Council for Technical Education and Vocational Training

Office of the Controller of Examinations

Sanothimi, Bhaktapur

Regular/Back Exam-2078, Bhadra

Program:	**Diploma in Engineering All**	**Full Marks: 60**
Year/Part:	**I/I (New + Old)**	**Pass Marks: 24**
Subject:	**Engineering Chemistry I**	**Time: 3 hrs**

Candidates are required to give their answers in their own words as far as practicable.
The figures in the margin indicate full marks.

Attempt <u>All</u> questions.

1. a) What do you mean by Eq. wt. of element? Prove that ; Molecular wt. = 2 x Vapour density. [1+4]

   b) How is Dalton's atomic theory modified in the light of Modern Knowledge? [5]

2. a) State and explain Faraday's First law of electrolysis. Calculate the mass of copper deposited by electrolysis on passing 2.5A current for 45 minutes through the solution of $CuSO_4$. (At. wt. of Copper = 63.5) [2+3]

   b) State drawback of Rutherford's atomic model. What are the basic postulates of Bohr's atomic Model? [2+3]

3. a) State Dulong's and Petit's law. 0.444 gram of Metal when dissolved in dilute HCl gave 177 ml of dry hydrogen at $10°c$ and 750 mm Hg pressure, the specific heat of the metal is 0.107. Calculate exact atomic wt. of metal. [1+4]

   b) State Mendeleev's periodic law? Explain Mendeleev's periodic table in brief. Also mention it's anomalies. [1+2+2]

4. a) What is redox reaction? Balance the following chemical Equation by oxidation number method. [1+4]

$$Cu + HNO_3 \rightarrow Cu(NO_3)_2 + NO + H_2O$$

   b) What do you mean by acid and base according to Arrhenious concept? Also mention it's limitations. [3+2]

5. a) What are the significance of given chemical Equation? [3+2]
$CaCO_3 + 2HCl \rightarrow CaCl_2 + H_2O + CO_2\uparrow$ Also, Mention the limitations of chemical Equations.

Cont.....

b) How can you determine the Equivalent weight by indirect oxide formation method. [5]

6. Write short notes on : **(Any Five)** [5x2=10]

a) Radical
b) Covalent bond
c) Hunds rule
d) Titration
e) Normality
f) Primary standard substances

Good Luck!

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