

B.Sc. Semester - 2 (NEP-2020) Examination**MARCH/APRIL-2026****CHE: Foundation in Chemistry (Major-4)****Time: 2:00 Hours****Marks: 50****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

- Que.1 Answer the following questions. (10)
(1) Discuss the classification of oxides based on their oxygen content with examples.
(2) Explain common ion effect with suitable example.
OR
- Que.1 Answer the following questions.
(1) Discuss any three preparation and two properties of inorganic graphite.
(2) Explain charcoal test and flame test with chemical reactions briefly.
- Que.2 Answer the following questions. (10)
(1) Describe the classification of ring systems based on number of rings, size and number of carbon atom common between two rings.
(2) Explain sulphonation and Friedel-Craft acylation of benzene with mechanism.
OR
- Que.2 Answer the following questions.
(1) Discuss any three methods of preparation of small ring cycloalkanes.
(2) Discuss aromaticity of following organic compounds;
a) [8]-annulene b) Cyclobutadiene c) Cyclopentadienyl anion
- Que.3 Answer the following questions. (10)
(1) Calculate the number of atoms per unit cell for cubic lattices SC, BCC and FCC.
(2) Explain (i) Ionic solids (ii) Metallic solids
OR
- Que.3 Answer the following questions.
(1) Derive Bragg's equation of solid state.
(2) Explain structure of NaCl by X-ray crystallography.
- Que.4 Answer the following questions. (10)
(1) Write any five dry tests for negative radicals with chemical reactions involved.
(2) Explain theory of effect of substituent on orientation in nitrobenzene with resonating structures and concept of sigma complex stability.
OR
- Que.4 Answer the following questions.
(1) Write preparation, chemical properties and characteristics of following oxides;
i). Dinitrogen trioxide ii) Dinitrogen tetroxide
(2) Draw the relative energy level diagram of conformations of butane and explain Klyne Prelog terminology for their designations.
- Que.5 Answer the following questions. (10)
(1) Give a brief account on Baeyer's strain theory with limitations.
(2) Differentiate amorphous and crystalline solids in detail.
OR
- Que.5 Answer the following questions.
(1) Write criteria for aromatic and anti-aromatic compounds with two examples each.
(2) Write a note on structure of potassium chloride by crystallography.
