

QP CODE: 20100847



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

### **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

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 is 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.

 $(10 \times 1 = 10)$ 

#### Part B

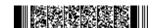
Answer any **six** questions.

Each question carries **5** marks.

13. Give the applications of IR spectroscopy.



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- 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 H2-O2 fuel cell.

 $(6 \times 5 = 30)$ 

#### Part C

Answer any two questions.

Each question carries 10 marks.

- 22. What are the selections 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?

 $(2 \times 10 = 20)$ 

