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Total Number of Pages : 01

M.Sc.I
FCYC1001

10th Semester Regular Examination 2018-19
BIO-INORGANIC AND SUPRAMOLECULAR CHEMISTRY
BRANCH : M.Sc.I(AC)
Time : 3 Hours
Max Marks : 70
Q.CODE : F046

Answer Question No.1 which is compulsory and any FIVE from the rest.
The figures in the right hand margin indicate marks.

- Q1** Answer the following questions : (2 x 10)
- a) Write the functions of carbonic anhydrase enzyme.
 - b) Give two examples of podands with their structures.
 - c) What do you mean by molecular recognition?
 - d) State the functions of siderophores and write their functional groups.
 - e) Write the importance of DPG in hemoglobin.
 - f) What is SOD?
 - g) Why deficiency of cobalamin causes pernicious anemia?
 - h) State the biological functions of xanthine oxidase enzyme.
 - i) What do you mean by biomineralisation? Give an example of it.
 - j) Draw the structure of 14<N₄2₂3₂ corand-4> and 18 (O₃N₃2₆ corand-6>.
- Q2**
- a) Discuss the structure and biological functions of ferritin and transferrin. (6)
 - b) Discuss the variation of binding constants of Li⁺, Na⁺ and K⁺ ions in simple podands and crown ethers. (4)
- Q3**
- a) What is cytochrome P-450? How do you justify its name? Discuss its structural properties. (1+2+4)
 - b) How does the chlorine ring differ from the porphyrin ring? (3)
- Q4**
- a) Discuss the structural features and functions of hemoglobin. (6)
 - b) Describe the general functions of catalase and peroxidase. (4)
- Q5**
- a) Discuss the structural features of Cu, Zn-SOD. Discuss the mechanism of its activity. (6)
 - b) Describe the structural features of ferredoxins (Fd). (4)
- Q6**
- a) Explain the role of Mg(II) in chlorophyll. (7)
 - b) Describe the role of P-clusters in FeMo-protein in biological nitrogen fixation. (3)
- Q7**
- a) Discuss the function of PS-I (P-700) and PS-II (P-680) in photosynthetic activity. (7)
 - b) Describe the synthesis and applications of cyclodextrins. (3)
- Q8**
- a) Describe various methods for synthesis of crown ethers. (5)
 - b) Discuss the structural features of hemerythrin and their role in oxygen transport. (5)