

Total page: 1

**PG (CBCS)**  
**M.Sc. Semester-III Examination, 2020**  
**CHEMISTRY**  
 PAPER: CEM 303  
 (Organic Special)

**Full Marks: 40****Time: 2 Hours****Answer any four questions:****10X4=40**

1. (a) What do you mean by atom economy of a chemical reaction? Illustrate with an example.  
 (b) What is meant by molecular recognition?  
 (c) What is hydrophobic effect?  
 (d) Write names and structures of two host molecules for the recognition of cations     2.5×4
  
2. (a) Write the Ion-transport mechanism through membranes.  
 (b) Show the kinetic study of the effect of various cations on the template synthesis of benzo[18]crown-6.     5+5
3. Write down the mechanistic procedure of dye-sensitized solar cell with suitable diagram.     10
4. Discuss at least four environmental hazards/disasters that make the people believe that chemistry is fouling the planet.     10
5. Write a note each on (a) micelles (b) reverse micelles (c) vesicles (d) fibers (e) tubules.     2x5
6. (a) Write a note on binding affinity of crown ether to different cations.  
 (b) Write the names and structures of nitrogen bases present in DNA. Write Watson and Crick model of DNA.     5+2.5+2.5
7. Discuss structure, properties and applications of cyclodextrins.     10
8. What is a molecular sensor? What are catenanes? Describe the structure of RNA.     2.5+2.5+5
9. Describe the replication process of DNA. What is the isoelectric point of an amino acid? Give one example of each acidic, basic and neutral amino acids.     5+2.5+2.5
10. Which are essential and nonessential amino acids? Give examples. Describe the resin based solid phase synthesis of a 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.     2.5+3+2.5+2

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