

Unit-Test: Physical Chemistry

Subject: Chemistry

F.M. - 60

Class: CMLT/DPH/HA/Physiotherapy-1ST Year

P.M. - 24

Time: 2hrs.

Candidates are required to give the answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Group 'A'

Attempt any **FIFTEEN** Questions.

[2×15 = 30]

- Write down the molecular formula of following compounds:
a) Blue vitriol, b) Bleaching powder, c) Washing soda, d) Plaster of Paris.
- Define molecular and empirical formula with examples.
- What are volatile compounds? How the volatile compounds are separated from the mixture of volatile and non-volatile compounds?
- State Modern periodic law. How does it differ from Mendeleev's periodic law?
- Nitrogen and oxygen, which has the greater ionization potential and why?
- A sample of nitrogen gas occupies a volume of 150 L at 90°C. What will be Volume of nitrogen gas when the temperature drops to 1°C?
- Among CO₂ and SO₂, which diffuse faster and why?
- How does the rate of diffusion relate with molecular weight of gases?
- Define a term: a) Surface tension, b) Viscosity.
- Give reason, why alcohol can flow more easily than honey
- Define following terms with example:
a) Hygroscopic solid, b) Deliquescent solid, c) Efflorescent solid
- What is electronic configuration? Write down the electronic configuration of Cr and Cu?
- Write the oxidation number of underlined atoms in the following:
a) $\underline{\text{Cr}}_2\underline{\text{O}}_7^{--}$, b) $\text{Na}_2\underline{\text{S}}_2\underline{\text{O}}_3$
- Explain the classical and electronic concept of oxidation and reduction with examples.
- Define Oxidizing agent and Reducing agent with examples.
- Define pH and pOH. Calculate the pH of 0.1M H₂SO₄.
- Define the term: a) Mole, b) Avogadro's number, c) Molar volume.
- What is rate of reaction? mention any two factors affecting the rate of reaction.
- Draw the energy profile diagram of catalysed and uncatalysed reaction.
- What is system and surrounding? Give examples.

Group 'B'

Attempt any **FOUR** Questions.

[4×4 = 16]

- Describe different block's of Modern periodic table.
- State Charle's law. Derive the relation $PV = nRT$, where the symbol have their usual meanings.

- State and explain Graham's law of diffusion.
- Gas 'X' has a molar mass of 72 g/mol and Gas 'Y' has a molar mass of 2 g/mol. How much faster or slower does Gas 'Y' effuse from a small opening than Gas X at the same temperature?
- What is solubility? How much copper sulphate will require saturating 80gm of water at 20°C? The solubility of copper sulphate at 20°C is 25.
- Explain the postulates of Bohr's atomic model.
- Define hydrogen bond with examples. What are the conditions required for the formation of H-bond?
- Explain oxidation and reduction reaction occurs simultaneously.
- Write down the postulates of Arrhenius theory of ionization.
- Define ionic product of water. Establish the relation between pH and pOH.
- Write short notes on Lewis concept of acid and base with examples.
- What are antacids and antabase? Write down their medical use
- 120gm pure Na₂CO₃ reacts with 86gm HCl to give NaCl, H₂O and CO₂.
a) Which one is limiting reagent and why?
b) Find the number of mole of unreacted reagent.
c) Find the weight of NaCl formed.
d) Find the volume of CO₂ produced at NTP.
- Define normality and molarity of solution. Is molarity of solution is equal to normality? If not why? 25cc of $\frac{N}{10}$ HCl neutralized 21cc of Na₂CO₃. How much water must be added to one liter solution of Na₂CO₃ to make it exactly $\frac{N}{10}$?
- Derive relationship between Normality and Molarity. Calculate the resulting normality of a solution formed by mixing 20ml of 0.8N NaOH and 30ml of 0.4M H₂SO₄ solutions.

Group 'C'

Attempt any **TWO** Questions.

[2×7 = 14]

- Define strong and weak electrolytes with examples. State and explain Faraday's law of electrolysis. State and explain Faraday's law of electrolysis. A current of 2.5 Aampere is passed through the solution of ZnSO₄ for 30minutes and deposits 1.52gm metal at cathode. Calculate the equivalent weight of Zn. (2+3+2)
- Describe the different seven types of reactions.
- Write short notes on any **TWO**:
a) Le-Chatelier's principle
b) Law of mass action
c) Hess's law

—Examinations Never End—

2081.03.17