

**M. Sc. (CHEMISTRY) EXAMINATION, 2022**

( 4th Semester, CBCS )

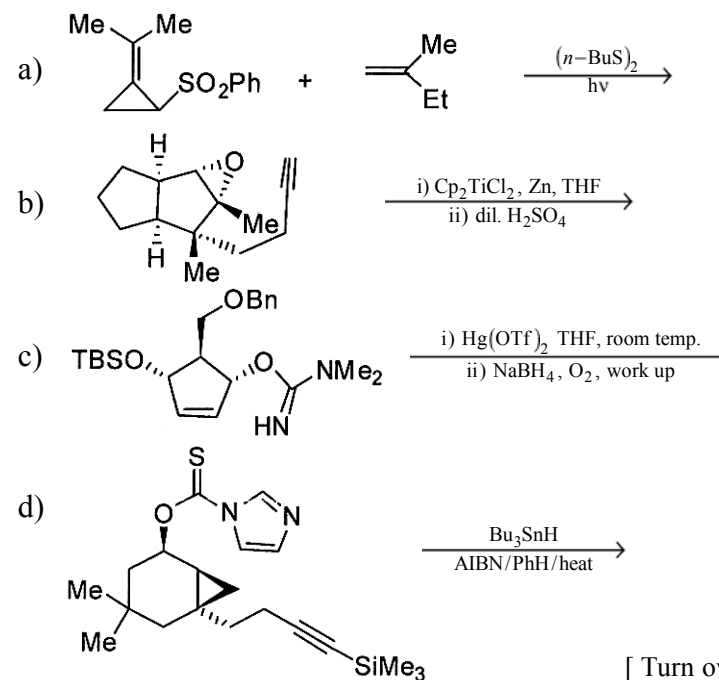
**ORGANIC CHEMISTRY SPECIAL****PAPER – XIII-O**

Time : Two hours

Full Marks : 40

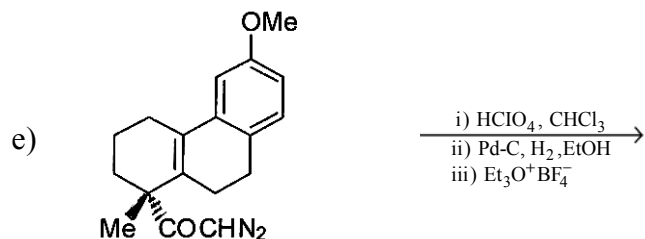
**(20 marks for each unit)****Use a separate answer script for each Unit.****UNIT: O-4131**

1. Predict the product(s) with proper stereochemistry in the following reactions and explain their formation with plausible mechanism (answer any *three*): 4×3

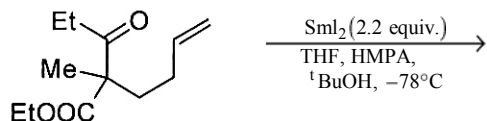


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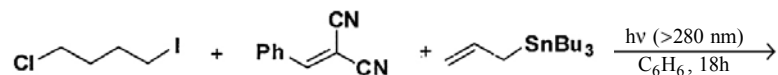
[ 2 ]



2. a) Write short notes on Barton McCombie reaction [reaction with example and limitations]. 2
- b) Identify the major product with probable mechanism. Discuss the role of HMPA in the reaction given below. 2+1



- c) Predict the products and explain with plausible mechanism. 3



### UNIT: O-4132

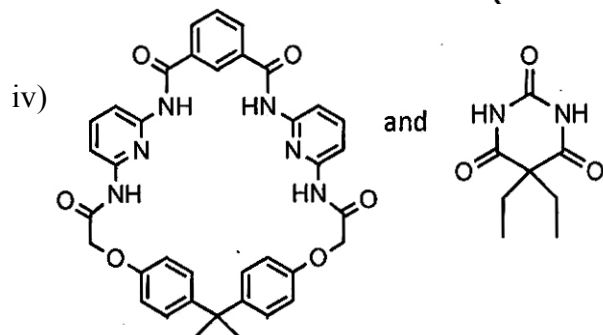
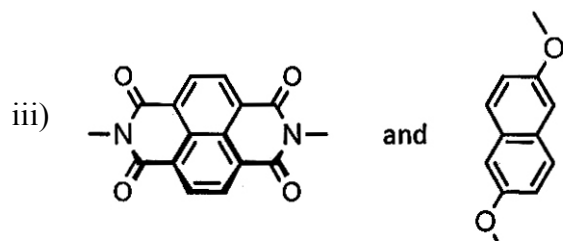
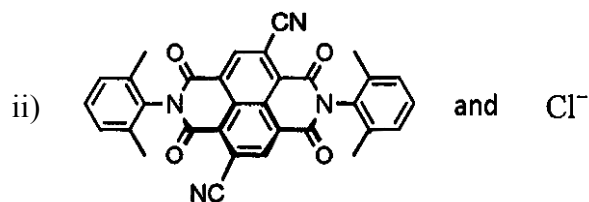
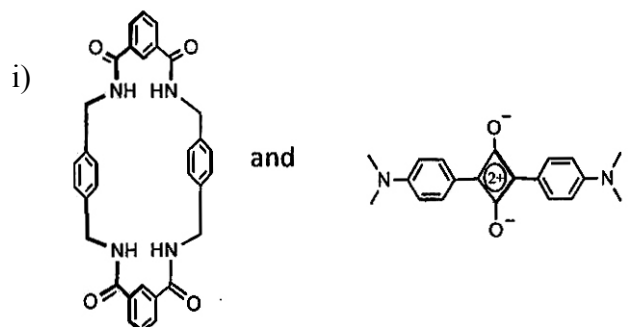
3. Write down the role of SNARE protein in biological membrane fusion? What type of combination in the following recognition moieties (A-D) will you use at the water-lipid interfacial region to obtain artificial membrane fusion and why? How will you utilize

[ 5 ]

6. The quadrupole moment ( $Q_{zz}$ ) of hexafluorobenzene is highly positive — justify. 1
7. Write down Yukawa-Tsuno equation and explain each term. Explain the solvolysis mechanism of *p*-substituted cumyl chloride which exhibits 'r = 1' and 'ρ = -4.52'. 2+1

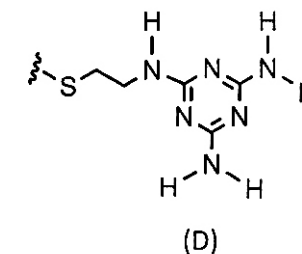
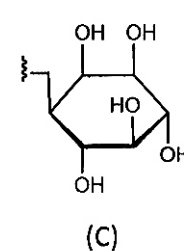
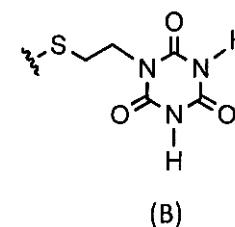
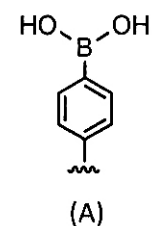
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5. What types of noncovalent interactions present in the following molecules? 1+1+1+1

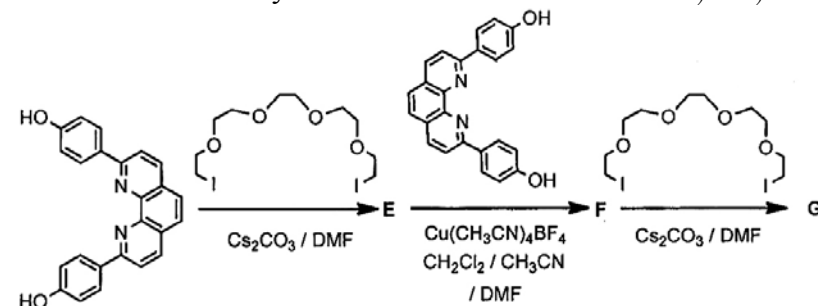


[ 3 ]

- supramolecular chemistry for artificial membrane fusion mediated targeted drug delivery? 2+2+1



4. What are the strategies will you use to synthesize mechanically interlocked molecules? Draw the structures of **E-G** in the following reaction. Give an example of rotaxane-based pH sensitive molecular shuttle with appropriate explanation. Draw the structure of a catenane molecule where rotation of a ring within another ring can be observed by suitable external stimuli. 2+1½+1½+2



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