

**2019(Sample)**  
**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) Electrovalent compounds are gases or volatile liquids.
  - (b) The amount of solvent does not change due to dilution.
  - (c) Faraday's laws express only the qualitative results of electrolysis.
  - (d) Heat is evolved when a substance is burned in oxygen.
  - (e) Alkali metals are easily inflammable when they touch to kerosene.
  - (f) There are various types of steel that differ only in their carbon content.
  - (g) Nitrogen is present as major constituent in the atmosphere.
  
2. Fill in the blanks with the correct word(s), phrase(s), term(s), unit(s), etc., **(7 marks)**  
as necessary.
  - (a) A 11.0 g of a gas occupies 5.6 dm<sup>3</sup> at STP, so that the molar mass of it is \_\_\_\_\_.
  - (b) Sulphates are normal \_\_\_\_\_ of sulphuric acid.
  - (c) Starch solution is used to test the presence of \_\_\_\_\_.
  - (d) The exteriors of refrigerators are coated with \_\_\_\_\_ to prevent the steel structure rusting.
  - (e) Addition of halogen acids to alkenes is also called \_\_\_\_\_.
  - (f) Oxidation number of nitrogen in ammonia is \_\_\_\_\_.
  - (g) Soil supplies \_\_\_\_\_ and other elements to plants.
  
3. Select the correct word(s), notation(s), term(s), unit(s), etc., given **(7 marks)**  
in the brackets.
  - (a)  $\text{H}_2(\text{g}) + \text{Cl}_2(\text{g}) \xrightleftharpoons{h\nu} 2\text{HCl}(\text{g})$  is a [photosynthesis; photochemical; light catalyzed] reaction.
  - (b) In silver plating, [silver deposits; silver dissolves; oxygen evolves] at the anode.
  - (c) Sodium carbonate is also called [baking soda; soda ash; rock salt].
  - (d) POP is composed as [ $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ;  $\text{CaSO}_4 \cdot \text{H}_2\text{O}$ ;  $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$ ].
  - (e) A volume of gas [expands; contracts; unchanges] when compressed.
  - (f) Hydrogen ion is [electron deficient; electron efficient; single electron] ion.
  - (g) Oxidation number of hydrogen in metallic hydride is [zero; +1; -1].

**[P.T.O.]**

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

<b>List A</b>	<b>List B</b>
(a) Magnetite	(i) Saliva
(b) Polyester	(ii) Nitroso iron(II)sulphate
(c) Magnesite	(iii) C <sub>10</sub> H <sub>16</sub>
(d) Ptyalin	(iv) Catalyst
(e) Turpentine	(v) Triiron tetroxide
(f) ZSM-5	(vi) Magnesium carbonate
(g) Brown-ring	(vii) Terylene

5. Define the following: **(8 marks)**
- (a) Copolymer
  - (b) Intermediate state
  - (c) Electron affinity
  - (d) Diffusion
  - (e) One faraday
  - (f) Standardization
  - (g) Standard enthalpy change
  - (h) Thermit reaction

### SECTION (B)

6. Answer **ALL** questions. **(12 marks)**
- (a) Write down the general formulae of each of the following organic compounds containing **SIX** hydrogen atoms respectively.  
Alkane ; Alkene ; Alkyne ; Alcohol
  - (b) A 500 cm<sup>3</sup> of nitrogen oxide gas diffuses through a porous pot in 50 s. How long will the same volume of ethene gas diffuse through the same pot?  
(C = 12, H = 1, O = 16, N = 14)
  - (c) What type of polymerization would CH<sub>3</sub>-CH=CH<sub>2</sub> undergo? Write down the equation.
  - (d) Give two examples which deviate octet rule and write down their dot-cross structures.
  - (e) What will be the volume of ammonia gas when 75 cm<sup>3</sup> of hydrogen and 25 cm<sup>3</sup> of nitrogen are completely mixed? (All gases are measured at the same condition)
  - (f) A solution of copper(II) sulphate was divided into two portions. One portion was electrolysed by using platinum electrodes and the other by using copper electrodes. What changes in colour of the solution do you expect in each case?

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

(a) Two types of compounds **Y** and **Z** can be formed from elements  ${}_{15}\text{A}$  and  ${}_{17}\text{B}$ . Write down the following:

(i) the formulae of **Y** and **Z**

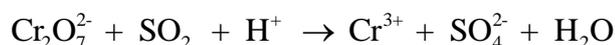
(ii) type of bond existing in **Y** and **Z**

(iii) the complete chemical equation (in **words and symbols**) for the reaction of **Y** or **Z** with ethanol.

(b) A 0.2 g of a gas occupies a volume of  $185 \text{ cm}^3$  measured over water at 756 mmHg and  $22^\circ\text{C}$ . Vapour pressure of water at  $22^\circ\text{C}$  is 21.3 mmHg. What is the approximate molecular mass of the gas?

(c) A current of 1 A is passed through a solution of 0.1 M copper(II) sulphate solution using copper electrode. How long would a current of 1 A need to pass the cell, so as to deposit 0.0635 g of copper? (1 F = 96500 C, Cu = 63.5)

(d) (i) Balance the following equation by using either oxidation number method or ion-electron method.



(ii) Which one is more acidic between the following acids? Give reason.



(e) (i) How would you change the temperature on the following equilibrium to get the highest quantity of  $\text{SO}_3(\text{g})$ ?



(ii) You are shown two colourless salts which are supposed to be an alkali chloride and an alkali iodide. How will you distinguish between these two salts by chemical means?

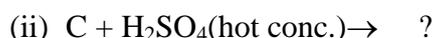
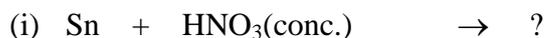
(f) Write down the symbolic equations for the following.

(i) Starting from quicklime, how would you prepare acetylene?

(ii) What happens when zinc hydroxide reacts with HCl?

What would you expect when iron(III) oxide is treated with carbon monoxide at around  $700^\circ\text{C}$ ?

(g) Complete the following equations **in words and symbols**.



(h) (i) What are the differences between polyamide and polyester in their structures?

(ii) Draw the structure of sodium stearate. Point out the hydrophilic and hydrophobic parts in this structure.

[P.T.O.]

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

- (a) (i) What is the pH of a solution with  $[H^+] = 0.05 \text{ mol dm}^{-3}$ ?  
 (ii) Calculate the heat of formation of sugar  $C_{12}H_{22}O_{11}(s)$  if its heat of combustion is  $-5040 \text{ kJ mol}^{-1}$ . The heats of combustion of carbon (graphite) and hydrogen are  $-393 \text{ kJ mol}^{-1}$  and  $-286 \text{ kJ mol}^{-1}$ , respectively.
- (b) (i) Give equation (**in symbols**) for the decomposition of ethene ozonide with water and zinc dust in the presence of traces of silver and hydroquinone. Why are these catalysts used in this reaction?  
 (ii) Illustrate the fermentation of glucose with relevant equation and name the organic product(s).  
 (iii) Write down the **symbolic equation** for the reaction of *iso*-butene and HBr. What is the major product? Give the name of the rule used in this reaction.  
 (iv) What is zeolite? Convert methanol to gasoline (hydrocarbons) by using zeolite.
- (c) (i) How would you differentiate between ethyl acetylene and dimethyl acetylene?  
 (ii) A compound "X" is formed by passing ethanol over freshly reduced copper heated at  $300 \text{ }^\circ\text{C}$ . What is compound "X"? Write down the chemical equation.  
 (iii) State the long forms of the following polymers: PP and PS. Mention their uses.  
 (iv) Describe the equation **in words and symbols** for the saponification reaction.
- (d)(i) State the collection methods in the laboratory preparation of nitrogen dioxide and ammonia gases and give their respective reasons.  
 (ii) Write equations **in symbols** for the reduction reaction of the following substances with  $H_2S$  and  $SO_2$ .
- $KMnO_4$  ;  $K_2Cr_2O_7$
- (e) (i) Explain the acid-base concepts of G. N. Lewis Theory.  
 (ii) A 10 g of a mixture of anhydrous sodium carbonate and sodium chloride were made up to 1 liter of aqueous solution. A  $25 \text{ cm}^3$  of this solution required  $18 \text{ cm}^3$  of 0.1 M sulphuric acid for neutralization. What was the mass of sodium chloride in this mixture? (Na = 23, O = 16, C = 12)
- (f) (i) Di lead(II) lead(IV) oxide behaves as a mixture of lead(II) oxide and lead(IV) oxide. Explain this statement.  
 (ii) State the formula, common name and chemical name of ore and usual method of extraction for copper and iron, respectively.

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