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**Reg. No. : .....**

**Name : .....**

**Third Semester B.Sc. Degree Examination, October 2019**

**First Degree Programme under CBCSS**

**Complementary Course for Physics**

**CH 1331.1 – PHYSICAL CHEMISTRY II**

**(2017 Admission onwards)**

Time : 3 Hours Max. Marks : 80

SECTION – A

(Answer **all** questions. **Each** question carries **1** mark)

1. The expression for rms velocity is ————————
2. State the law of corresponding states.
3. Sketch the unit cell of bcc crystal.
4. CsCl has a bcc structure. How many $Cs^+$ and $Cl^-$ ions are there in the unit cell?
5. State Beer Lambert's law.
6. State Einstein's law of photochemical equivalence.
7. Write an example for photosensitisation.
8. Give an example for a reference electrode.
9. What is the point group of $NH_3$?
10. Give an example for a second order reaction.

**(10 × 1 = 10 Marks)**

**P.T.O.**

## SECTION – B

(Answer any **eight** questions. **Each** question carries **2** mark)

11. Define mean free path.

12. What is inversion temperature? Write an expression to find out inversion temperature.

13. What is a Bravais lattice.

14. At room temperature, sodium crystallises in a body centered cubic cell with a = 4.24 A°. Calculate the theoretical density of Sodium. Molar mass of sodium = 23.0 g $mol^{-1}$.

15. Define fluorescence.

16. Give the mathematic representation of Beer Lamberts law and write any one limitation of the law.

17. Define half-life of a reaction. Give expression to find out half-life of a first order reaction.

18. Write Arrhenius equation and explain the terms.

19. Illustrate the symmetry element proper axis of symmetry with an example.

20. Write an example for a molecule having $C_{3V}$ point group and list the symmetry elements in $C_{3V}$ point group.

21. Define standard electrode potential.

22. Write any two advantages of potentiometric titrations.

**(8 × 2 = 16 Marks)**

## SECTION – C

(Answer any **six** questions. **Each** question carries **4** mark)

23. Briefly describe joule Thomson effect.

24. Discuss homogenous and heterogenous catalysis.

25. Define rate of a chemical reaction and explain the factors affecting rate of reaction.

26. Discuss Michaelis Menten mechanism of enzyme catalysed reaction.

27. Explain the conductometric titrations of weak acid against strong base.

28. Write note on calomel electrode.

29. Write a note on the general characteristics of catalysis.

30. Explain the seven crystal systems.

31. Construct the group multiplication table of $C_{2V}$ point group to which $H_2O$ belongs.

**(6 × 4 = 24 Marks)**

## SECTION – D

(Answer any **two** questions. **Each** question carries **15** marks)

32. (a) Derive Braggs equation.

    (b) Write a detailed account of the structure of NaCl.

33. (a) Discuss the collision theory of reaction rates.

    (b) Explain are the differences between order and molecularity.

34. Define transport number and Describe the moving boundary method for determining the transport number.

35. (a) Define catalysis and discuss briefly the intermediate compound formation theory of catalysis.

    (b) Describe a method for the liquefaction of gases.

**(2 × 15 = 30 Marks)**

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