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Name.....

Reg. No.....

SIXTH SEMESTER B.Sc. DEGREE EXAMINATION, MARCH/APRIL 2016

(UG—CCSS)

Chemistry—Core Course

CH6 B17—PHYSICAL CHEMISTRY—III

Time : Three Hours

Maximum : 30 Weightage

Section A

Answer all questions.

Each question carries $\frac{1}{4}$ weightage.

Fill in the blanks :

1. In a multistep reaction the _____ step is the rate determining step.
2. For a second order reaction the plot of _____ against time is a straight line.
3. The specific conductance of a strong electrolyte _____ with dilution
4. The quantum yield of a photochemical reaction is defined as _____.

Answer in a word or sentence

5. What is a concentration cell ?
6. Define transport number.
7. What is an opposing reaction ?
8. State the Lewis concept of acids.
9. Acid is always added during the making up of ferric salts. Why ?
10. Define solubility product.
11. What is overvoltage ?
12. Give the general format of if statement in C programming.

(12 \times $\frac{1}{4}$ = 3 weightage)

Turn over

Section B

Answer all questions.

Each question carries 1 weightage.

13. Distinguish between order and molecularity.
14. The standard electrode potential of Zn and Ag are -0.80 V and -0.76 V respectively. Calculate the, standard EMF of the cell $\text{Zn} | \text{Zn}^{2+} || \text{Ag}^+ | \text{Ag}$.
15. How will you express the units of rate constant for reactions of order zero, 1, 2, and 3 ?
16. What is a salt bridge ?
17. Give the Michaelis-Menton equation for enzyme catalysis.
18. What is chemiluminescence ?
19. The molar ionic conductance at infinite dilution of BaCl_2 , NaOH and NaCl are 280×10^{-4} , 248×10^{-4} , and $126 \times 10^{-4} \text{ S m}^2 \text{ mol}^{-1}$ respectively. Calculate the molar conductance at infinite dilution of $\text{Ba}(\text{OH})_2$ solution.
20. Explain buffer action with an example.
21. What are the rules for naming a variable in C language ?

(9 × 1 = 9 weightage)

Section C

Answer any five questions.

Each question carries 2 weightage.

22. How is pH measured using an electrochemical cell ?
23. Explain the Debye-Huckel theory of electrolytic solutions.
24. What are fuel cells ?
25. What are the applications of e.m.f. measurements ?
26. Distinguish between phosphorescence and fluorescence using Jablonski diagram.
27. Calculate the pH of a solution containing 10 g acetic acid and 15 g sodium acetate in 1 L. K_a of acetic acid is 1.75×10^{-5} .
28. Describe four applications of solubility product principle.

(5 × 2 = 10 weightage)

Section D

Answer any two questions.

Each question carries 4 weightage.

29. Describe the different methods for the determination of order of a reaction.
30. Describe any *four* applications of conductance measurements.
31. (a) What are the different types of electrodes ?
(b) Derive the Nernst equation for e.m.f. of a cell.

(2 × 4 = 8 weightage)