19

D1BCH2201 (PAGES 2) Reg.No.....

Name: .....

FIRST SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2022

(Regular/Improvement/Supplementary)

CHEMISTRY

GCHE1B01T: THEORETICAL AND INORGANIC CHEMISTRY- I

Time: 2 Hours **Maximum Marks: 60**

SECTION A: Answer the following questions. Each carries 2 marks.
(Ceiling 20 Marks)

1. Give a reasonable explanation of the term science.
2. Define mole fraction of a component in a solution. How does it depend upon the temperature?
3. Arrange the following atoms in the increasing order of first ionization enthalpy: Li, Be, B. Explain your answer.
4. How much will be the dipole moment of CH_4 molecule? Explain.
5. What is hydroboration? Give an example.
6. Give the product of reaction of orthoboric acid with calcium fluoride and conc. H_2SO_4. Give equation.
7. Draw the structure of peroxomonosulphuric acid.
8. "Water should never be added into concentrated sulphuric acid for diluting it." Justify this statement.
9. Explain a method by which ammonia can be prepared in the laboratory.
10. What is the reaction responsible for the energy production in sun?
11. Describe any two applications of radioisotope in medicine.
12. What do you mean by isotopes? Give two examples.

SECTION B: Answer the following questions. Each carries 5 marks.
(Ceiling 30 Marks)

13. Discuss the empirical approach adopted in the methods of science.
14. What do the terms 'absolute error' and 'relative error' mean with regard to analytical determinations? The true value for the determination of the NaOH in a given aqueous solution of it is 4.012 g L^{-1}. The result reported by an experimentalist is found to be 3.982 g L^{-1}. Calculate the absolute error and relative percentage error.
15. Explain how the shielding effect of inner electrons influences the ionization enthalpy and electron affinity of an element.
16. Mention the general characteristics of covalent compounds.
17. "The alkali metals and their salts impart characteristic colour to a non-luminous Bunsen flame." Explain this statement.

(PTO)

18. Calculate the energy released in the following fission reaction:
$_{92}U^{235} + {}_{0}n^{1} \rightarrow {}_{54}Xe^{139} + {}_{38}Sr^{95} + 2{}_{0}n^{1}$ Given: Masses of U – 235, Xe – 139 and Sr – 95 and neutron are respectively 235.124 amu, 138.954 amu, 94.945 amu and 1.0099 amu.
19. Discuss on the technique for the determination of ages of rocks and minerals containing uranium and thorium

SECTION C: Answer any 1 question. Each carries 10 marks.

20. Explain the following acid – base titrations using titration curves with example and also mention the suitable indicator for each titration.
    (a) strong acid x weak base.
    (b) weak acid x strong base.
21. State and explain the postulates of the VSEPR theory. Explain how can you apply the VSEPR theory to predict the shapes of ammonia and water.

(1 x 10 = 10 Marks)