

SELF TEST EXAM

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DIRECTIONS: THIS PAPER CONTAINS CHEMISTRY EXAMINATION FOR GRADE 12. THE EXAMINATION CONTAINS 72 ITEMS.THERE IS ONLY ONE BEST ANSWER FOR EACH ITEM. CHOOSE THE BEST ANSWERS FROM THE GIVEN ALTERNATIVES. (Items from 57-75 will helps to you for this 1st sem. final exam)

1. For the transition metal with the electron configuration $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6$, how many **unpaired** electrons are present in its $+2$ ion in the ground state? A. 0 B. 2 C. 4 D. 6
2. For which pair of species are the radii most similar?
A. Li and Na B. Na and Mg C. Mn and Fe D. Fe^{2+} and Fe^{3+}
3. In the Born-Haber calculation of the lattice enthalpy of LiF from its elements, which process is exothermic? A. dissociation energy of $F_2(g)$ B. electron affinity of $F(g)$ C. ionization energy of $Li(g)$ D. sublimation energy of $Li(s)$
4. Which of the acids below has the strong ionizable hydrogen atoms per molecule? A. $HClO_4$ B. HF C. H_2CO_3 D. CH_3COOH
5. The kinetic theory of gases assumes all of the following **except**:
A. Gases are composed of particles in random, ceaseless motion. B. The sizes of gas particles are negligible compared to the size of the container. C. Gas particles do not attract or repel each other. D. When gas particles collide, kinetic energy is lost.
6. A sample of He gas in a flexible container at room temperature exhibits a certain pressure. What will be the new pressure when the absolute temperature and volume of the container are both halved? The pressure of the He will be
A. the same. B. doubled. C. halved. D. quadrupled.
7. The molecules in a sample of pure liquid dichloromethane, CH_2Cl_2 , experience which of the following intermolecular forces?
A. dispersion forces only B. dipole-dipole forces only C. A and B D. A, B, and C
8. What property of the oxygen atom is represented by the equation $O(g) + e^- \rightarrow O^-(g)$?

- A. electronegativity B. first electron affinity C. first ionization energy D. lattice energy
9. Salts absorb water from the atmosphere to form a solution is ?
A. Hygroscopic Efflorescent salt C. Deliquescent D. Basic
10. Which one of the following elements has the highest metallic character?
A. Bromine B. Fluorine C. Iodine D. Chlorine
11. One of the following is **not** a preparatory stage for the production of leather. Which one is it?
A. Soaking B. Scudding C. Hair removal D. Crusting
12. One of the following statements is related. Which one is it?
A. Charge of electrons are determined by William Crook B. Charge of proton was discovered by James Chadwick C. Charge to mass ratio of an electron was determined by J.J Thomson D. Periodic law was formulated by Mosely
13. Which properties of the element are correct? A. Electronegativity of $\text{Li} > \text{Mg} > \text{O} > \text{Cl}$ B. Ionization energy of $\text{Mg} < \text{O} < \text{S} < \text{Cl}$ C. Atomic radius of $\text{Li} > \text{Mg} > \text{O} > \text{F}$ D. Metallic character of $\text{Mg} < \text{Li} < \text{O} < \text{F}$
14. Which of the following is the purest form of iron?
A. Cast iron B. Pig iron C. Wrought iron D. Limonite
15. Of the following methods which one is a traditional food preservative method?
A. Vacuum packing B. freeze drying C. salting D. freezing
16. What is the pH of a solution containing 0.0002 mole H^+ per Liter at 25°C ? ($\log 2 = 0.3$)
A. 3.7 B. 10.3 C. 2 D. 4
17. If a certain element has an electron configuration of $1\text{s}^2 2\text{s}^2 2\text{p}^6 3\text{s}^2 3\text{p}^2$, To which block and group of the periodic table does it belong? A. P, IVA B. P, IIA C. S, IVA D. S, IIA
18. How many grams are 1.5 moles of CaCO_3 ? ($\text{Ca}=40, \text{C}=12, \text{O}=16$)
A. 100g B. 50g C. 200g D. 150g
19. A salt solution was treated with barium nitrate and formed a white precipitate. The salt could most likely be A. NH_4Cl B. KNO_3 C. Na_2SO_4 D. $\text{Ca}(\text{ClO}_3)_2$
20. A compound with a molecular mass of 92 was found to be composed of 30.4% Nitrogen and 69.56% Oxygen. What is the molecular formula of this compound? (atomic mass $\text{N}=14, \text{O}=16$)
A. N_2O_3 B. N_2O_4 C. N_2O D. NO_2
21. The periodic table is **not** useful for predicting the

- A. Speed of a chemical reaction B. Behavior of many compounds C. the physical and chemical properties of elements D. formula of compounds
22. Given the following balanced equation representing the reaction $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$, How many liters of hydrogen gas at STP is liberated when 6.54g of zinc is dissolved in an excess hydrochloric acid? ($\text{Zn}=64.5, \text{Cl}=35.5$) A. 2.24L B. 1.12L C. 11.2L D. 22.4L
23. Which one of the Oxides forms basic solution in water? A. CO B. BaO C. SO_2 D. Al_2O_3
24. Which one of the following method is used to distinguish between ethane and ethene? A. Treating both compounds with bromine water B. Treating both compounds with a acid base indicators C. Dissolving both compounds in benzene D. comparing the colors of the compounds
25. Which chemical is used to preserve food? A. NaOH B. CaO C. H_2SO_4 D. NaCl
26. Which one of the following are **not** the characteristics of chemical industries?
- A. Use save operation methods in their manufacturing process B. Involve chemical reactions to transform raw materials into finished and semi-finished products C. Use naturally available raw materials to produce desire products D. Consume relatively small quantities of energy during the manufacturing process
27. Which one of the following is **not** true about a chemical reaction?
- A. a chemical reaction involves change in composition B. a chemical reaction always forms new substance C. a chemical reaction is either exothermic or endothermic D. a chemical reaction results in the disappearance of mass
28. Covalent bonding is
- A. a bond that results from the attraction between the metal ions and the surrounding sea of electron B. a bond in which an atom donates both electrons of the bond C. the binding force formed by sharing of electrons in the molecules D. the force of attraction between oppositely
29. 3-methyl-4,4,5-trimethyl-2-heptanol is_____? A. 4° B. 3° C. 2° D. 1°
30. Which one of the following is not laboratory preparation of alkynes? A. Dehydro halogenation of vicinal dihalides with base NaOH and KOH B. Alkylolation of sodium acetylide with primary alkyl halide C. Dehydro halogenation of alkyl halide D. Addition of hydrogen with alkenes in the presence of pt.
31. What are the general formulas of olefins and alcohol respectively? A. C_nH_{2n} & $\text{C}_n\text{H}_{2n}\text{OH}$ B. C_nH_{2n} & $\text{C}_n\text{H}_{2n+1}\text{OH}$ C. $\text{C}_n\text{H}_{2n-2}$ & $\text{C}_n\text{H}_{2n}\text{OH}$ D. $\text{C}_n\text{H}_{2n+2}$ & $\text{C}_n\text{H}_{2n-1}\text{OH}$

32. How many significant figures are there in 800505 and 0.0030050 respectively?
A.6&7 B.6&3 C.6&6 D.6&5
33. Which set contains only ionically bonded compound ? A. N_2 , BF_3 , HCl B. H_2O , S_2O , $BeCl_2$
C. HCl , $BeCl_2$, H_2O D. LiH , $BeCl_2$, $MgCl_2$
34. What is the frequency in S^{-1} of the electromagnetic radiation emitted by hydrogen atom, when electron drops from the $n=3$ level to the $n=2$ level? A. $3.083 \times 10^{15} S^{-1}$ B. $4.568 \times 10^{14} S^{-1}$
C. $2.94 \times 10^{-9} S^{-1}$ D. $3.47 \times 10^{-19} S^{-1}$
35. Which one of the following is arranged in the increasing order of bond angle? A. H_2O , NH_3 , $SnCl_2$, CO_2 B. NH_3 , H_2O , CO_2 , $SnCl_2$ C. NH_3 , H_2O , $SnCl_2$, CO_2 D. $SnCl_2$, H_2O , NH_3 , CO_2
36. What is the shape of the $XeOF_4$? A. Square pyramidal B. Square planar C. Seesaw D. Angular
37. What is the bond order of O_2^{-1} ? A. 2 B. 1.5 C. 1 D. 3
38. In which specific subshell will an electron having the quantum numbers $n=3$, $l=1$ and $m_l=-1$ be found ? A. 3f B. 3s C. 3p D. 3d
39. Which one is true concerning the following reaction? $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$, $\Delta H = -92 \text{ KJ.mol}^{-1}$? A. Increasing the pressure at equilibrium will favor the forward reaction. B. Lowering temperature at equilibrium will proceed the reaction in the backward direction C. Decreasing the volume has no effect on the above reaction D. temperature, pressure and volume have no effect on equilibrium.
40. Which of the following statements is TRUE about equilibrium reaction?
A. more reactants are transformed into products
B. There are equal amounts of reactants and products
C. The rate constant for the forward reactions equals that of the reverse reaction
D. The rate for the forward reactions equals that of the reverse reactions
41. Which principles states that, electron occupy the lowest energy orbital available before entering the higher energy orbital? A. Aufbau principle B. Hund's principle C. Pauli's principle D. Lechateliers principle
42. The equilibrium constant for the reaction $X_2(g) + Y_2(g) \rightleftharpoons 2XY(g)$, is 2×10^8 at 500K. In presence of a catalyst, equilibrium is attained five times faster. The equilibrium constant, in presence of the catalyst, at 500K is: A. 10×10 B. 2×10^8 C. 4×10^7 D. 10×10^9

43. The rate law for the reaction $A + B \rightarrow C$ is: $\text{Rate} = k[A][B]$ If the concentration of reactant 'B' is doubled, keeping the concentration of 'A' constant, what will be the value of the rate constant? A. The same B. halved C. quadrupled D. doubled

44. Which molecule listed below has two sigma (δ) and two pi (π) bonds?
A. N_2 B. C_2H_4 C. N_2F_2 D. HCN

45. Silver ($Z=47$) has several known isotopes, but two occur naturally, ^{107}Ag and ^{109}Ag .
Given the following mass spectrometric data, calculate the atomic mass of Ag

Isotope	Mass(amu)	Abundance(%)
^{107}Ag	106.90509	51.84
^{109}Ag	108.90476	48.16

A. 107.86amu B. 107.4amu C. 107.94amu D. 108.9amu

46. A sample of water taken from ice, rain or sea has the same ratio by mass of hydrogen and oxygen. This chemical fact explains the law of :? A. Conservation of mass B. Mass action C. Definite proportion D. Multiple proportion

47. Which of the following factors **does not** affect the rate of reaction?
A. concentration B. surface area C. Enthalpy D. Temperature

48. Which of the following statements is not true?

A. Naturally derived soaps consist of a soluble salt of long chain fatty acid. B. Triacylglycerols are esters of glycerol and long chain carboxylic acid C. Long chain carboxylic acids are also known as fatty acid D. The major acidic component of vinegar is formic acid.

49. Which of the following reactions will produce an alkyl carboxylic acid?

A. Heating a methyl ketone with acid and iodine B. Reacting an alkyl halide with hydrogen gas and platinum C. Reacting an alcohol with ozone D. Oxidation of a primary alcohol with hot permanganate or chromate

50. Which one of the following organic molecules has lower boiling point?

A. A alcohol B. Carboxylic acid C. Esters D. Amino acid

51. What is the name of an ester having the molecular formula $C_6H_{12}O_2$?

A. Ethyl butyrate B. Pentyl butyrate C. Ethyl butanoate D. Methyl butyrate

52. Consider the reactions all given below are in gaseous state. For which of the following reactions is K_p less than K_c ? A. $N_2O_4 \leftrightarrow 2NO$ B. $2SO_2 + O_2 \leftrightarrow 2SO_3$ C. $2HI \leftrightarrow H_2 + I_2$ D. $N_2 + O_2 \leftrightarrow 2NO$

53. In which of the following molecules is dispersion force most important?

A. HCl & HBr B. Ne & CH_4 C. $CHCl_3$ & CO D. H_2O & NH_3

54. Which of the following is correct? A. $1L = 1dm^3$ B. $1L = 10dm^3$

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

55. Which one of the following groups in the periodic table has paramagnetic atoms?

A. Group zero B. Group IIA C. Group IIB D. Group IVA

56. In which of the following molecule is the central atom sp^2 hybridized?

A. CO_2 B. N_2O C. CO D. SO_2

57. In a titration of monoprotic acids and bases, there is a large change in pH _____ A. at the point where $pH = pK_a$ of the acid. B. when the volume of acid is exactly equal to the volume of base. C. when the concentration of acid is exactly equal to the concentration of base. D. when the number of moles of acid is exactly equal to the number of moles of base.

58. What is the conjugate acid of $C_6H_5NH_2$?

A. $C_6H_5NH^-$ B. $C_6H_5NH_2^+$ C. $C_6H_5NH_3$ D. $C_6H_5NH_3^+$

59. Which of the following titration possess pH at equivalent point greater than 7?

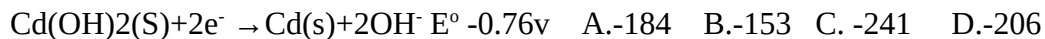
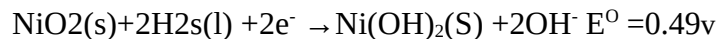
A. Weak base strong acid titration B. Weak acid strong base titration C. Strong base strong acid titration D. Weak acid weak base titration

During the electrolysis of copper(II) sulfate solution, 0.8g of copper was produced at the cathode. What mass of the oxygen was produced at the anode at the same time in the cell?

(A. mass: $O=16$, $Cu=64$, and $1F=96,500C$).

A. 0.2g B. 0.4g C. 0.8g D. 1.6g

60. The two standard electrode potentials involved in the nickel-cadmium rechargeable cell are given below. Calculate the ΔG° in kJ of the cell.



61. Which of the following statements is **correct** about ΔG° , K and E° cell?

A. If K is less than one, ΔG° is negative. B. If ΔG° is zero, K is greater than one. C. If K is greater than one, the ΔG° is negative. D. If a reaction is spontaneous, then ΔG° is positive

62. For clarification of juice, which gas is used?

A) SO_2 B) CO_2 C) H_2S D) Only a and b are correct.

63. is obtained from grapes juice.

A. Beer. B. Wine. C. Whisky. D. Vodka.

64. One of the following is the most common nitrogen based fertilizers.

A. Anhydrous ammonia B. Urea C. urea-ammonium nitrate (UAN) solutions D. all

65. Which one of the following is the most important chemical groups of herbicides? A. chlorophenoxy acids such as 2, 4-D B. organicphosphoruschemicals such as glyphosate; C. amidessuch as alachlor and metolachlor d. all of the above

66. The CaSO_3 formed in the sulphitation process is helpful.....

A. To keep reducing atmosphere.

B. Prevents oxidation.

C. To prevents darkening of juice.

D. All of above.

67. Due to heating, invert sugar turn brown more rapidly than.....

A) Glucose.

B) Fructose.

C) Sucrose.

D) None of these.

68. In sulphitation gas is used.

A) SO_3

B) SO_2

C) CO_2

D) H₂S

69. In Carbonation gas is used.

A) NO₂

B) SO₂

C) CO₂

D) CO

70. The extracted juice is immediately made alkaline by addition of.....

A) NH₃

B) Milk of lime

C) NaOH

D) Na₂CO₃

71. The function of SO₂ in clarification is.....

A) Neutralization excess lime.

B) Bleaches coloring matter.

C) Decreases viscosity of juice.

D) All of above.

72. Defecation is the process of preparation of raw liquor for.....

A) Filtration and clarification.

B) Filtration and evaporation.

C) For settling of juice.

D) None of these

73. Pick out the wrong statement? A. High early strength cements are made from materials having high silica to lime ratio B. The function of gypsum in cement is to enhance its initial

setting rate C. Acid resistant cements are known as silicate cement D. Major component of greyish Portland cement is tricalcium silicate

74. Among the following compounds which one is recycled in Solvay process during the production of Na_2CO_3 A. NaCl B. CO_2 C. NH_3 D. CaCO_3 E. B and C

75. The last step of the Solvay process is A. preparation of ammonical brine B. carbonation C. preparation of carbon dioxide and slaked lime D. recovery of ammonia