QP CODE: 24801780

24801780

Reg No : .....

Name : .....

INTEGRATED MSC DEGREE EXAMINATION, MARCH 2024

Fourth Semester

INTEGRATED MSC BASIC SCIENCE-PHYSICS

COMPLEMENTARY - IPH4CM05 - CONCEPTS OF PHYSICAL CHEMISTRY

2021 Admission Onwards

524975F8

Time: 3 Hours Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Calculate the wavelength of a radiation with energy 4.95×10^{-19} J.
2. Define top down and bottom up approach.
3. Distinguish between rate and rate constant.
4. What are the limitations of collision theory?
5. State Beer-Lambert law.
6. Give one example each for photochemical reactions of high quantum yield and low quantum yield.
7. What is meant by conductivity? How is it related to equivalent conductance and molar conductance?
8. State Kohlrausch's Law.
9. Give the Nernst equation for the emf of the cell.
10. What are the advanges of potentiometric titrations?

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. What are the different types of elctronic transitions in molecule?
12. Define carbon nanotube. What are the types of carbon nanotubes?

13. What are the characteristics of first order reactions?

14. Give Arrhenius equation and explain its significance.

15. Distinguish between fluorescence and phophorescence.

16. Define standard electrode potential. How is it measured? What is the significance of its sign?

17. Sketch the calomel electrode and give the electrode reaction.

18. What are fuel cells? Discuss the H_2–O_2 fuel cell.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. What are the selections rules of rotational spectroscopy? Deduce an equation for the determination of bond lengths of diatomic molecules.

20. Discuss sol-gel method for nanoparticle synthesis.

21. Discuss the theories of catalysis with suitable examples.

22. Illustrate the principle of conductometric titrations with reference to acid-base titrations.

(2×5=10 weightage)