

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Chemistry Degree Examination, November 2023

BCH1B01 – Theoretical & Inorganic Chemistry – I

(2022 Admission onwards)

Time: 2 hours

Max. Marks : 60

Section A (Short answers)

(Answer questions up to 20 marks. Each question carries 2 marks)

1. Differentiate between inductive and deductive method.
2. What first aid should be given to a student who has been burnt by concentrated Sulphuric acid in the laboratory ?
3. How many significant digits are there in following measurement?
a) 10.2g b) 5.0L
4. Calculate the number of molecules present in 2.24L of CO_2 at STP.
5. What are causes of diagonal relationship of 2nd and 3rd period elements?
6. What is inert pair effect ?
7. What are the conjugate acids of H_2O and NH_3 ?
8. Explain Nuclear fusion reactions.
9. State dipole moment. How dipole moment is related to percentage of ionic character of the bond.
10. What is rock dating?
11. What are the factors affecting polarizing power of cations?
12. What is the equivalent mass of an acid? Calculate equivalent mass of H_2SO_4 .

[Ceiling of marks: 20]

Section B (Paragraph)

(Answer questions up to 30 marks. Each question carries 5 marks)

13. Explain sequential steps of scientific method.
14. Calculate the molarity of a solution of ethanol in water in which the mole fraction of ethanol is 0.04. Assume density of water to be one.
15. Define electronegativity. What are the factors affecting electronegativity? How does electronegativity vary across the periodic table?
16. Explain various types of errors.
17. Discuss Lux-Flood concept of acids and bases. Mention its limitations.
18. Explain any two methods of separation of isotopes.
19. Explain Born Haber cycle in the determination of lattice energy.

[Ceiling of marks: 30]

Section C (Essay)
(Answer any one. Each question carries 10 marks)

20. a) Draw the structures any four oxo and peroxy acids of Sulphur. Mention basicity of each acids. (6marks)
- b) The amount C-14 isotopes in a piece of wood is found to be one – tenth of that present in a fresh piece of wood. Calculate Age of wood. ($t_{1/2}$ of C-14 is 5760 years) (4marks)
21. a) Define molality.
Calculate molality of a solution by dissolving 18g glucose in 4Kg of water. (6marks)
- b) Write any four good practices working safely in chemistry laboratory (4marks)

[1 x 10 = 10 marks]

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE
First Semester-B.Sc Degree Examination, November 2023
BCH1C01 – General Chemistry
(2022 Admission onwards)

Time: 2 hours

Max. Marks : 60

Section A (Short answers)
(Answer questions up to 20 marks. Each question carries 2 marks)

1. What is a metal activated enzyme?
2. Explain why water shows anomalous variation of density between 0°C and 4°C ?
3. Define mole.
4. What is heme protein? Name two.
5. Calculate the normality of a solution containing 20g of NaOH in 2L.
6. What is Group displacement law ?
7. What is common ion effect ?
8. State Hund's rule of maximum multiplicity.
9. Write down Schrodinger wave equation and mention the terms.
10. What is N/p ratio? Mention its significance.
11. Name the metal present in a) catalase and b) carbonic anhydrase
12. Define lattice energy.

[Ceiling of marks: 20]

Section B (Paragraph)
(Answer questions up to 30 marks. Each question carries 5 marks)

13. Explain the electronic concept of oxidation and reduction.
14. Distinguish between accuracy & precision.
15. Explain sodium – potassium pump.
16. Explain the principle of Atom bomb.
17. Explain the shapes of a) XeF_2 and b) SF_4 molecule, based on VSEPR theory.
18. Explain metal ion indicators & mention their functions with suitable example.
19. Describe the radiocarbon dating technique.

[Ceiling of marks: 30]

Section C (Essay)
(Answer any one. Each question carries 10 marks)

20. a) Draw the MO diagram of CO molecule and calculate the bond order.
b) Discuss the differences between Haemoglobin & myoglobin.
21. a) Explain Quantum numbers.
b) Discuss the limitations of Bohr theory.

[1 x 10 = 10 Marks]