QP CODE: 21000883

21000883

Reg No : .....

Name : .....

M Sc DEGREE (CSS) EXAMINATION, JULY 2021

Fourth Semester

Faculty of Science

M Sc CHEMISTRY

Elective - CH800403 - ADVANCED PHYSICAL CHEMISTRY

2019 Admission Onwards

FC09D3A2

Time: 3 Hours Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Write a note on ferrioxalate actinometer.
2. State whether delayed fluorescence is equivalent to phosphorescence? Justify your answer.
3. What are pH sensors? Citing an example, briefly describe how a pH sensor is used to detect the analyte.
4. What are the major applications of AES?
5. Explain the validity of DHO in non-aqueous solvents.
6. Explain electro capillary.
7. Give few applications of solid oxide fuel cells.
8. Explain about a typical polarogram?
9. What is amperometric titration? Which are the demerits of amperometric titration?
10. Distinguish between exergonic and endergonic reactions in bioenergetics.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Explain the technique of two photon absorption spectroscopy. What is the main highlight of using this technique? Explain using an example.

12. Write short notes on the following parts of a fluorescent spectrometer (a) photomultiplier tubes (b) monochromators.

13. Write a note on applications of FES.

14. Write a note on the quantitative test for DHLL.

15. Explain dry corrosion and electrochemical corrosion.

16. Explain about the qualitative analysis using polarography?

17. Write about the applications of coulometric titration?

18. Acetone decomposes in presence of UV radiations to form CO and C_2H_6. The quantum yield for the reaction at 300 nm is 0.4. The sample of acetone absorbs the monochromatic radiation at 300 nm at the rate of 1.86×10^{-3} JS^{-1}. Calculate the rate of formation of CO in terms of moles and molecules.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Compare the basic features and structure of amorphous silicon and cadmium telluride solar cells.

20. Compare neutron, electron and XRD techniques.

21. Discuss briefly on different theories of corrosion.

22. a) Explain the principle of anodic stripping voltametry and discuss how the quantitaive analysis is done in a single component and multicomponent system? b) What are ion selective electrodes? Explain.

(2×5=10 weightage)