pressure D. Concentration

39. If 3 mole of Magnesium reacted with 3moles of oxygen according to the following balanced equation:

$2Mg + O_2 \rightarrow 2MgO.$

Which of the following is **not** true about the reaction?

A. Magnesium is the limiting reactant C. Oxygen is the excess reactant

B. 1.5 moles remains left as unreacted amount D. 6mole of Magnesium oxide is formed

40. Disproportionate reaction is:

A. It is types of double displacement reaction.

B. Types of redox reaction in which single element undergo both oxidation and reduction

C. It is the type of non-redox reaction

D. Types of redox reaction in which different elements undergo both oxidation and reduction reaction.

41. Consider the following experimental results:

	Experiment-1	Experment-2
Reactant	Na(s) and HCl(aq)	Cu(s) and HCl(aq)
Temperature	21°c	21°C
Concentration	0.50M	0.50M
Rate of reaction	fast	Slow

Which factor would account for the faster rate of the reaction in experiment-1

A. Temperature B. Surface C. Concentration D. Nature of reactants

42. Which of the following is **true** about actual, theoretical and percentage yield?

A. Percentage yield = $\frac{Theoretical\,yield}{Actual\,yield} x 100$

B. Actual yield is less than theoretical yield

C. Actual yield is the amount of product calculated from the balanced chemical equation

D. Theoretical yield is the experimental yield of the product.

42. What is the volume of two moles of oxygen gas at STP?

A. 67.2 L B. 22.4 L C. 11.2 L D. 44.8.00

43. If 8g of hydrogen and 32g of oxygen are mixed, what mass of water is produced according to the reaction bellow? (At mass of H=1, 0=16)

$2H_2+O_2 \longrightarrow 2H_2O$

A. 36g B.72g C. 54g D. 18g

44. How many volume of oxygen gas are produced in the composition of 4 moles of $KClO_3$ at STP? $2KClO_3(s) \longrightarrow 2kCl\,(s) + 3O_{2(g)}$

A. 134.4L B. 168L C. 130.4L D. 67.2L

45. A solid is state of matter that has a;

A. Definite volume and a definite shape
C. Indefinite volume and indefinite shape
B. Indefinite volume and a definite shape
D. Indefinite shape and definite volume

46. Which one of the following is non-volatile liquid?

A. Benzene B. Molten ionic compound C. Acetone D. Ethyl alcohol

47. Which one of the following statement best describes the particles of gases?

A. They very close together and able to vibrate
B. They are stationary and not able to vibrate
C. They are very close together and ordered
D. They are far apart and disorder

48. At pressures less than 1 atm water will boil at

A. Temperature lower than 100°C.
C. Temperature higher than 100°C
B. 4°C
D. 100°C

49. According to the kinetic-molecular theory, particles of an ideal gas

A. Attract each other but do not collide.
B. Repel each other and collide.
C. Neither attracts nor repels each other but collide.
D. Neither attracts nor repels each other and do not collide.

50. The rate of diffusion of CH_4 is twice that of an unknown gas. What is the molecular mass of unknown gas? (At. Mass of C=12, H=1)

A. 32 B. 64 C. 16 D. 44

51. Gas A diffuses twice as fast as gas B. Gas B has a molecular weight of 60.0 g/mol. what is the molar mass of gas A?

A. 15 g/mol B. 120 g/mol C. 30 g/mol D. 90 g/mol

52. The increasing order of rate of diffusion of SO_2, CO_2 & N_2, is

A. $SO_2 < CO_2 < N_2$
C. $N_2 < CO_2 < SO_2$
B. $SO_2 > CO_2 > N_2$
D. $N_2 > CO_2 > SO_2$

53. Which of the following describes a liquid state?

A. Definite volume and no specific shape
B. Definite shape but no definite volume
C. Neither definite shape nor definite volume
D. Definite volume and definite shape

54. At higher altitudes the boiling points of liquids.

A. Increases, because pressure decreases.

B. Decreases, because pressure increases.

C. Remains the same.

D. Decreases, because the atmospheric air become more dense

55. What is the volume of 32 g of sulphur dioxide gas at 27 ^{0}c and 0.50 atmospheres?

(Given: R=0.082 L. atm.K^{-1} mol^{-1}, molar mass: O=16g/mol,S=32 g/mol)

A. 24.63 L B. 3.0 L C. 67.2 L D. 24.63 L

56. The amount of heat energy absorbed by solid substances to convert it into liquid state is:

A. Molar heat of crystallization

B. Molar heat of fusion

C. Molar heat of solidification

D. Molar heat of sublimation

57. Which of the following statement best describes a physical change?

A. Fermentation of ‘tella‘

B. Souring of milk

C. cutting of paper into pices.

D. Burning of paper in air

58. How many moles of NO_2 gas are required to produce 6 moles of HNO_3 according to the following reaction?

$3NO_2+H_2O \longrightarrow 2HNO_3+NO$

A. 4 moles B. 6 moles C. 3 moles D. 9moles

59. In the three state of matter, which one shows the increasing order of intermolecular force?

A. Gas < Liquid < Solid

B. Gas > Liquid > Solid

C. Liquid < Solid < Gas

D. Gas = Liquid < Solid

60. Which of the following equations correctly combines Boyle's and Charles' Laws?

A. T1V1=T2V2 C. $\frac{P1T1}{V1}=\frac{P2T2}{V2}$

B. $\frac{P1V1}{T1}=\frac{P2V2}{T2}$

D. $\frac{T1V1}{P1}=\frac{T2V2}{P2}$

61. If you heat a 5 L balloon from a temperature of 25^0C to 50^0C, its new volume will be:

A. 10 L B. 5.42L C. 2.5 L D. 4.61L

62. the vapor pressure of a liquid increases when:

A. The temperature is raised
B. The temperature is lowered
C. Surface area is decreased
D. Intermolecular force is increased

63. Which statement about heat of vaporization and heat of condensation is correct?

A. The heat of condensation is equal in magnitude but opposite in sign when compared to the heat of vaporization
B. The heat of vaporization represents the heat released when a gas becomes a liquid, and the heat of condensation represents the heat required for a liquid to become a gas
C. There is no general relationship between these two quantities and the values depend on the substance involved.
D. The heat of vaporization is always less than the heat of condensation

64. Which one of the following statements most accurately relates the properties of a liquid at room temperature with its vapor pressure

A. Liquid with a low vapor pressure will probably have a high surface area and a high boiling point.
B. A liquid with a low vapor pressure will probably have a low surface area and a high boiling point.
C. A liquid with a low vapors pressure will probably have high intermolecular forces and a low boiling point.
D. A liquid with a high vapor pressure will probably have high intermolecular forces and a low boiling point

65. Charles' law states that

A. when the temperature of a gas is constant, its volume is directly proportional to its volume
B. when the temperature of a gas is constant, its volume is inversely proportional to its pressure

C. when the pressure of a gas is constant, its volume is inversely proportional to its temperature

D. when the pressure of a gas is constant, its volume is directly proportional to its temperature

66. At what temperature ice and water both exist together under normal atmospheric pressure?

A. Below 273.15K B. at 273.15k C. above 273.15K D. none of these.

67. How are the boiling and freezing points of a sample of water affected when salt is dissolved in the water?

A. . The boiling point decreases and the freezing point decreases.

B. The boiling point decreases and the freezing point increases.

C. The boiling point increases and the freezing point decreases.

D. The boiling point increases and the freezing point increases

68. The migration of molecules of different gases as a result of random molecular motion is known as

A. Osmosis B. evaporation C. Diffusion D. effusion

69. Which of the following is correct?

A. $1L=1dm^3$ B. $1L=10dm^3$ C. $10L=1dm^3$ D. $1L=1m^3$

70. Collision theory states that:

A. Very few reactants involved in the reaction C. Effective collisions lead to chemical reactions

B. All collisions lead to chemical reaction D. Most collisions lead to chemical reactions

71. Which of the following is not characteristic of solid:

A. High Rigidity B. Regular Shape C. High density D. High compressibility

72. Temperature-volume relationship of a given mass of a gas at constant pressure is given in the table below.

Temperature in K	**Volume in mL**
300	24615
200	16410
100	Y
10	820.5

What is the missing volume, Y, in mL

A. 1641 B. 16410 C. 8205 D. 82005

73. What is the lowest attainable temperature?

A. 100°c B. +273°c C. 273K D. 0K

74. The states of matter do not occur naturally on Earth?

A. Liquid B. Plasma C. Gas D. Solid

75. Which of the following statement is correct about a given reaction?

$AB + C \longrightarrow AC + B$

A. B is more reactive than C C. A is non-metallic ion

B. C is more reactive than B D. B is non-metal and A is an inert gas.

76. If the rate of melting equals the rate of freezing...

A. there is more liquid there is more solid

B. the system is working towards equilibrium c. the system is in equilibrium

77. When you increase your altitude, the air pressure

A. Increases B. Stays the same C. decreases D. unknown

78. What is water's melting point?

A. 32°C B. 0°C C. 32 F D. 0 F

79. Which of the following will evaporate the fastest?

A. Water at 20°C C. Water at 0°C

B. Water at 40°C D. All of the above evaporate

Instruction III. Work ou

80. At constant pressure, by what fraction of its volume will a quantity of gas changes if the temperature changes from -173 °c to 27°c?

81. A certain gas occupies a volume of $10m^3$ at a pressure of 100kpa. If its volume is increased to $20m^3$. What would be the pressure of the gas assuming the temperature remains constant