

ARADA SUB CITY EDUCATION OFFICE
2016E.C /2024G.C 2ND SEMESTER CHEMISTRY MODEL
EXAMINATION FOR GRADE 12

TIME ALLOWED: 2:30

GENERAL DIRECTIONS

THIS QUESTION PAPER CONTAINS **80 MULTIPLE CHOICE QUESTIONS**,
DEAR STUDENTS ATTEMPT ALL THE ITEMS.

THERE IS ONLY **ONE BEST ANSWER** FOR EACH ITEM, CAREFULLY SELECT
THE BEST ANSWER FROM THE SUGGESTED OPTIONS AND BLACKEN ONLY
THE LETTER OF YOUR CHOICE ON THE SEPARATE ANSWER SHEET
PROVIDED. USE ONLY **PENCIL** TO MARK YOUR ANSWER.

YOU ARE ALLOWED TO WORK ON THE EXAMINATION FOR **2:30 HOURS**. IF
YOU FINISH BEFORE TIME ALLOWED, YOU MAY GO BACK AND REVIEW.
WHEN THE TIME IS CALLED YOU MUST IMMEDIATELY STOP WORKING,
PUT YOUR PENCIL DOWN AND WAIT FOR FURTHER INSTRUCTIONS.

ANY FORM OF CHEATING OR ATTEMPT TO CHEAT IN THE EXAMINATION
HALL RESULT IN AN **AUTOMATIC DISMISSAL** FROM THE EXAMINATION
HALL AND **CANCELLATION** OF YOUR SCORE.

PLEASE MAKE SURE THAT YOU HAVE WRITTEN ALL THE REQUIRED
INFORMATION ON THE SEPARATE ANSWER SHEET PROVIDED.

DO NOT TURN THIS PAGE OVER UNTILL YOU ARE TOLD TO DO SO!

You may refer to the information given below when you work on some of the questions.

PHYSICAL CONSTANTS

Speed of light, $C = 3 \times 10^8 \text{ m/s}$

Planck's constant, $h = 6.626 \times 10^{-34} \text{ J/s}$

Faradays constant, $F = 96500 \text{ C/mol}$

Mass of an electron = $9.11 \times 10^{-31} \text{ Kg}$

Rydberg's constant, $R_H = 2.18 \times 10^{-18} \text{ J}$

ATOMIC NUMBERS (Z) AND ATOMIC WEIGHTS (A)

element	H	B	C	N	O	F	Si	P	S	Cl	Ca	Cr	Ni	Cu	I	Xe
A	1	11	12	14	16	19	28	31	32	35.5	40	52	58.7	63.5	127	131
Z	1	5	6	7	8	9	14	15	16	17	20	24	27	29	53	54

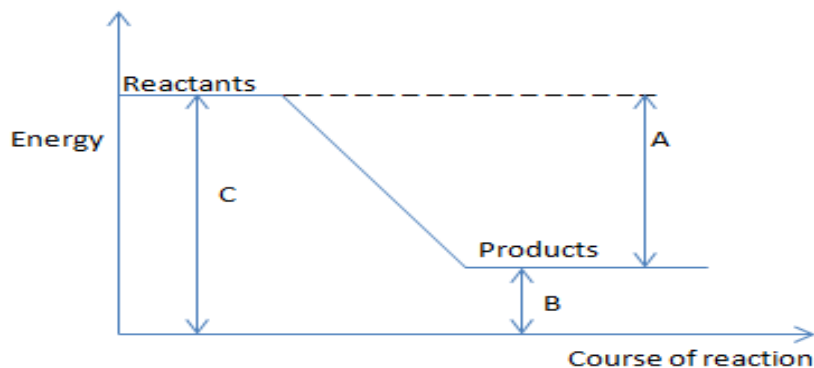
- Which model of an atom describes an atom as a positive sphere where electrons are embedded in a sphere?
 A. Ernest Rutherford B. J.J. Thomson C. Neil's Bohr D. John Dalton
- An element X has two stable naturally occurring isotopes ($^{16}_8\text{X}$ & $^{18}_8\text{X}$). If the average atomic mass of element X is 16.2 a. m. u. what is the percentage abundance of $^{16}_8\text{X}$?
 A. 90 B. 25 C. 10 D. 75
- An element with the electron configuration $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2 4f^7$ is found in
 A. Period – 5 and Group – IIIA C. Period – 5 and Group – IIIB
 B. Period – 6 and Group – VIIA D. Period – 6 and Group – VIIB
- Which of the following property decreases across a period of the periodic table?
 A. Ionization energy C. Effective nuclear charge
 B. Atomic size D. Electron affinity
- Unequal distribution of the shared electrons between two atoms results in the formation of -
 A. Polar covalent bond C. Electrovalent bond
 B. Non-polar covalent bond D. Co-ordinate covalent bond
- Which of the following is non-polar molecule?
 A. NH_3 B. HF C. CCl_4 D. SO_2
- According to Boyle's law, doubling the pressure of a sample of gas, what will be the volume of gas at constant temperature?
 A. Doubled B. Tripled C. Halved D. One third

8. The following table shows substance of comparable molecular mass with their dominant intermolecular forces.

Substance	Dominant intermolecular force
A	Hydrogen bonding
B	London-dispersion force
C	Dipole –dipole force

Which of the following is **FALSE** about the substances?

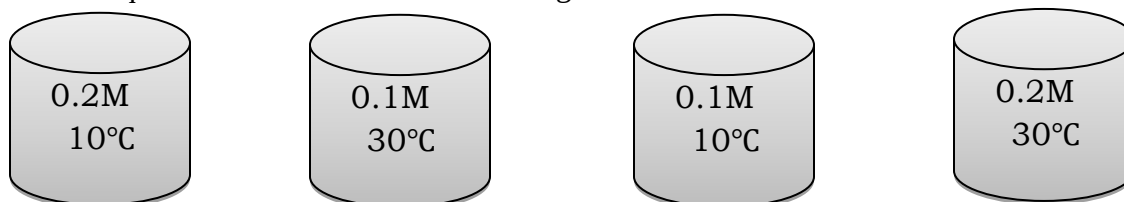
- A. “B” has the weakest intermolecular force attraction
 - B. “C” has the highest boiling point than “A”
 - C. “A” has the strongest intermolecular force attraction
 - D. “C” has the strongest intermolecular than “B”
9. 64g of sulphur dioxide SO_2 is burned in air to produce sulphur trioxide, SO_3 . If the percentage yield of SO_3 is 90%, what is the actual yield of SO_3 ?
- A. 80g
 - B. 72g
 - C. 57.6g
 - D. 160g
10. The following figure shows an energy diagram for a certain chemical reaction



Which of the following is **TRUE** about the reaction shown in the diagram?

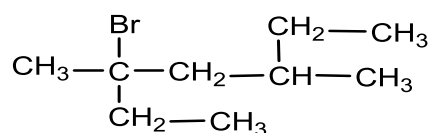
- A. The reaction is endothermic
 - B. ‘C’ indicates heat content of product
 - C. ‘A’ indicates heat change of the reaction
 - D. ‘B’ indicates heat content of reactant
11. If the proportions of reactants in a reaction mixture are non-stoichiometric, which of the following statement is true?
- A. The quantities of the consumed reactant in the reaction maintain stoichiometric proportion
 - B. The amount of yield is proportional to the amount of excess reactant
 - C. The excess reactant is always the one with higher number of moles
 - D. The limiting reactant is the one with less number of moles

12. In an oxidation- reduction reaction, the oxidizing agent is
- reduced as it gains electrons
 - oxidized as it loses electrons
 - contains an element that undergoes oxidation
 - brings about reduction but itself oxidized
13. In each of the four beakers shown below, a 2.0cm strip of magnesium ribbon is added to 100mL of aqueous solution of HCl under the given condition shown



- In which beaker will the reaction occur at the fastest rate? In the beaker that contains
- 0.1M at 30°C
 - 0.2M at 30°C
 - 0.1M at 10°C
 - 0.2M at 10°C
14. The quantity of heat required to convert one mole of a solid into its liquid state is
- Molar heat of condensation
 - Molar heat of fusion
 - Molar heat of crystallization
 - Molar heat of sublimation
15. Given the reaction at equilibrium: $X_{2(g)} + 2Y_{2(g)} \rightleftharpoons 2XY_{2(g)} + \text{heat}$
- How the equilibrium reaction does yields high amount of product?
- By increasing both the temperature and pressure
 - By decreasing the temperature and increasing pressure
 - By increasing the temperature and decreasing pressure
 - By decreasing both the temperature and pressure
16. Two gases A and B were applied to the two ends of 40 cm long glass tube. The two gases met at a distance of 30 cm from the side where B is applied. Which statement is true about these gases?
- The density of A is smaller than the density of B
 - The rate of diffusion of A is faster than the rate of diffusion of B
 - The molar mass of A is higher than the molar mass of B
 - The rate of diffusion of B is slower than the rate of diffusion of A
17. Which set of compounds represents a homologous series?
- C_2H_6 , C_3H_8 , C_4H_{10}
 - C_2H_6 , C_3H_8 , C_4H_6
 - C_2H_6 , C_3H_8 , C_5H_{10}
 - C_2H_6 , C_3H_8 , C_4H_8
18. Which one of the following is a tertiary alcohol?
- 3-Hexanol
 - 2-methyl-2-pentanol
 - 1,2,3-propanetriol
 - 2-methyl-2-propanol

19. What is the correct IUPAC name of the compound shown below?



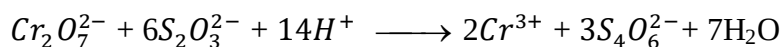
- A. 2-bromo-2,4-diethylpentane C. 3-bromo-5-ethyl-3-methylhexane
 B. 3-bromo-3,5-dimethylheptane D. 2-bromo-2-ethyl-4-methylhexane
20. A reaction for the general preparation for a member of homologous series of a certain hydrocarbon is given by: $\text{R-CH (Cl)-CH}_2\text{ (Cl)} + 2\text{KOH} \rightarrow \text{Y} + 2\text{KCl} + 2\text{H}_2\text{O}$; "Y" in these equation represents:
- A. $\text{R-CH}_2\text{-CH}_3$ B. R-CH=CH_2 C. $\text{R-CH}_2\text{-CH}_2\text{-OH}$ D. $\text{R-C}\equiv\text{CH}_2$
21. Which of these statements is **FALSE** about the identification test of saturated and unsaturated hydrocarbons?
- A. Br_2 in CCl_4 is used to identify whether the compound is saturated or not.
 B. The consumption of hydrogen gas (H_2) by the compound to be tested can be used as reagent for the existence of unsaturated hydrocarbon or not
 C. The reagent KMnO_4 (Alkaline) can be used to test unsaturated hydrocarbon
 D. The reagent nitric acid (HNO_3) can be used to test unsaturated hydrocarbon
22. Alcohol that yield ketones on oxidation are classified as;
- A. Dihydric alcohol B. Trihydric alcohol C. Primary alcohol D. Secondary alcohol
23. Which one of the following is **Not** a ternary acid?
- A. HCN B. HF C. HNO_3 D. H_3PO_2
24. When an acid reacts with an active metal:
- A. hydronium ion concentration increases C. the metal forms anions
 B. hydrogen gas is produced D. carbon dioxide gas is produced
25. What is the $[\text{OH}^-]$ of a solution with a pH of 4?
- A. 10^{-4} B. 10^4 C. 10^{10} D. 10^{-10}
26. Which one of the following salts is not an acidic salt?
- A. KHSO_4 B. Na_2HPO_4 C. $(\text{NH}_4)_2\text{SO}_4$ D. $\text{Mg}(\text{HCO}_3)_2$
27. During the electrolysis of molten lead bromide using graphite electrodes, the anode reaction is
- A. $2\text{Br}^- \longrightarrow \text{Br}_2 + 2e^-$ C. $\text{Br}_2 + 2e^- \longrightarrow 2\text{Br}^-$
 B. $\text{Pb} \longrightarrow \text{Pb}^{+2} + 2e^-$ D. $\text{Pb}^{+2} + 2e^- \longrightarrow \text{Pb}$
28. As opposed to a galvanic cell, in an electrolytic cell
- A. spontaneous redox reaction generates electricity C. the anode is positive
 B. electrons flow from cathode to anode D. oxidation takes place at the cathode

29. In the extraction of aluminum from bauxite, bauxite is treated with hot aqueous sodium hydroxide. The reason for this is to
- lower the melting point of bauxite
 - increase the strength of aluminum
 - displace aluminum from its oxide
 - remove impurities from bauxite
30. Which of the following is the purest form of iron?
- Cast iron
 - wrought iron
 - Pig iron
 - limonite
31. Which of the following methods is used to reduce land pollution?
- Replacing CFCs by less harmful alternatives
 - Removal of lead compounds from gasoline
 - Reducing CO₂ emission
 - Recycling plastics
32. In the process of converting skin to leather by tanning, the use of slaked lime is to
- make sole leather
 - remove the hairs
 - kill bacteria and dehydrate
 - soften the skin and hide
33. Precision refers to how close a measured value to
- the true value
 - the other measured values
 - zero
 - the calculated value
34. Which of the following represents a tentative explanation of a certain scientific law?
- Hypothesis
 - Observation
 - Experimentation
 - Theory
35. Which of the following electron transitions requires the highest energy to be absorbed by the hydrogen atom?
- from $n = 1$ to $n = 2$
 - from $n = 3$ to $n = 4$
 - from $n = 2$ to $n = 3$
 - from $n = 4$ to $n = 5$
36. Which one of the following quantum numbers determines the orientation of atomic orbitals?
- Principal quantum number
 - Spin quantum number
 - Azimuthal (angular) quantum number
 - Magnetic quantum number
37. Within a specified period, an increase in atomic number's usually accompanies:
- an increase in atomic radius and an increase in electronegativity
 - a decrease in atomic radius and an increase in electronegativity
 - an increase in atomic radius and a decrease in electronegativity
 - a decrease in atomic radius and a decrease in electronegativity
38. Which one of the following is an example of ionic compounds?
- NH₃
 - CCl₄
 - NH₃BF₃
 - CaF₂
39. Which of the following molecules violate octet rule?
- SiCl₄
 - O₃
 - SF₄
 - SO₃
40. If a molecule has Trigonal bipyramidal electron pair arrangement and T-shape molecular geometry, how many non-bonding pair of electrons is present in the valence shell of the central atom?
- 1
 - 2
 - 3
 - 0

41. Which reaction involves a change in the hybridization state of the underlined atom?
- A. $2\text{S}\underline{\text{O}}_2 + \text{O}_2 \longrightarrow 2\text{S}\underline{\text{O}}_3$ C. $\text{H}_2\underline{\text{O}} + \text{H}^+ \longrightarrow \text{H}_3\underline{\text{O}}^+$
 B. $\text{B}\underline{\text{F}}_3 + \text{F}^- \longrightarrow \text{B}\underline{\text{F}}_4^-$ D. $\text{N}\underline{\text{H}}_3 + \text{H}^+ \longrightarrow \text{N}\underline{\text{H}}_4^+$
42. At certain point a reaction: $2\text{A} \longrightarrow 3\text{B}$, $[\text{A}]$ drops from 0.4M to 0.2M in 10minutes. What is the average rate of B during this time interval?
- A. 0.03M min^{-1} B. 0.02M min^{-1} C. 0.01M min^{-1} D. 0.06M min^{-1}
43. What is the half-life, $t_{1/2}$, for a zero order reaction: $\text{A} \rightarrow \text{B}$, (k is rate constant)?
- A. $\frac{[\text{A}]_0}{2k}$ B. $\frac{0.693}{k}$ C. $\frac{1}{k[\text{A}]_0}$ D. $\frac{3}{2k[\text{A}]_0}$
44. For the reaction $2\text{A}_{(\text{g})} + \text{B}_{(\text{g})} \rightleftharpoons 3\text{C}_{(\text{g})}$ at 200°C , the equilibrium constant is 3.0. If $[\text{A}] = 2.0\text{M}$, $[\text{B}] = 3\text{M}$ and $[\text{C}] = 4.0\text{M}$. Which of the following is correct?
- A. The system is at equilibrium C. The system shifts towards the right
 B. The values of $Q_c < K_c$ D. The system shifts towards the left
45. What is the relationship between K_c and K_p for the reaction
 $3\text{A}_{(\text{g})} \rightleftharpoons \text{B}_{(\text{g})} + \text{C}_{(\text{g})}$
- A. $K_p = K_c(RT)^1$ B. $K_p = K_c(RT)^{-1}$ C. $K_p = K_c(RT)^2$ D. $K_p = K_c(RT)^{-2}$
46. What is the general formula of saturated monocarboxylic acids
- A. $\text{C}_n\text{H}_{2n+1}\text{O}$ B. $\text{C}_n\text{H}_{2n}\text{O}$ C. $\text{C}_n\text{H}_{2n+2}\text{O}_2$ D. $\text{C}_n\text{H}_{2n}\text{O}_2$
47. What is the process that converts vegetable oils to solid fats?
- A. Hydration B. Hydrogenation C. Hydrolysis D. Saponification
48. What is the parent acid and alcohol to prepare isopropyl pentanoate?
- A. $\text{CH}_3-\underset{\text{OH}}{\text{CH}}-\text{CH}_3$ & $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{OH}$
 B. $\text{CH}_3-\underset{\text{OH}}{\text{CH}}-\text{CH}_3$ & $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}_2-\overset{\text{O}}{\underset{\text{O}}{\text{C}}}-\text{OH}$
 C. $\text{CH}_3-\text{CH}_2-\text{CH}_2\text{OH}$ & $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}_2-\overset{\text{O}}{\underset{\text{O}}{\text{C}}}-\text{OH}$
 D. $\text{CH}_3-\text{CH}_2-\text{CH}_2\text{OH}$ & $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2-\overset{\text{O}}{\underset{\text{O}}{\text{C}}}-\text{OH}$
49. Which one of the following is not an amphiprotic species?
- A. HPO_4^{2-} B. H_2O C. NH_3 D. HNO_2
50. For the reaction below, which pair of species are both bases?
- $\text{HCN} + \text{H}_2\text{O} \rightleftharpoons \text{H}_3\text{O}^+ + \text{CN}^-$
- A. HCN & CN^- B. H_3O^+ & H_2O C. HCN & H_3O^+ D. H_2O & CN^-
51. What is the pH of a 0.01M weak base, B solution? $K_b = 1.6 \times 10^{-9}$
- A. 8.6 B. 5.6 C. 4 D. 6

52. The concentration of hydroxide in a solution in which the concentration of hydroxide ion is 100 times hydronium ion at 25°C is -----
- A. 1.0×10^{-5} B. 1.0×10^{-6} C. 1.0×10^{-8} D. 1.0×10^{-9}
53. The PH of 0.1M solution of weak acid is 3.0. What is the value of the ionization constant for the acid?
- A. 10^{-5} B. 10^{-6} C. 10^{-8} D. 10^{-10}
54. A buffer solution a mixture of
- A. a weak acid and a strong acid C. a weak acid and its conjugate base
B. a strong acid and its conjugate base D. a strong acid and its conjugate acid
55. To 0.2 M solution of a weak monoprotic acid, HA, enough quantity of its sodium salt, NaA, was dissolved to give a concentration of 0.2 M of the salt. What will be the acid concentration, $[H_3O^+]$, in the final solutions? (K_a of HA = 1.80×10^{-5})
- A. 3.60×10^{-6} M B. 1.80×10^{-5} M C. 1.00×10^{-5} M D. 1.90×10^{-3} M
56. Why salts of weak acid and strong base give a basic solution? because the
- A. The cations derived from a strong base can hydrolyzed
B. The anions derived from a strong base can hydrolyzed
C. The cations derived from a weak acid can hydrolyzed
D. The anions derived from a weak acid can hydrolyzed
57. Which of the following statements is true?
- A. A universal indicator is a mixture of indicators that will give a different colour for a different pH.
B. Phenolphthalein is a universal indicator
C. A universal indicator can only be used in either strongly acidic or basic solution.
D. The colour of a universal indicator is red in a weak acid.
58. Which of the following titrations will have an equivalence point at a pH < 7?
- A. Strong acid with weak base C. Weak acid with weak base
B. Strong acid with strong base D. Weak acid with strong base
59. In titration of acids and bases, the point at which stoichiometrically equal amounts of substances have been brought together is
- A. End point C. Equivalence point
B. Standard point D. common ion
60. The species that being reduced and causes oxidation is a/an
- A. Reduction B) Reducing agent C) Oxidation D) Oxidizing agent

61. Which substances is reduced in the following reaction



- A. H^+ B) Cr^{3+} C) $\text{S}_2\text{O}_3^{2-}$ D) $\text{Cr}_2\text{O}_7^{2-}$

62. What is the difference between metallic conduction and electrolytic conduction?

- A. Metallic conduction involves transfer of matter in the form of ions, whereas electrolytic conduction does not involves transfer of matter.
- B. In metallic conduction passage of charge brings about physical and chemical changes, whereas electrolytic conduction brings about only physical changes.
- C. In metallic conduction electrical charge is carried by electrons, whereas in electrolytic conduction electrical charge is carried by ions.
- D. In metallic conduction the ions are able to move in the solution, whereas in electrolytic conduction delocalized valence electrons are able to move in the solution

63. What are the expected products of the electrolysis of an aqueous solution of CuSO_4 using an inert electrode?

- A. Cu and H_2 at the cathode and dissolving of Cu at the anode
- B. Cu at the cathode and O_2 at the anode only
- C. Cu and H_2 at the cathode and only O_2 at the anode
- D. Cu at the cathode, O_2 at the anode and H_2SO_4 solution

64. In the electroplating of nickel from a solution containing Ni^{2+} ion, what will be the weight of the metal deposited on the cathode by a current of 8 A flowing for 500 minutes?

- A. 73 g B. 103 g C. 117.4 g D. 145 g

65. A 1M solution of $\text{Cu}(\text{NO}_3)_2$ is placed in a beaker with a strip of Cu metal. A 1M of SnSO_4 is placed in a second beaker with a strip of Sn metal. The two beakers are then connected by a salt bridge and the two metal electrodes are connected by wires to a voltmeter. Which of the following electrode serves as the anode and which electrode gains mass? Given that $E^\circ \text{Cu}^{2+}/\text{Cu} = 0.34\text{V}$ and $E^\circ \text{Sn}^{2+}/\text{Sn} = -0.14\text{V}$

- A. Sn, Sn electrode gains mass C. Sn, Cu electrode gains mass
- B. Cu, Sn electrode gains mass D. Cu, Cu electrode gains mass

66. Which of the following is **WRONG** concerning a Galvanic cell?

- A. It involves the deposition of one metal at one electrode when oxidations of another metal occur at the second electrode.
- B. A spontaneous chemical reaction generates an electric current
- C. A non-spontaneous chemical reaction generates electrical energy
- D. It does not require an external source of electric current to function

67. For the electrochemical cell represented by: $\text{Zn(s)}/\text{ZnSO}_4(\text{aq}) // \text{CuSO}_4(\text{aq})/\text{Cu(s)}$.

The standard reduction potentials for Cu^{2+}/Cu and Zn^{2+}/Zn are + 0.34 and – 0.76V, respectively. What will be the cell reaction that occurs spontaneously and its cell voltage?

- | | $E^\circ(\text{V})$ |
|--|---------------------|
| A. $\text{Cu} + \text{Zn}^{2+} \longrightarrow \text{Cu}^{2+} + \text{Zn}$ | 1.10 |
| B. $\text{Zn} + \text{Cu}^{2+} \longrightarrow \text{Zn}^{2+} + \text{Cu}$ | 0.42 |
| C. $\text{Cu}^{2+} + \text{Zn}^{2+} \longrightarrow \text{Zn} + \text{Cu}$ | 0.42 |
| D. $\text{Cu}^{2+} + \text{Zn} \longrightarrow \text{Cu} + \text{Zn}^{2+}$ | 1.10 |

68. Which of the following statement describe Chemical industries? It is :

- A. A process in which dissolved solute comes out of solution and form crystals
- B. An area of chemistry concerned with the rate at which chemical reaction occur
- C. A firm that involves the usage of raw material to form desired products by means of chemical reaction
- D. An expression for the chemical composition of compound.

69. Which of the following is a non-renewable resource:

- A. soil B. petroleum C. water D. plants

70. Which of the following is the most important ingredients used for production of DAP.

- A. Ammonia and phosphoric acid C. Nitric acid and urea
B. Phosphoric acid, urea and ammonia D. Sulphuric acid, ammonia and urea

71. The hydrogen used in Haber process is made by the following reaction

$\text{CH}_4 + \text{H}_2\text{O} \rightleftharpoons \text{CO} + 3\text{H}_2, \Delta H = +206\text{KJ}$. Which of the following set of condition will favor the formation of more H_2 Molecules?

- A. Low pressure and high temperature C. Low pressure and low temperature
B. High pressure and high temperature D. High pressure and low temperature

72. Ammonia is produced in laboratory by heating ammonium chloride with ____.

- A. Calcium nitrate B. Calcium hydroxide C. Calcium chloride D. Calcium sulphate

73. Among the following compounds which one is a by-product in Solvay process during the production of Na_2CO_3 ?

- A. CaCl_2 B. CO_2 C. NH_3 D. CaCO_3

74. Which of the following pairing is not correct?

- A. Solvay process- NaCl C. Contact process- H_2SO_4
B. Ostwald process- HNO_3 D. Haber process- NH_3

75. What is the purpose of adding ethanol during the preparation of soap?
- A. To reduce the solubility of soap & separate it out C. To make soft and smooth
B. To dissolve the fat & make hydrolysis easily D. to make pleasant smell
76. The major composition of cement is
- A. SiO_2 B. CaO C. Fe_2O_3 D. Al_2O_3
77. The purpose of annealing during glass production is _____.
- A. changing into required shapes C. testing the quality of glass
B. melting the raw material D. removing internal stress
78. The stage in which the shredded sugarcane travels on the conveyor belt through a series of heavy-duty rollers, which extract juice from the pulp in sugar manufacturing, is called_____.
- A. Juicing B. Cleansing and Grinding C. Collecting the Harvest D. Clarifying
79. In the process of sugar manufacturing which one of the following substance is used to bleach the brown syrup?
- A. Sodium hypochlorite B. Sulfur dioxide C. Hydrogen peroxide D. Chlorine
80. Of the following methods, which one is a traditional food preservation method?
- A. Vacuum packing B. Freeze drying C. Salting D. Freezing

~End~