(Pages : 4) **L – 1601**

Reg. No. : .....

Name : .....

Sixth Semester B.Sc. Degree Examination, March 2021.

First Degree Programme under CBCSS

Chemistry

Core Course – X

CH 1641 – PHYSICAL CHEMISTRY – II

(2017 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. Each question carries **1** mark:

1 Give one example for liquid-in-liquid colloid system

2 What is the selection rule for heterodiatomic molecule in rotational spectroscopy?

3 Name two properties of Colloids.

4 Give one example for ensembles.

5 What is BET equation?

6 What is the SI unit of energy?

7 What is the condition for a molecule to show vibrational spectroscopy?

8. What are overtones?

9. Define Hardy-Schulz rule.

10. Give the expansion of STM.

(10 × 1 = 10 Marks)

SECTION – B

Answer **any eight** questions. Each question carries **2** marks

11. What is chemical shift?

12. Give two applications of ESR spectroscopy.

13. What do you mean by optical exaltation?

14. What is Morse equation?

15. What is mean by partition function?

16. Define mutual exclusion principle.

17. Explain Lande splitting factor.

18. What is the term gold number?

19. Define photoelectric effect.

20. What are ensembles?

21. Explain Freundlich adsorption isotherm.

22. What is critical micelle concentration?

(8 × 2 = 16 Marks)

SECTION – C

Shod essay, Each question carries **4** marks. Answer **any six** questions

23. Describe the applications of NMR Spectroscopy.

24. Explain Nernst heat theorem.

25. Describe how surface area measured by BET equation.

26. Discuss quantum mechanical treatment for particle in 3D box.

27. Briefly describe application of rotational spectroscopy.

28. Describe one method for the measurement of dipole moment.

29. Compare physical adsorption and chemical adsorption.

30. Explain singlet and triplet state using suitable example.

31. Briefly describe different types of operators in quantum mechanics.

(6 × 4 = 24 Marks)

SECTION – D

Long essay (**15** Marks each) Answer **any two** question

32. (a) Briefly describe the properties of colloids.

    (b) Describe the application of colloids.

33. (a) Discuss the various rotational energy levels and selection rule for diatomic molecule.

    (b) Explain the shielding and deshielding mechanism in NMR.

    (c) Differentiate diamagnetic and paramagnetic substance using suitable example.

    (d) Explain Born- Oppenheimer approximations.

34. Give a short note on

(a) ESR Spectroscopy

(b) Mossbauer spectroscopy

(c) Parachor

35. Describe

(a) Boltzmann distribution

(b) Schrodinger wave equation

(c) Partition functions

(2 × 15 = 30 Marks)