



22102737

QP CODE: 22102737

Reg No :

Name :

B.Sc DEGREE (CBCS) REGULAR EXAMINATIONS, AUGUST 2022

Fourth Semester

Complementary Course - CH4CMT05 - CHEMISTRY - PHYSICAL CHEMISTRY - II

(Common for B.Sc Geology and Water Management Model III, B.Sc Geology Model I & B.Sc Physics Model I)

2020 Admission Only

FEB9A3E1

Time: 3 Hours

Max. Marks : 60

Part A

*Answer any **ten** questions.*

*Each question carries **1** mark.*

1. Calculate the wavelength of a radiation with energy 4.95×10^{-19} J.
2. What are the possible transitions in electronic spectroscopy?
3. Classify nanomaterials and give examples for them.
4. List any four day to day live commercial applications of nanotechnology.
5. Define rate of a reaction.
6. 50% of a first order reaction is completed in 23 minutes. Calculate the time required to complete 90% of the reaction.
7. Give any two differences between photochemical and thermal reactions.
8. What is meant by primary process in a photochemical reaction?
9. What is meant by cell constant? How is it determined?
10. Define equivalent conductivity. How does it vary with dilution.
11. Briefly describe the calomel electrode.
12. What are the advantages of a fuel cell?





(10×1=10)

Part B

Answer any **six** questions.

Each question carries **5** marks.

13. How will you determine the bond length of a diatomic molecule using rotational spectroscopy?
14. Explain the role of bottom up and top down approaches in nanotechnology.
15. For the gas phase reaction $2\text{N}_2\text{O}_5 \rightarrow 4\text{NO}_2 + \text{O}_2$, if the concentration of NO_2 increases by $3.0 \times 10^{-3} \text{ mol L}^{-1}$ in 6 seconds. What is the average rate of reaction?
16. Write a note on activated complex theory.
17. Distinguish between photochemical reactions and chemiluminescence.
18. How is the conductivity of an electrolyte solution determined?
19. Explain the conductometric titration of HCl vs NaOH .
20. Explain the theory and the working of Daniel cell. Give its construction.
21. Derive a relation between free energy and electric energy.

(6×5=30)

Part C

Answer any **two** questions.

Each question carries **10** marks.

22. Deduce an equation for force constant of a diatomic molecule.
23. Discuss chemical vapour deposition method in detail.
24. Discuss the intermediate compound formation theory of homogeneous catalysis and illustrate it with a suitable example.
25. Describe the construction and function of a calomel electrode.

(2×10=20)

