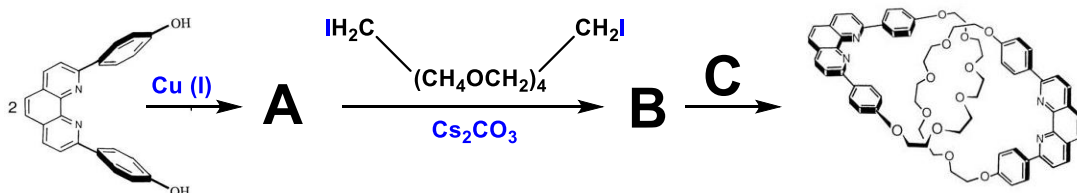


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PG CBCS
M.Sc. Semester-III Examination, 2021
CHEMISTRY
 PAPER: CEM 303
 (ORGANIC SPECIAL)

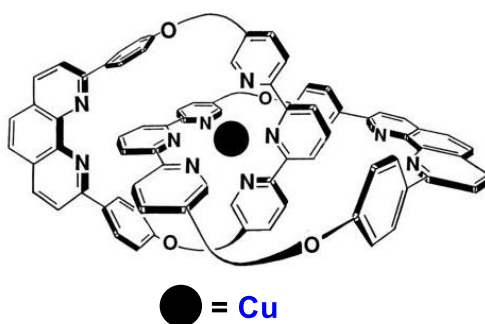
Full Marks: 40**Time: 2 Hours****Answer any FOUR questions from the following:****4 X 10=40**

1. (a) Why fat molecules tend to clump up in water rather than distribute? Explain
 - (b) What are the differences between van der Waals force and hydrophobic interaction?
 - (c) Arrange the following forces/interactions in the increasing order of strength
 - i) Hydrogen bonding; ii) van der Waals force; iii) Covalent bonding
 - (d) Explain the formation of different co-crystals in polar and non-polar solvents. 2+3+2+3
2. (a)



Identify A, B and C in the above reaction scheme.

(b)



Determine the geometry and coordination number of Cu.

- (c) Mention **THREE** advantages of Laser Ablation Method over the Arc Discharge Method for the preparation of carbon nanotubes. 5+2+3
3. (a) What are the two models to describe multi-walled nano tubes (MWNTs).
- (b) What is cryptate effect? Explain with a suitable example.

(P.T.O.)

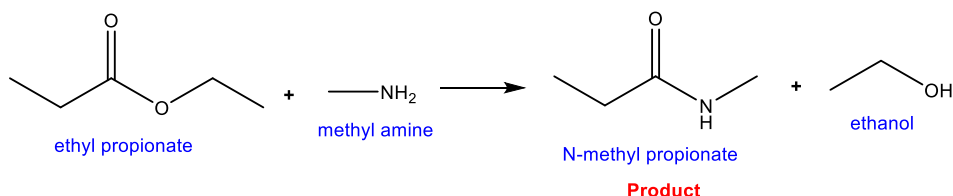
(2)

(c) Both cyclodextrins and crown ethers have inner cores and outer surface. Which one have hydrophilic inner core and why?

(d) How crown ethers work as phase transfer catalyst? Explain with a representative example. 2+2+2+4

4. (a) Why catalytic reactions are preferred to stoichiometric reaction from the Green Chemistry point of view? Explain.

(b) Calculate the Atom Economy of the following reaction:



(c) Write a brief note on any five principles of Green Chemistry 3 + 2 + 5

5. What are Dendrimers? Write some important properties of Dendrimers. What are the different types of Dendrimers? Give examples. 2+3+5

6. What are essential and nonessential aminoacids? Give examples. Describe the resin based solid phase synthesis of peptide. The pKa values for the three groups X,Y,Z of aspartic acids are 2.09, 3.86 and 9.82 respectively. Show the base pairing in DNA. 2+1+3+2+2

7. What is peptide bond? Describe solid phase synthesis of peptide. What is nucleic acid? What are nucleotides? 2+4+2+2

8. Write the names and structures of nitrogen bases present in DNA. Show the base pairing with structure in DNA. Write Watson and Crick model of DNA. 2+2+2+4

9. Describe secondary and tertiary structures of protein. What is Simple protein and Conjugate protein? Give example. 2+5+2+1

10. Describe the replication process of DNA. Describe the types of RNA and their functions.

6+4
