

2015

**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) Molarity represents the quantity in millimoles of solute per cm^3 of solution.
 - (b) Particles of gas are always in constant and rapid motion.
 - (c) An exothermic process may be used as a cooling system .
 - (d) All elements in the free state have an oxidation number one.
 - (e) The shell nearest to the nucleus has highest energy.
 - (f) Electrolytes can conduct electricity due to the movement of atom.
 - (g) A small quantity of catalyst is sufficient to catalyze the reaction of a large quantity of reaction.

2. Fill in the blanks with the correct word(s), phrase(s), term(s), unit(s), etc., **(7 marks)** as necessary.
 - (a) ----- gas can be prepared by heating a solution of ammonium nitrite.
 - (b) Chlorine is a greenish yellow gas with a -----, unpleasant smell.
 - (c) The alkanes are relatively ----- towards other chemical reagents.
 - (d) The position of the alkali metals are ----- in the electrochemical series.
 - (e) Removal of impurities from pig iron gives ----- iron.
 - (f) Sulphur can exist in different ----- forms like carbon and oxygen.
 - (g) If pure water contained no ions, the electrical conductivity would be -----.

3. Select the correct word(s), notation(s), term(s), unit(s), etc., given **(7 marks)** in the brackets.
 - (a) [Insecticides ; Lime; Urea] is used to neutralize the soil acid.
 - (b) A catalyst changes [the rate of reaction; concentration of product; frequents of collision].
 - (c) An electrochemical reaction is a [redox; catalytic; electron transferring] reaction .
 - (d) Cation is [reduced ; neutralized ; oxidized] at the cathode.
 - (e) Methyl orange gives [yellow ; colourless ; red] colour with alkali solutions.
 - (f) The force acting on unit [length ; area; volume] is the gas pressure.
 - (g) The atom with the octet structure is [hydrogen ; helium ; neon].

[P.T.O.]

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

List A

- (a) Neutralization
- (b) Sulphuric acid
- (c) Chile salt-petre
- (d) Antiseptic properties of iodine
- (e) Rust
- (f) Ethanoic acid
- (g) Nitrogen

List B

- (i) sodium nitrate
- (ii) due to oxidizing
- (iii) orange red powder
- (iv) use in the manufacture of ammonia
- (v) to form a salt and water
- (vi) act as a dehydrating agent
- (vii) organic weak acid

5. Define the following: (8 marks)

- (a) An electropositive element
- (b) Relative density of gas
- (c) Formula mass
- (d) Electrolysis
- (e) Reducing agent
- (f) An enzyme
- (g) Enthalpy change
- (h) Water neutrality

SECTION (B)

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

- (a) Give the maximum number of electrons in L shell and M shell.
- (b) What are the measurable quantities of gas?
- (c) State Faraday's second law of electrolysis.
- (d) Determine the oxidation numbers of chlorine in HClO_4 , Cl_2 , NaClO_4 and KClO_3 .
- (e) Write the balanced equation in words and symbols for the reaction of sulphur and sodium hydroxide.
- (f) What are fertilizers? Write the names of the important potassium fertilizers.

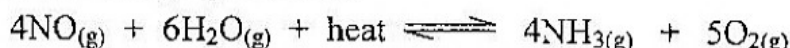
7. Answer any **FIVE** questions. **(20 marks)**

(a) What volume of 1.0 M sulphuric acid is required to react with 5.0 g of zinc.

$$[\text{Zn} = 65.4]$$

(b) (i) Explain the terms forward reaction and reverse reaction.

(ii) Using Le Chatelier's principle, predict the effect of decreasing the temperature on the following equilibrium.



(c) Write down the

(i) essential electronic structure

(ii) position in the periodic table

(iii) the chief valence

(iv) type of the element of ${}_{19}\text{X}$.

(d) Describe equation in words and symbols each in which nitric acid acts as

(i) an acid

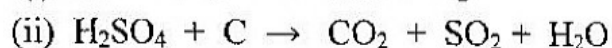
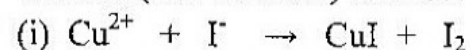
(ii) an oxidizing agent

(e) What mass of silver and what volume of oxygen will be liberated at STP during electrolysis by a charge of 48250 coulomb? [$\Delta\text{g} = 108$, one Faraday = 96500C]

(f) (i) Name the methods used to prevent iron rusting.

(ii) Write balance equations (symbol only) for the reactions of sodium peroxide with water and with carbondioxide.

(g) Balance the following redox reactions using either oxidation number method or ion electron (half reaction) method.



(h) (i) What are the chief compounds present in cement?

(ii) Write an overall equation for photosynthesis.

8. Answer any **FOUR** questions.

(32 marks)

- (a) (i) Explain the terms “strong” and “weak” as applied to acids.
 (ii) Calculate the pH of an aqueous solution containing 8.0 g of sodium hydroxide per dm^3 . [Na = 23, O = 16, H = 1]
- (b) (i) Explain the term Chemical Energetics. Will the temperature of the surrounding air increase or decrease, if an endothermic reaction is allowed to occur in air?
 (ii) Calculate the heat of formation of dimethyl ether ($\text{CH}_3\text{-O-CH}_3$), if its heat of combustion is -1368 kJmol^{-1} . The heat of formation of CO_2 and H_2O are -393 kJmol^{-1} and -286 kJmol^{-1} respectively.
- (c) (i) What happens when ethanol reacts with hydrochloric acid in the presence of anhydrous zinc chloride?
 (ii) Write relevant equation in words and symbols to illustrate dehydrogenation of alcohol.
 (iii) Write an equation for hydration of propyne.
 (iv) What product would you expect from the addition of bromine to 1-butene?
- (d) (i) Distinguish between propene and propyne.
 (ii) A gas “X” is formed by heating sodium propanoate with soda lime. What is gas “X”? Write down the chemical equation.
 (iii) How would you understand by the term catalytic cracking?
 (iv) Explain the term flash point.
- (e) Describe the manufacturing of ammonia by Haber Process.
- (f) Describe the laboratory preparation of sulphur dioxide with a labelled diagram.
- (g) 125 cm^3 of hydrochloric acid were diluted to 1.5 dm^3 with distilled water. 20 cm^3 of this diluted acid is required to neutralize 25 cm^3 of 0.5 M sodium carbonate solution. What is the concentration in gdm^{-3} of the original acid?
 [H=1, Cl= 35.5, Na=23, C=12, O=16]
- (h) Write a process for the extraction of copper from copper pyrites.
