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(FOR THE CANDIDATES ADMITTED **20PCY412**

DURING THE ACADEMIC YEAR 2020 ONLY) **REG.NO. :**

N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI

END-OF-SEMESTER EXAMINATIONS: JULY 2022

M.Sc.-CHEMISTRY **MAXIMUM MARKS: 70**

SEMESTER-IV **TIME : 3 HOURS**

INORGANIC CHEMISTRY – III: BIOINORGANIC AND INNER TRANSITION ELEMENTS

SECTION - A (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS.

MULTIPLE CHOICE QUESTIONS. (K1)

1. What happens to the atomic size of the lanthanides with increase in atomic number?
   a) The radius remains unchanged b) The radius decreases
   c) The radius increases d) The radius first increases and then decreases
2. Ziegler-Natta catalysis is associated with _____.
   a) alkene hydrogenation b) alkene polymerization
   c) hydroformylation of alkenes d) alkyne metathesis
3. What is the oxidation state of Rh in Wilkinson's catalyst?
   a) +1 b) +2 c) +3 d) +4
4. How much ATP does Sodium-Potassium pump consume?
   a) three fourth b) one fourth c) one third d) half
5. Myoglobin is_____
   a) Tetramer b) Trimer c) Dimer d) Monomer

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES (K2)

6. Which of the actinoids is used as a nuclear fuel?
7. What is isomerization?
8. Define photochemistry?
9. In Biological system, what are the metal ions involved in electron transport?
10. What type of ligand structure present in Vit-B12?

SECTION – B (5 X 4 = 20 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)

11. a) Compare and Contrast Lanthanides and Actinides.

(OR)

b) Explain about complex formation of lanthanides.

12. a) Describe the structure and the importance of Vaskas Complex.

(OR)

b) Sketch and show the catalytic cycle of Olefin hydrogenation process.

(CONTD …. 2)

13. a) Describe the oxidative addition in 4-coordinate 16- electron reactants.

(OR)

b) Examine the CO insertion reactions with suitable example.

14. a) Show the importance of calcium in muscle contraction and blood clotting.

(OR)

b) Outline the importance of copper proteins.

15. a) Describe the importance and structural features of ferridoxin and rubredoxin.

(OR)

b) Sketch the structure of carboxy peptidase and explain how the catalytic reaction happens with the help of it.

SECTION - C (4 X 10 = 40 MARKS)

ANSWER ANY FOUR OUT OF SIX QUESTIONS. (K4 (Or) K5)
(16th QUESTION IS COMPULSORY AND ANSWER ANY THREE QUESTIONS (FROM Qn. No : 17 to 21)

16. Enumerate the biological nitrogen fixation reaction.

17. Criticize the magnetic properties of lanthanides and actinides.

18. Discuss the Zieglar- Natta Catalysis process and determine the product with suitable cycle.

19. Analyze the role of $[Ru(bipy)_3]^{2+}$ complexes in solar energy.

20. Outline the importance of sodium potasium pump with neat sketch for mechanism.

21. Discuss the role of cis-platin in cancer therapy.

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