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Reg. No. : .....

Name : .....

Sixth Semester B.Sc. Degree Examination, April 2017
First Degree Programme Under CBCSS and Career Related
CHEMISTRY
Core Course
CH 1643/IC 1641
Physical Chemistry – III
(2013 Admission Onwards)

Time : 3 Hours Max. Marks : 80

SECTION – A

(Answer **all** questions. Answer in **one** word to maximum **two** sentences. **Each** question carries **one** mark).

1. What is the molecularity and order of inversion of cane sugar ?
2. Unit of second order reaction rate constant is
3. Write the equation which gives the activation energy of reactions.
4. Define CST.
5. Write an example for an azeotrope.
6. What is the change in the ionic product of water when 1 ml of 0.01 M HCl is added to water ?
7. Walden rule gives the effect of _____ on ionic conductance.
8. What is the potential of a standard hydrogen electrode ?
9. State reduced phase rule for a two component system.
10. Calculate the quantum yield of a reaction if the number of molecules reacting are 6×10^8 and number of quanta absorbed is 2×10^9. **(10×1=10 Marks)**

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SECTION – B

(Short answer type. Answer **any** 8 questions from the following. **Each** question carries **two** marks.)

11. What is steady state approximation ?

12. State Lindemann's theory of uni molecular reactions.

13. What is common ion effect ? Mention two applications.

14. Define buffer index.

15. Distinguish between congruent and incongruent melting point.

16. What is triple point in a phase equilibria of one component system ?

17. State Nernst distribution law.

18. What is Debye Falkenhagen effect ?

19. What are reference electrodes ? Give an example.

20. What is the relation between emf of a cell and free energy change of the cell reaction ?

21. Draw the miscibility temperature composition graph of Phenol-Water System.

22. What are photo sensitized reactions ? Give one example. **(8×2=16 Mark**

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SECTION – C

(Short essay type. Answer **any 6** questions from the following. **Each** question carries **four** marks.

23. Explain the hydrolysis of salts taking one example of each type.

24. In a first order reaction, it takes the reactant 40.5 minutes to be 25% decomposed. Calculate the rate constant of the reaction.

25. Explain the graphical method of determination of rate constant for a first order reaction.

26. Compare ferric chloride-water system and sodium sulphate-water system.

27. What are redox indicators ? Explain with an example.

28. What would be the pH of a solution obtained by mixing 5g of acetic acid and 7.5 g of sodium acetate and making the volume to 250 ml. Dissociation constant of acetic acid at 25° C is 1.75×10^{-5}.

29. Explain H_2-O_2 fuel cell.

30. Write notes on :

a) Fluorescence

b) Phosphorescence

31. Equivalent conductance at infinite dilution of Ammonium chloride, sodium hydroxide and sodium chloride are 129.8, 217.4 and 108.9 ohm^{-1}. Cm^2. Mol^{-1} respectively. If sp. Conductance of 0.01 molar ammonium hydroxide is 9.33×10^{-5}, calculate degree of dissociation of ammonium hydroxide. **(6×4=24 Marks)**

SECTION – D

(Essay type. Answer **any 2** questions from the following. **Each** question carries 15 marks).

32. Explain collision theory of reaction rates.

33. Explain the phase diagram of sulphur system.

34. What are transport numbers ? Explain the determination of it.

35. Give a detailed account of various conductometric titrations. **(15×2=30 Marks)**

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