

[Time: 2hr]

[Marks:50]

Please check whether you have got the right question paper.

- N.B.: 1. All questions are compulsory.
 2. Figure to the right indicates full marks.
 3. Use of non – programmable scientific calculator is allowed.

Useful constants

$$c = 2.998 \times 10^8 \text{ m.s}^{-1}$$

$$R = 8.314 \text{ J.K}^{-1} \text{ mol}^{-1} = 2.0 \text{ cal.K}^{-1} \text{ mol}^{-1}$$

$$h = 6.626 \times 10^{-34} \text{ Js}$$

$$m_e = 9.110 \times 10^{-31} \text{ kg}$$

$$N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$$

Atomic mass of H = 1, C = 12, N = 14, O = 16, S = 32, Cl = 35.5

$$e = 1.602 \times 10^{-19} \text{ C}$$

$$k = 1.3811 \times 10^{-23} \text{ J.K}^{-1}$$

$$1\text{J} = 6.24 \times 10^{18} \text{ eV}$$

$$1\text{eV} = 8.06 \times 10^3 \text{ cm}^{-1}$$

$$1 \text{ amu} = 1.66 \times 10^{-27} \text{ kg}$$

1. A) Attempt **any two** of the following:
- What are secondary data sources? What are their advantages and disadvantages? 05
 - Describe the term citation? What is the purpose and significance of citation? 05
 - What is the world wide web? Give some important Internet Resources for chemistry available on the internet. 05
 - What is the impact factor of the journal? How it is calculated? What is the significance of the impact factor? 05
2. A) Attempt **any two** of the following:
- What is the scientific method? Explain the steps involved in scientific method. 05
 - How dependency of one variable on other is decided by regression analysis? 05
 - The replicate analysis of a sample of Nickel ore gave the following results:
 Amount of Ni (%): 20.24, 20.26, 20.25, 20.30 20.28, 20.32. Calculate confidence interval at 95% and 99% probability level using range (Given: $C_n = 0.40$ at 95% and 0.63 at 99%) 05
 - What is NON-Parametric and Parametric test? Give its advantage and disadvantages 05
3. A) Attempt **any two** of the following:
- What is research? Explain the steps involved in scientific research. 05
 - Why publishing a scientific work is essential? Explain the qualities of good research manuscript. 05
 - Explain the common ethics needs to be followed while writing scientific articles. 05
 - Give the general guidelines for reporting a practical and project work. 05

4. A) Attempt **any two** of the following:
- i) In a chemical industry, what control measures are required to keep you, your employees and your workplace safe? 05
 - ii) Explain the various acceptable and non-acceptable discharges to the Sanitary Sewer. 05
 - iii) Discuss the incineration method for the treatment of hazardous waste. 05
 - iv) What are the ways to reduce, reuse and recycle the chemical waste. How do these actions impact our environment, wildlife and well-being? 05
5. A) Attempt **any five** of the following:
- i) What is a Scholarly journal? Give the names of any two scholarly journals. 02
 - ii) Describe the term consortium. Give any one example. 02
 - iii) Explain when are Zero's significant in measurement. 02
 - iv) What metric units are commonly used to measure temperature and energy? 02
 - v) How to avoid authorship abuse in scientific writing? 02
 - vi) State the general rules for writing conclusion. 02
 - vii) What are cryogenics? What precautions are required while handling of cryogenics? 02
 - viii) What actions must be taken in the event of chemical spills? 02
