25802572

QP CODE: 25802572

Reg No : .....

Name : .....

INTEGRATED MSC DEGREE EXAMINATION, MAY 2025

Fourth Semester

INTEGRATED MSC BASIC SCIENCE-PHYSICS

COMPLEMENTARY - IPH4CM05 - CONCEPTS OF PHYSICAL CHEMISTRY

2021 Admission Onwards

1FA6A120

Time: 3 Hours Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. What are the possible transitions in electronic spectroscopy?
2. What do you mean by quantum dots and nano crystals?
3. Give any three factors that influence the rate of a reaction.
4. Define activation energy of a reaction.
5. State activated complex theory.
6. Give any two differences between photochemical and thermal reactions.
7. What are the products obtained by the electrolysis of NaCl solution using platinum electrodes?
8. Define conductometric titrations.
9. Write the electrode reaction of calomel electrode.
10. Give the oxidation half cell reaction of hydrogen oxygen fuel cell.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. What is meant by quantisation of energy?
12. Explain the mechano-chemical method for the synthesis of nanomaterials.
13. Discuss the adsorption theory of catalysis.
14. Discuss the reasons of high and low quantum yield.

15. Write a note on photophysical process.

16. Discuss the applications of Kohlrausch's law.

17. What are galvanic cells? Differentiate between galvanic cells and electrochemical cells.

18. Derive the Nernst equation for the emf of a cell.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. (a) Deduce an equation for force constant of a diatomic molecule. (b) Write a note on: (i) Group Frequency (ii) Finger print region (iii) Applications of IR spectroscopy.

20. Discuss microemulsion method for nanoparticle synthesis.

21. What is a first order reaction? What are its characteristics? Deduce an equation giving the rate constant of a first order reaction.

22. Explain the different types of potentitometric titrations with suitable examples.

(2×5=10 weightage)