

B.Sc. Semester - 2 (CBCS) Examination
March/April - 2023 (OLD COURSE)
CHEMISTRY (CORE)

Time: 2:30 Hours

Marks: 70

Instructions:

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

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- Q.1(A) Answer the following questions. (04)**
1. What is Non-stoichiometric defect?
 2. Define: unit cell.
 3. How many isomers are possible for Ma_2b_2 type complex?
 4. Define: Co-ordination number.
- Q.1(B) Answer the following question. (Any One) (02)**
1. Write note on n-type semi conductore.
 2. Draw the geometrical isomer of $[\text{Co}(\text{en})_2\text{Cl}_2]$
- Q.1(C) Answer the following question. (Any One) (03)**
1. Show the derivation of the r^+/r^- value for trigonal lattice.
 2. Explain Werner's theory.
- Q.1(D) Answer the following question. (Any One) (05)**
1. Discuss Born-Haber cycle.
 2. Write note on face-Mer isomerism
- Q.2(A) Answer the following questions. (04)**
1. Why are melting point of transition element?
 2. Give the use of iron and zinc.
 3. Give the co-ordination number of Na in NaCl crystal lattice.
 4. Give examples of amorphous substances.
- Q.2(B) Answer the following question. (Any One) (02)**
1. Write the electronic configuration of Cr and Cu.
 2. Define: Isotropic and Anisotropic.
- Q.2(C) Answer the following question. (Any One) (03)**
1. Describe the difference between diamagnetic and paramagnetic nature.
 2. Explain types of cubic lattice with figure.
- Q.2(D) Answer the following question. (Any One) (05)**
1. Write note on spectral properties of first transition series element.
 2. Discuss the internal structure of KCl by X-ray diffraction data.
- Q.3(A) Answer the following questions. (04)**
1. Angle strain is also known as.....
 2. Give one example of bicyclic compound with IUPAC name.
 3. Define the conformers.
 4. What are cycloalkanes?
- Q.3(B) Answer the following question. (Any One) (02)**
1. Give any two methods for preparation of small ring cycloalkane.
 2. Explain addition reaction in cyclo propane.

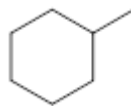
Q.3(C) Answer the following question. (Any One) (03)

1. Give IUPAC nomenclature of given compounds.

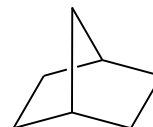
I.



II.



III.



2. Give any two addition reaction of cycloalkane.

Q.3(D) Answer the following question. (Any One) (05)

1. Explain Baeyer's Strain theory and its limitations.

2. Explain conformations of n- Butane.

Q.4(A) Answer the following questions. (04)

1. Give example of meta directing group.

2. Define: Electrophilic aromatic substitution reaction.

3. Which reagents are used for sulphonation of benzene.

4. Give any two criteria for aromaticity.

Q.4(B) Answer the following question. (Any One) (02)

1. Explain aromaticity of [8] annulene.

2. Explain general pattern of the SE^2 mechanism.

Q.4(C) Answer the following question. (Any One) (03)

1. Explain aromaticity of cyclopentadienyl ions.

2. Explain halogenation of benzene with mechanism.

Q.4(D) Answer the following question. (Any One) (05)

1. Why halogen substituents are ortho, para directing but deactivating? Explain in detail.

2. Discuss Friedel-Crafts Alkylation of benzene with mechanism.

Q.5(A) Answer the following questions. (04)

1. Calculate the value of K_w at $25^\circ C$.

2. Define Buffer capacity

3. What is the nature of aqueous solution of $FeCl_3$?

4. Define; strong electrolytes

Q.5(B) Answer the following question. (Any One) (02)

1. Describe the factors affecting the degree of Dissociation.

2. Deduce the relation between K_h , K_w & K_b .

Q.5(C) Answer the following question. (Any One) (03)

1. Describe Solubility and solubility product.

2. Describe the degree of dissociation of weak acid.

Q.5(D) Answer the following question. (Any One) (05)

1. Calculate relation between K_h , K_w and K_a and P^H for salt of weak acid and strong base.

2. Find out the Hydrolysis constant and P^H for 0.5 M CH_3COONa solution.

$$K_a = 1.74 \times 10^{-5}$$
