Reg. No……. Name…… **20U430**

B. Sc. DEGREE END SEMESTER EXAMINATION - MARCH 2020

SEMESTER – 4: CHEMISTRY (COMPLEMENTARY COURSE FOR PHYSICS)

COURSE: 15U4CPCHE4.1, ADVANCED PHYSICAL CHEMISTRY II

(For Regular - 2018 Admission and Supplementary / Improvement 2017, 2016, 2015 Admissions)

Time: Three Hours Max. Marks: 60

SECTION A

*Answer **all** questions, Each question carries **1** mark*

1. What is red shift and blue shift
2. Distinguish homogeneous and heterogeneous catalysis with examples.
3. What is half life period?
4. Give the unit of rate constant for a second order reaction?
5. Distinguish between bending and stretching vibrations
6. What is meant by solubility product?
7. Write an example for a salt of strong acid and weak base
8. Write the cell reaction involved in the $Zn/Zn^{2+}//H^{+}/H_{2(g)}$ /Pt (1 x 8 = 8)

SECTION B

*Answer **any six** questions, Each question carries **2** marks*

9. State Beer-Lambert's law
10. What the different types of electronic transitions?
11. Distinguish between fluorescence and phosphorescence
12. State Kohlaraschus law.
13. Determine the oxidation state of S in H_2SO_4 and C in CO_3^{2-}
14. Distinguish between chemical equivalent and electrochemical equivalent.
15. What is electrode concentration cell and electrolytic concentration cell.
16. Explain the law of photochemical equivalence. (2 x 6 = 12)

SECTION C

*Answer **any four** questions. Each question carries **5** marks*

17. How microwave spectroscopy can be used to determine the bond length of a diatomic molecule?
18. How much silver is deposited by passing a current a 4 amperes through a $AgNO_3$ solution for a period of 10 minutes(Atomic mass of Ag=108U).

19. Write two examples of photosensitized reactions.
20. Explain SHE and its significance.
21. Write the common vibrational frequency of following groups

    -OH, -NH_2, C=O, C-H, C-O.
22. Why catalyst increases the rate of the reaction? (5 x 4 = 20)

SECTION D

*Answer **any two** questions. Each question carries **10** marks*

23. Explain the different methods of determining the order of the reactions
24. Explain the determination of transport number by Hittorf's method
25. Write short notes on phosphorescence, fluorescence, photosensitized reactions.
26. Write a note on conductometric titrations. (10 x 2 = 20)

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