

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 discharge of positive ions at a cathode is a reduction.
 - (b) Alkenes contain triple bond between two carbon atoms.
 - (c) In an atom, the particles with a negative charge are protons and the particles with no charge are neutrons.
 - (d) The addition of catalysts changes the position of equilibrium.
 - (e) A formula is used to express the composition of a substance.
 - (f) Ions are derived from atoms but differ from them by having electrical charges.
 - (g) Positive value of ΔH^θ indicates heat gain by the system.
2. Fill in the blanks with the correct word(s), phrase(s), term(s), unit(s), etc., (7 marks)
as necessary.
- (a) _____ occurs in nature as the silicate in rocks and clays.
 - (b) Zinc is used in alloys such as _____.
 - (c) _____ gas has a characteristic pungent smell.
 - (d) Bleaching action of sulphur dioxide is due to its _____ property.
 - (e) _____ is the most reactive of the electronegative element.
 - (f) Salts are strong solid and can be completely dissociated in _____ solution.
 - (g) The percentage by mass of carbon in ethane is _____.
3. Select the correct word(s), notation(s), term(s), unit(s), etc., given (7 marks)
in the brackets.
- (a) $^{31}_{15}\text{P}$ and $^{32}_{16}\text{S}$ have the same number of [electrons; protons; neutrons].
 - (b) [Alkane; Alkene; Alkyne] is used for ripening fruits.
 - (c) [Lead; Gold; Sodium] is used as a shield against radioactive material and X-rays.
 - (d) The [chromium; zinc; copper] prevents the steel from rusting while the nickel makes it harder.
 - (e) [Carbondioxide; Nitrogen; Oxygen] forms the major constituent of the atmosphere.
 - (f) Solid sulphur can exist in [one; two; three] crystalline forms.
 - (g) The undissolved substance in sea water is [CaC_2 ; CaCO_3 ; CaH_2].

[P.T.O.]

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

| List A | List B |
|---------------------------|---|
| (a) Chemical energy | (i) Ammonia-oxidation process |
| (b) Nitric acid | (ii) sodium chloride |
| (c) Methanol | (iii) sodium hydrogencarbonate |
| (d) Rock salt | (iv) energy due to the structure of the substance |
| (e) Extraction of sulphur | (v) small amount of acid in aqueous solution |
| (f) Baking soda | (vi) wood spirit |
| (g) Dilute acid | (vii) Frasch process |

5. Define the following: **(8 marks)**
- (a) An electrolyte
 - (b) Buffer solution
 - (c) Molarity
 - (d) Mass number
 - (e) Oxidizing agent
 - (f) Molar volume of gases
 - (g) Endothermic reaction
 - (h) Fertilizers

SECTION (B)

6. Answer **ALL** questions. **(12 marks)**
- (a) Explain why rise in temperature increases the rate of reaction.
 - (b) Write the chemical formulae for
 - (i) Soda ash (ii) Gypsum (iii) Washing soda (iv) Caustic soda
 - (c) Explain the following terms:
 - (i) Corrosion (ii) Plating
 - (d) Give the names and formulae of three oxides of nitrogen.
 - (e) The alkanes are a series of hydrocarbons.
 - (i) Give the general formula for an alkane.
 - (ii) Draw the structure of two isomers of the alkane with $n=4$.
 - (f) What are the methods for recycling plastic wastes?

7. Answer any FIVE questions.

(20 marks)

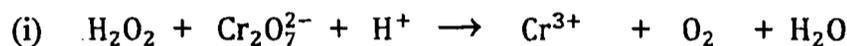
(a) Element E contains 2 electrons in K shell, 8 electrons in L shell and 2 electrons in M shell. Answer the following.

- (i) The atomic number of element E
- (ii) The complete electronic structure of element E
- (iii) The chief valence and the group number
- (iv) The name of the element E.

(b) 4g of oxygen gas is given. Calculate the amount of oxygen in moles, molecules, volume in dm^3 at STP and density of oxygen at STP. (O= 16)

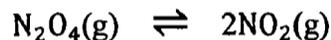
(c) On passing a steady current of 0.75A for 25 minutes through a copper(II) sulphate solution, 0.369 g of copper is deposited. Calculate the relative atomic mass of copper. (1F= 96500C)

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



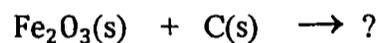
(e) (i) Explain the term negative catalyst .

(ii) Using Le-Chatelier's principle, predict the effect of increasing pressure on the following equilibrium.



(f) (i) Give two uses of stainless steel and solder.

(ii) Write balanced equations in **symbols** only for the following reactions.



(g) Give equations in **words** and **symbols** for the following reactions.

(i) Reaction of chlorine with excess ammonia.

(ii) Reaction of ammonia with heated magnesium.

(h) (i) Which element N or P or K is most suitable for seed bearing plants and for leaf crops?

(ii) Give relevant explanation for the addition of lime and also of gypsum to the soil.

[P.T.O.]

8. Answer any **FOUR** questions. (32 marks)
- (a) (i) What is meant by the quantity ' K_w '? Give the numerical value.
 (ii) Calculate the hydrogen ion concentration of the solutions having the pH value of 4.3 and pOH value of 12.3.
- (b) (i) What are the standard conditions chosen for energy changes?
 (ii) Calculate the heat of combustion of propane gas (C_3H_8), if its heat of formation is -110 kJmol^{-1} . The heat of formation of $CO_2(g)$ and $H_2O(l)$ are -393 kJmol^{-1} and -286 kJmol^{-1} , respectively.
- (c) What happens when
 (i) propene is pass into bromine solution?
 (ii) methyl iodide is treated with hydrogen iodide?
 (iii) ethyl chloride is heated with alcoholic solution of KOH?
 (iv) ethanol reacts with concentrated sulphuric acid at 140°C ?
- (d) (i) Distinguish between iso-butane and iso-butene.
 (ii) A compound X is formed by passing ethanol over freshly reduced copper heated at 300°C . What is compound X? Write down the chemical equation.
 (iii) How would you separate the crude oil? Which type of apparatus is used in this separation?
 (iv) What are the three major fossil fuels? How are the fossile fules formed?
- (e) Describe the Manufacturing of sulphuric acid by the Contact process.
- (f) Write the balanced equations (**words and symbols**) for the laboratory preparations of bromine and iodine gases.
 Describe the oxidizing properties of bromine or iodine.
- (g) 5g of a mixture anhydrous sodium sulphate and sodium sulphate decahydrate on heating to constant mass produces 3.2g of anhydrous salt. What percentages of anhydrous and hydrated salt are present in the mixture?
 (Na = 23, O = 16, H = 1, S = 32)
- (h) Write a process for the extraction of lead from its ore.
