

B.Sc. Semester - 2 (CBCS) Examination
June/July-2022 [NEW COURSE]
CHEMISTRY (CORE)

Time: 2:30 Hours

Marks: 70

Instructions:

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

Q. 1 (a) Answer the following question. (4)

- (1) Give hybridization and shape of i) XeO_3 ii) XeOF_4 iii) ClF_3 iv) ICl_2^-

Q. 1 (b) Answer any two questions out of three. (10)

- (1) Derive r^+/r^- ratio for tetrahedral crystal lattice.
- (2) Define oxide give the classification of oxide based on their chemical behaviour.
- (3) Discuss structure and Lewis acidity of boron halide.

Q. 2 (a) Answer the following question. (4)

- (1) Give ring opening reaction of cyclopropane and cyclobutane.

Q. 2 (b) Answer any two questions out of three. (10)

- (1) Explain electrophilic addition reaction in alkynes.
- (2) Explain effect of electron donating substituent on the orientation in benzene based on the stability of intermediate resonance structure.
- (3) Explain Baeyer's strain theory with limitations.

Q. 3 (a) Answer the following question. (4)

- (1) Why HCl is added with H_2S to precipitate ions of 2nd group.

Q. 3 (b) Answer any two questions out of three. (10)

- (1) Explain Bragg's X-ray diffraction method for Internal analysis of Crystal.
- (2) Derive the equation of pH of salt of weak acid & strong base.
- (3) Explain the buffer mechanism of acidic and basic buffer solution.

Q. 4 (a) Answer the following question. (4)

- (1) What are fused ring, bridge ring, spiro compound and small ring?
Give example of each.

Q. 4 (b) Answer any two questions out of three. (10)

- (1) Explain Non-stoichiometric defect of crystal lattice.
- (2) Explain Diels-Alder reactions.
- (3) Explain Internal structure of KCl by X-ray diffraction data.

Q. 5 (a) Answer the following question. (4)

- (1) Give the difference between Amorphous and crystalline solids.

Q. 5 (b) Answer any two questions out of three. (10)

- (1) Discuss the oxoacids of sulphur.
- (2) Explain bromination of benzene with mechanism.
- (3) Calculate the hydrolysis constant, degree of hydrolysis and pH of 0.02M NH_4Cl solution. (K_b of $\text{NH}_4\text{Cl} = 1.85 \times 10^{-5}$)
