QP CODE: 24801165

24801165

Reg No : .....

Name : .....

INTEGRATED MSC DEGREE EXAMINATION, FEBRUARY 2024

First Semester

INTEGRATED MSC BASIC SCIENCE-CHEMISTRY

CORE - ICH1CR04 - BASIC LEVEL IN THEORETICAL AND ANALYTICAL CHEMISTRY

2020 Admission Onwards

69A3EE27

Time: 3 Hours Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Explain postulates of Dalton's Atomic theory.
2. Explain the significance of Heisenberg's uncertainity principle.
3. What is meant by a well behaved wave funtion?
4. What are point groups? Find out the point grp of NH3, H2O, CO2 and CO.
5. Identify the point group for the following SF6 and PH4+. List the symmetry elements associated.
6. Distinguish between sigma and pi bond.
7. What are the different types of hydrogen bonding? Give examples.
8. What is the oxidation number of iodine in the following compounds: IF5, KI, I2, ICl and HIO4
9. An aqueous solution of 6.3 g oxalic acid dihydrate is made upto 250 mL. The volume of 0.1 N NaOH required to completely neutrslize 10 mL of this solution
10. Why we use detecting agents in TLC? Give examples.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Explain black body radiation.
12. Explain the postulates of quantum mechanics.

13. Discuss different point groups with example.

14. Briefly explain hybridiation.

15. On the basis of VSEPR theory, explain the geometry of NH3 and H2O.

16. Explain free electron theory. What are its limitations.

17. What is the applications common ion effect in the precipitation of cations?

18. Explain the principles, Instrumentation and applications of HPLC

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. What is quantum tunnelling? Explain.

20. Draw the MO energy level diagram of N2 molecule and explain its magnetic property. Calculate its bond order

21. What is titration curve? Discuss the titration curve for the neutralization of a) a strong acid with a strong base b) strong acid with a weak base

22. Explain the principle and applications of ion exchange chromatography.

(2×5=10 weightage)