

QP CODE: 20100847



Reg No : .....

Name : .....

**B.Sc DEGREE (CBCS) EXAMINATION, MARCH 2020**

**Fourth Semester**

**Complementary 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

59D2D1F3

Time: 3 Hours

Marks: 60

**Part A**

*Answer any **ten** questions.*

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

1. Give equation relating frequency of radiation with wavelength and energy.
2. What are auxochromes?
3. Classify nanomaterials and give examples for them.
4. Define top down and bottom up approach.
5. What is meant by rate determining step of a reactor ?
6. Define coefficient of temperature of a reaction.
7. Give an example for enzyme catalysed reaction.
8. What is meant by primary process in a photochemical reaction?
9. Define 'molar conductivity'. How is it related to conductivity?
10. Define conductometric titrations.
11. What is meant by a reversible cell? Give an example.
12. Give the relation between entropy change and electrical energy.

(10×1=10)

**Part B**

*Answer any **six** questions.*

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

13. Give the applications of IR spectroscopy.





14. Discuss the salient features of quantum dots lasers and LEDs.
15. Distinguish between order and molecularity of a reaction.
16. The half life of a substance in a first order reaction is 15 minutes. Calculate the rate constant.
17. Compare exothermic and endothermic reactions on the basis of activated complex theory.
18. How is the conductivity of an electrolyte solution determined?
19. What are galvanic cells? Differentiate between galvanic cells and electrochemical cells.
20. Define standard electrode potential. How is it measured? What is the significance of its sign?
21. What are fuel cells? Discuss the H<sub>2</sub>-O<sub>2</sub> fuel cell.

(6×5=30)

### Part C

*Answer any **two** questions.*

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

22. What are the selection rules of rotational spectroscopy? Deduce an equation for the determination of bond lengths of diatomic molecules.
23. Discuss sol-gel method for nanoparticle synthesis.
24. State and explain Stark-Einstein law of photochemical equivalence. Give the explanation for low and high quantum yields.
25. State Kohlrausch's law of independent migration of ions. How is it useful in determining the molar conductivity at infinite dilution of a weak electrolyte?

(2×10=20)

