QP CODE: 22001951

Reg No : .....

Name : .....

M Sc DEGREE (CSS) EXAMINATION, AUGUST 2022

Fourth Semester

M Sc CHEMISTRY

Elective - CH800403 - ADVANCED PHYSICAL CHEMISTRY

2019 ADMISSION ONWARDS

DD05C1FE

Time: 3 Hours Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Give a brief description of Reinecke's salt actinometer.
2. Write a short note on the structure of cadmium telluride solar cells.
3. Briefly discuss how fluorescence can be used for sensing of chemical and biochemical analytes.
4. Explain the advantages of neutron diffraction.
5. Explain the term relaxation effect.
6. What are the limitations of solid oxide fuel cells?
7. Represent Butler –Volmer equation and explain the terms.
8. What is the basic principle behind cyclic voltametry?
9. What is the condition for secondary constant current coulometry?
10. What are coupled reactions?

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. What are the applications of lasers in photochemical kinetics?

12. Write short notes on the following parts of a fluorescent spectrometer (a) optical filters (b) polarizers
13. Explain the advantages and disadvantages of AES.
14. Distinguish between Stern and Helmoltz model for electrical double layers.
15. Write a note on different methods of corrosion control.
16. What is the significance of diffusion current in polarography? How is it helpful in the quantitaive analysis?
17. Discuss about the pilot ion procedure and standard addition method.
18. Calculate the ionic strength of a mixture of 0.001 molal $La(NO_3)_3$ and 0.01 molal solution $SrCl_2$.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Discuss on the phenomenon of quenching of fluorescence and arrive at an expression detailing its kinetics. Analyse the graphical representation also.
20. Give an account of the principle and instrumentation of AAS. What are its applications?
21. Explain the term double layer and discuss on different models of double layer.
22. Discuss the principle, instrumentation and applications amperometric titrations? Specify its advantages.

(2×5=10 weightage)