2017
MATRICULATION EXAMINATION
DEPARTMENT OF MYANMAR EXAMINATION

CHEMISTRY   **Time Allowed: 3 Hours**
WRITE YOUR ANSWERS IN THE ANSWER BOOKLET
The symbols in this paper have their usual significance

SECTION (A)
(Answer ALL questions)

1. Write **TRUE** or **FALSE** for each of the following statements.   **(7 marks)**
   (a) The equivalence point in a titration is a theoretical concept.
   (b) A reducing agent is an acceptor of electrons.
   (c) Electrical energy produced from a motor.
   (d) Atoms of the same element that have the same number of neutrons.
   (e) Monoclinic sulphur is the most stable form of sulphur.
   (f) Rusting is the most common form of corrosion.
   (g) The process of neutralization occurs by the reaction of hydrogen and hydroxide ions.

2. Fill in the blanks with the correct word(s), phrase(s), term(s), unit(s), etc.,   **(7 marks)**
   as necessary.
   (a) The rate of reaction is inversely proportional to the ---------- taken.
   (b) Sodamide is decomposed by water to regenerate ---------- gas.
   (c) Fluorine never shows the positive ---------- number.
   (d) IUPAC name of tertiary butyl alcohol is ----------.
   (e) Variation of temperatures can affect the ---------- and volume of the gas.
   (f) Electroplating is the electrical --------- of one metal to another.
   (g) Lead is used as a shield against ---------- material and x-rays.

3. Select the correct word(s), notation(s), term(s), unit(s), etc., given   **(7 marks)**
   in the brackets.
   (a) Methane is produced from [biomass ; coal gas ; coke] when it decays in the absence
   of air.
   (b) Over use of [humus; manure; chemical] fertilizer changes the acidity of soil.
   (c) The iron ore is reduced by [carbon monoxide; hydrogen; chlorine].
   (d) [Cl_2; Br_2; I_2] is a liquid at room temperature.
   (e) [Fluorine; Chlorine; Bromine] has the highest electron affinity.
   (f) [ΔH^θ ; ΔH; H] is the symbol of standard enthalpy change.
   (g) Enzyme is a (an) [biocatalyst; inhibitor; intermediate].

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4. Match each of the items in **List A** with the appropriate items given in **List B**.   **(7 marks)**

List A	List B
(a) Ammonium chloride aqueous solution	(i) appears as the brown ring
(b) The volume of the gas will become zero	(ii) amphoteric
(c) Anhydrous sodium carbonate	(iii) weak acid
(d) H_2SO_3	(iv) -273° C
(e) $FeSO_4$. NO	(v) the solution to be acidic
(f) Lead (II) oxide	(vi) removal of hydrogen from a substance
(g) Oxidation	(vii) primary standard

5. Define the following: **(8 marks)**
   - (a) Standard solution
   - (b) An oxidizing agent
   - (c) Hess's Law of constant heat summation
   - (d) Nucleus
   - (e) A concentrated acid
   - (f) Electrochemical series
   - (g) Activation energy
   - (h) Fertilizers

SECTION (B)

6. Answer **ALL** questions.   **(12 marks)**

   (a) Write balance equation in words and symbols for the reaction of sulphur and concentrated nitric acid.

   (b) Why does common salt become damp when it is exposed to the air?

   (c) Explain why nitric acid cannot be used for the preparation of hydrogen sulphide in the laboratory.

   (d) Summarize the effect of pressure on gaseous systems.

   (e) Write the structural formulae and give IUPAC name of the isomers of butene (C_4H_8).

   (f) Give each example of the endothermic reaction and exothermic reaction.

7. Answer any **FIVE** questions.   **(20 marks)**

(a) (i) Arrange the following elements in order of their increasing atomic radious.
$_9F, _6C , _8O, _7N$

   (ii) Select the one which of the following groups has the largest ionization energy.
   (A) 2.8.1, (B) 2.8.5 (C) 2.8.7

   (iii) Write down the electron dot-cross structure of PF_5.

   (iv) Give the position in the periodic table of element $_{13}Al$.

(b) A certain mass of gas occupies 942 cm^3 at 22° C. At what temperature in ° C will the gas occupy 311 cm^3 under the same pressure?

(c) On passing a steady current of 0.75 A for 25 minutes through a copper (II) sulphate solution, 0.369g of copper is deposited. Calculate the relative atomic mass of copper. (One Faraday = 96500 coulombs)

(d) Balance the following redox reactions using either oxidation number method or ion electron (half reaction) method.
   (i) $Mg + NO \rightarrow MgO + N_2$
   (ii) $BrO_3^- + I^- + H^+ \rightarrow Br^- + I_2 + H_2O$

(e) (i) Define " a positive catalyst " and "reversible reaction".

   (ii) Using Le Chatelier's principle, predict the effect of decreasing the temperature of the following equilibrium system.
   $2 CO (g) + O_2 (g) \rightarrow 2CO_2 (g) + heat$

(f) (i) Give the name and formula of a common ore of iron.

   (ii) Write balanced equation in words and symbols for the following reaction.
   Aqueous solution of iron (III) chloride reacts with aqueous solution of sodium hydroxide.

(g) Give equation in words and symbols each in which ammonia react with
   (i) excess chlorine   (ii) sodium metal heated to red heat.

(h) (i) What is the long form of the following substances and mention their uses.
   (A) IAA   (B) BHC

   (ii) Which element N or P or K is most suitable for growing cabbage? Give reasons.

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8. Answer any **FOUR** questions. **(32 marks)**

(a) (i) Explain the terms " a neutral aqueous solution" and "an amphiprotic molecule".

(ii) Calculate the pH of a buffer solution containing 0.2 mol of ethanoic acid $(K_a = 1.8x\ 10^{-5})$ and 0.1 mol of sodium ethanoate per dm^3.

(b) (i) Define 'heat of combustion'.

(ii) Calculate the heat of formation of oxalic acid, $C_2H_2O_4$ (s), if its heat of combustion is - 827 kJ mol^{-1}. The heat of combustion of carbon graphite and hydrogen are $- 393$ kJ mol^{-1} and $- 286$ kJ mol^{-1} respectively.

(c) (i) What products would you expect when CH_3COONa is heated with soda-lime?

(ii) Illustrate the preparation of ethanol from glucose.

(iii) How would you obtain ethanal from ethyne?

(iv) How does ethene react with hydrogenchloride?

(d) (i) How would you distinguish between ethane and ethene?

(ii) A gas "X" is obtained by treating calcium carbide with water. What is gas "X" ? Write down the chemical equation.

(iii) Name the chemicals which can be obtained from coal and mention their uses.

(iv) How do you obtain Gasoline from methanol?

(e) Describe the Manufacturing of sulphuric acid by Contact Process.

(f) Write the balanced equations (**words and symbols**) for the laboratory preparations of bromine and nitrogenoxide gases. (Any **one method** for each gas)
State the collection methods and their respective reasons.

(g) 25 cm^3 of 0.1M sodium carbonate solution required 24 cm^3 of sulphuric acid to neutralize it.

(i) Calculate the molar concentration of sulphuric acid.

(ii) What volume of water should be added to 24 cm^3 of sulphuric acid so that the concentration becomes exactly 0.1M ?

(h) Describe the extraction of silver from silver glance by the cyanide process.

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