



A Charutar Vidya Mandal's Institution
V.P. & R.P.T.P. SCIENCE COLLEGE

(AUTONOMOUS) (Grant – in – Aid)

Affiliated to Sardar Patel University

VALLABH VIDYANAGAR – 388120



Bachelor of Science (Semester – I) External Examination – 2024

US01MAICH01: Industrial Aspects of Chemistry

Date: 19th November 2024,

Day: Tuesday

Time: 11:00 AM to 01:30 PM

Total Marks: 50 Marks

Note: The figure to the right indicates full marks of the questions.

(Molecular Weight of N = 14 g/mol, O = 16 g/mol, Na = 23 g/mol, P = 31 g/mol, S = 32 g/mol, Cl = 35.5 g/mol)

Q – 1 Answer the following Multiple-Choice Questions. (All are compulsory)

[06]

- Which of the following elements has a gram-atomic weight closest to 1 g/mol?
 (A) Hydrogen (H) (B) Helium (He)
 (C) Beryllium (Be) (D) Lithium (Li)
- Which of the following units is typically used for "molar mass"?
 (A) g/mol (B) L/mol
 (C) kg (D) mol/L
- The gram-atomic weight of carbon (C) is approximately:
 (A) 6 g/mol (B) 12 g/mol
 (C) 14 g/mol (D) 18 g/mol
- Mendeleev's periodic table was primarily based on which of the following?
 (A) Atomic Number (B) Atomic Mass
 (C) Electron Configuration (D) Density of elements
- How many orbitals are found in the p subshell?
 (A) 1 (B) 3
 (C) 5 (D) 7
- What is the conversion formula from Celsius to Fahrenheit?
 (A) $^{\circ}\text{F} = (1.8 \times ^{\circ}\text{C}) + 32$ (B) $^{\circ}\text{F} = (^{\circ}\text{C} - 32) / 1.8$
 (C) $^{\circ}\text{C} = (1.8 \times ^{\circ}\text{F}) + 32$ (D) $^{\circ}\text{K} = ^{\circ}\text{C} + 273.16$
- What type of temperature sensor is a pyrometer?
 (A) Mechanical Sensor (B) Electrical Sensor
 (C) Radiation Sensor (D) Solid State sensor
- What is the pH range of Phenolphthalein?
 (A) 3 – 5 (B) 8.2 – 10
 (C) 1 – 4 (D) 6 – 8
- Which of the following is titrant in complexometric Titration?
 (A) EDTA (B) CuSO_4
 (C) Na_2CO_3 (D) BaCl_2
- Which one is known as multiple range indicator?
 (A) Universal Indicator (B) True Indicator
 (C) Replacement Indicator (D) Mixed Indicator



Q – 2 [A] Prove weight % = pressure % = Volume % [05]

[B] Derive general gas Equation $PV = nRT$ [05]

OR

Q – 2 [A] Calculate molecular weight and equivalent weight of given compound (1) NaOH (2) HCl [05]
(3) H_2SO_4 (4) HNO_3 (5) CH_3COOH (6) H_3PO_4

[B] NaCl weighting 200 kg is mixed with 600 kg KCl. Find the composition of the mixture in [05]
(i) Weight% and (ii) Mole%

Q – 3 [A] Write a note on Ionization energy. [05]

[B] Enlist various quantum numbers. [05]

OR

Q – 3 [A] Define Electron affinity and discuss factors affecting on Electron affinities. [05]

[B] Discuss Aufbau principle and Hund's principle in details. [05]

Q – 4 [A] Explain Temperature scales in details. [05]

[B] Explain Classification of Temperature sensors. [05]

OR

Q – 4 [A] Explain Liquid in glass thermometer in details with neat sketch. [05]

[B] Describe bimetallic strip (straight form) in details with neat sketch. [05]

Q – 5 [A] Explain Titrant, Titrand, End point, Equivalence point, indicators in details. [05]

[B] Explain the types of reactions in titrimetric analysis. [05]

OR

Q – 5 [A] Write a note on 'Universal Indicators' and 'Mixed indicator'. [05]

[B] Describe Ostwald's theory of acid base indicators. [05]

