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PG (NEW) CBCS
M.Sc. Semester-III Examination, 2019
CHEMISTRY
PAPER: CEM-303
(INORGANIC SPECIAL)

Full Marks: 40 **Time: 2 Hours**

GROUP-A

Answer any four questions from the following: **4×2=8**

1. How photodecomposition of $Fe(C_2O_4)_3^{3-}$ occur?
2. Give an example of linkage photo isomerisation.
3. Draw the active site structure of cytochrome.
4. In the presence of air $[Fe(CN)_6]^{4-}$ in $CHCl_3$ is immediately oxidised to $[Fe(CN)_6]^{3-}$ in the dark.-Why?
5. What is catalytic converter?
6. Draw the active site structure of cobalamine.
7. Write down the criteria to be fulfilled by a compound for functioning as a good photosensitiser.
8. Draw the active site structure of electron carrier protein cytochrome P-450.

GROUP-B

Answer any four questions from the following: **4×4=16**

9. Describe the role of metal ions in DNA structure and genetic information transfer.
10. (a) Write various photochemical processes that occur in a molecule by unimolecular process.
    (b) Distinguish fluorescence and phosphorescence. 2+2
11. (a) What do mean by thexi state? Write the characteristic of this state.
    (b) What is the role of cerium salt in the process of photochemical splitting of water molecule?

(P.T.O)

12. (a) How can you distinguish between the static and dynamic quenching of fluorescence. 3+1

(b) What will the photochemical products of $[Cr(NH_3)_5(NCS)]^{2+}$ in 0.1(N) H_2SO_4. 2+2

13. Describe the photochemistry of Cr(III) in solid state laser system. 4

14. Briefly discuss the active site structure of superoxide dismutase and role of the enzyme.

15. Describe mechanistically the dismutation of superoxide by superoxide dismutase in human body. 4

16. Draw the active structure of ascorbic acid oxidase. 2+2

GROUP-C

Answer any <u>two</u> questions from the following: **8×2=16**

17. (a) Discuss the active site structure of catalase and explain the dispropornation of H_2O_2 by this enzyme. 2+3

(b) Which enzyme is playing a major role on the detoxification of sulphite compound? Draw its active site structure and indicate the steps involves in this conversion. 3

18. Describe the charge transfer to metal excited state photochemistry of $[Co(NH_3)_5Cl]^{2+}$ complex. 8

19. Draw Tanabe -Sugano diagram for Cr(III) octahedral complexes and describe associated photochemical process of $NH_4[Cr(NCS)_4(NH_3)_2]$ complex. 2+6

20. Describe the photochemical reduction and oxidation of water molecule using $[Ru(bpy)_3]^{2+}$ as photosensitiser. 8

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