QP CODE: 23004203

23004203

Reg No : .....

Name : .....

M Sc DEGREE (CSS) EXAMINATION, JUNE 2023

Fourth Semester

M Sc CHEMISTRY

Elective - CH800403 - ADVANCED PHYSICAL CHEMISTRY

2019 ADMISSION ONWARDS

2CB5253D

Time: 3 Hours Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Explain the important features of thermoluminescence.
2. Give the important advantages of cadmium telluride solar cells.
3. Define a fluorophore. Give three examples.
4. Explain the principle of electron diffraction analysis.
5. Explain ion association.
6. Explain Liquid junction potential.
7. Describe over potential.
8. Explain about a typical cyclic voltammogram.
9. What are the advantages of polarography?
10. What is thermal osmosis? Explain briefly.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Derive the Stern Volmer equation.
12. Write short notes on the following parts of a fluorescent spectrometer (a) monochromators (b) polarizers.
13. Discuss in detail about the structure and working of HCL.

14. Discuss the salient features of Helmoltz and Stern double layers.

15. Write a note on methyl alcohol fuel cells.

16. Explain about decomposition potential and supporting electrolyte used in polarography.

17. Discuss about the different coulometric analysis with constant current?

18. Radiation of wavelength 2200 A^0 is passed through a cell containing 20 mL of solution which contains 0.05 M oxalic acid and 0.001M uranylnitrate. After absorption of 90J of radiation energy, the concentration of oxalic acid is reduced to 0.03 M. Calculate the quantum yield for the decomposition.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Write short notes on (a) application of lasers in photochemical kinetic study. (b) two photon absorption spectroscopy.

20. Give an account of the principle and instrumentation of FES. Discuss the applications of FES briefly.

21. Derive DHO equation. What are the main drawbacks of DHO?

22. What is the theory of amperometric titrations? Discuss about the application of amperometry in the qualitative analysis of anions and cations in solution?

(2×5=10 weightage)