21100847

QP CODE: 21100847

Reg No : .....

Name : .....

B.Sc DEGREE (CBCS) EXAMINATION, MARCH 2021

Fourth Semester

Complemetary Course - CH4CMT05 - CHEMISTRY - PHYSICAL CHEMISTRY - II

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

2017 Admission onwards

766280E5

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 is meant by the finger print region in the IR spectrum?
3. What is micro emulsion method for nanoparticle synthesis?
4. Why C-60 molecules are called as bucky balls? Give reasons?
5. Define activated complex formation in a reaction.
6. What is catalytic poisoning?
7. What is a photochemical reaction?
8. Give one example each for photochemical reactions of high quantum yield and low quantum yield.
9. Explain the term strong electrolytes and weak electrolytes with suitable examples.
10. How do the molar conductivities of strong and weak electrolytes vary with dilution ?
11. Differentiate between a galvanic cell and an electrolytic cell.
12. Give the Nernst equation for the emf of the cell.

(10×1=10)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. The frequency difference between successive lines of rotational spectrum of a diatomic molecule NO is 300 m–1. Calculate the bond length. Given that atomic weight of N = 14 and O = 16 and G = 6.626 × 10 Js and C = 3 × 108 ms–1.
14. Define nanomaterial? Give classification of nanomaterials?
15. Distinguish between average rate and instantaneous rate of a reaction.
16. If the half-life of a first order reaction A → B is 2 min, how long will it take for [A] to reach 10% of the initial concentration?
17. How will you evaluate Arrhenius parameters?
18. What is meant by molar conductivity of an electrolyte solution? How does it vary with dilution for (i) a strong electrolyte and (ii) for a weak electrolyte? Explain.
19. Write a short note on quinhydrone electrode.
20. Write a note on thermodynamics of cell reactions.
21. Discuss the principle involved in the potentiometric titration of an acid against a base. How is the end point detected in such a titration?

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **10** marks.*

22. Discuss different electronic transitions in molecule.
23. Discuss chemical vapour deposition method in detail.
24. Derive the integrated rate equation for the first order reaction. Show that half-life is independent of the initial concentration of the first order reaction.
25. Explain the principle of conductometric titrations with a suitable example. What are the advantages of the method?

(2×10=20)