Mid-West University

# Examinations Management Office

End Semester Examination 2081

Bachelor level/ B. Sc. Env/ 1st Semester — Full Marks: 60

Time: 3 hours — Pass Marks:30

**Subject: General Chemistry (ENV414)**

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

## Group A

**1. Answer the following questions in very short (*Any Ten*)** **[10x2 = 20]**

**a)** Define mole concept with suitable example.
**b)** Differentiate between qualitative and quantitative analysis.
**c)** Give two points of difference between drugs and medicine.
**d)** Do you think about plastic a useful material or a polluting material? Justify your answer.
**e)** Define free path mean. Write any two factors that affect mean free path.
**f)** How do critical temperate and pressure affect the cooling of gas?
**g)** Why are liquid drops spherical in shape? Explain with proper reason.
**h)** How does single electrode potential generate?
**i)** What is Vant's Hoff factor? Write Vant's Hoff equation for different colligative property.
**j)** Why lithium-ion battery is more efficient than lead ion battery?
**k)** Define buffer solution. Mention its types.
**l)** What is cement? Write its composition.

## Group B

**Answer the following questions in brief (*Any Four*)** **[4x5 = 20]**

**2. a)** Find the number of molecules present in 5.6 liters of oxygen gas.
**b)** Find the volume of oxygen gas to burn 6.4 g of methane gas.

**3.** Define titration. Differentiate between acidimetry and alkalimetry with example.

**4.** Derive Van der Waal's equation of state. Also, write the significance of Van der Waal's constant.

**5.** What is viscosity? Derive an expression for the viscosity measurement by Ostwald's Viscometer method.

**6.** Define electrochemical series. Write its applications.

## Group C

**Answer the following questions in detail (*Any Two*)** **[2x10 = 20]**

**7.** How can you find out $p^H$ of unknown solution by using Quinhydrone electrode? Derive a mathematical formulation, cell notation with a label diagram.

**8.** Write the postulates of the Kinetic molecular theory of gas. Derive the Kinetic gas equation. Find out the RMS velocity of nitrogen gas at $25^oC$.

**9.** Define limiting reagent? Why it is important to determine a limiting reagent in any chemical reaction?

10 g of 90 % pure calcium carbonate react with 7.36 gm of hydrochloric acid.

$CaCO_3 + 2HCl \rightarrow CaCl_2 + CO_2 + H_2O$

**a)** Find limiting reagent.
**b)** Determine the number of moles of excess reactant left.
**c)** Find the volume of $CO_2$ formed.
**d)** Find the amount of NaOH required to absorb whole of the $CO_2$.

**The End**