

S.NO: 22N1-UCH

Course Code: QUD

A.D.M.COLLEGE FOR WOMEN, NAGAPATTINAM

(AUTONOMOUS)

B. Sc. (Chemistry) Degree Examination

III Semester – November – 2022

CC III – GENERAL CHEMISTRY III

Time: 3 hours

Maximum Marks: 75

Section –A

10X2=20

Answer **ALL** the Questions:

1. Draw the structure of P_2O_5 molecule. Write any two uses.
2. How is hydrazoic acid prepared from hydrazine?
3. What is basic oxides? Give three examples of basic oxides.
4. Compare the acid strength of $HClO$, $HClO_2$, $HClO_3$ and $HClO_4$.
5. Differentiate Enantiomer and diastereomer.
6. Give an example for erythro and threo isomers.
7. State Charles' law. Draw Pressure vs. Volume plot.
8. What is meant by the compressibility factor?
9. Diamond has a sharp melting point, whereas glass does not have a sharp melting point. Why?
10. Calculate the miller indices for the plane with intercepts $2a$, $-3b$ and $4c$ the along the crystallographic axes.

Section -B

5X5=25

Answer **ALL** the Questions:

11. a) What is inorganic benzene? Why is it called so? Discuss its structure.

(or)

b) How is hydrazine prepared? How does it react with (i) ozone and (ii) Silver nitrate?

12. a) Write short notes on Thionic acids.

(or)

b) Explain the preparation, properties, structure and uses of $\text{Na}_2\text{S}_2\text{O}_3$.

13. a) Explain the optical activity of allenes and spiranes.

(or)

b) Explain geometrical isomerism with suitable examples? Explain their types.

14. a) Account for the deviation from ideal behavior of gases and derive virial equation of state.

(or)

b) Write a short note on (i) Collision number (ii) Collision diameter (iii) mean free path.

15. a) Derive Bragg's law and its applications

(or)

b) (i) Differentiate isotropy and anisotropy

(ii) What is the critical radius ratio for the CsCl structure?

Section -C

3 X 10 = 30

Answer any **THREE** Questions:

16. (i) Write a brief note on the allotropy of carbon.

(ii) Explain the chemistry involved in the borax bead test.

17. (i) Mention any four pseudohalogens and explain the properties of CN^- .

(ii) Write a note on the oxidation states of various hypohalous acids.

18. (i) What is a racemic mixture? Discuss the different methods of resolution of racemic mixtures.

(ii) With suitable examples represent the Fisher, Sawhorse and Newman projection of any two chiral molecules.

19. (i) Discuss the Maxwells distribution of molecular velocities with suitable sketch.

(ii) Derive the relationship between van der Waals constant and critical constants.

20. (i) Discuss the structure of Zinc blende and Rock-salt crystal structure.

(ii) Explain in detail about extrinsic semiconductors.