



**ATTEMPT THIS PAPER ON THIS QUESTION SHEET ONLY.**

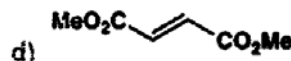
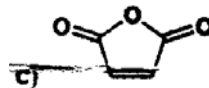
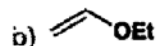
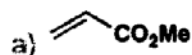
**Division of marks is given in front of each question.**

**This Paper will be collected back after expiry of time limit mentioned above.**

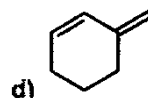
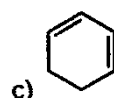
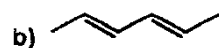
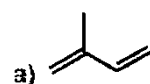
**Q.1. Encircle the correct option.**

**(10x1=10)**

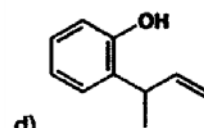
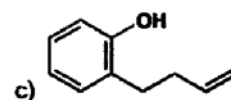
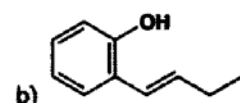
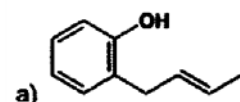
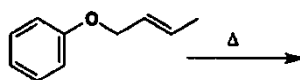
i. Which of the following dienophiles is the most reactive with buta-1,3-diene?



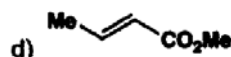
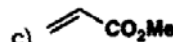
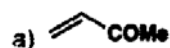
ii. Which of the following dienes cannot undergo Diels-Alder reactions?



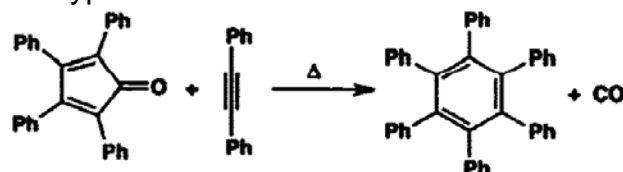
iii. Which of phenols (a)-(d) is the main product of the following thermal rearrangement?



iv. Which of the following dienophiles is the most reactive in normal Diels-Alder reactions?



v. The following involves two pericyclic reactions. Which combination indicates correctly the types of reaction involved?



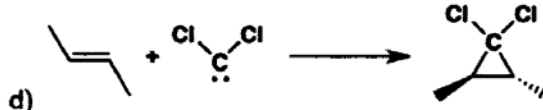
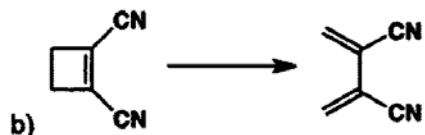
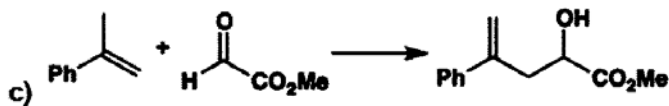
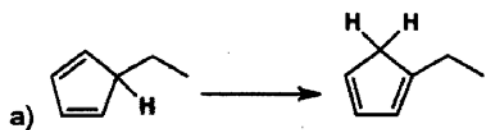
a) [4+2] cycloaddition + [2+2] cycloreversion

b) cheletropic reaction + [4+2] cycloaddition

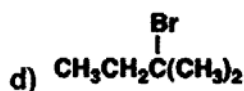
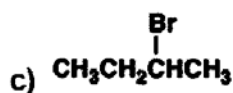
c) [4+2] cycloaddition + [4+1] cycloreversion

d) [4+2] cycloaddition + cheletropic reaction

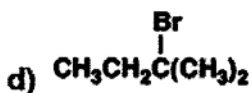
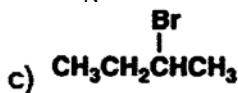
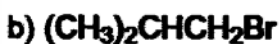
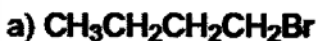
vi. Which of the following is classified as an electrocyclic reaction?



vii. Which is the most reactive compound by the S<sub>N</sub>2 mechanism?



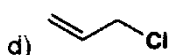
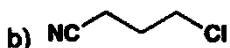
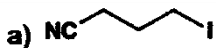
viii. Which is the least reactive compound by the S<sub>N</sub>2 mechanism?



ix. Which of the following statements is wrong?

- a) S<sub>N</sub>1 reactions undergo partial inversion of configuration.
- b) S<sub>N</sub>2 reactions undergo partial inversion of configuration.
- c) The rate constant of an S<sub>N</sub>1 reaction depends on the solvent.
- d) The rate constant of an S<sub>N</sub>2 reaction depends on the solvent.

x. Which is the main product of the following reaction?

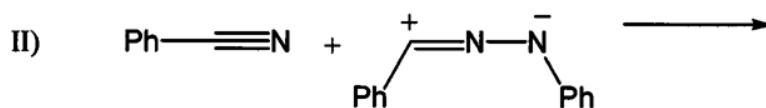
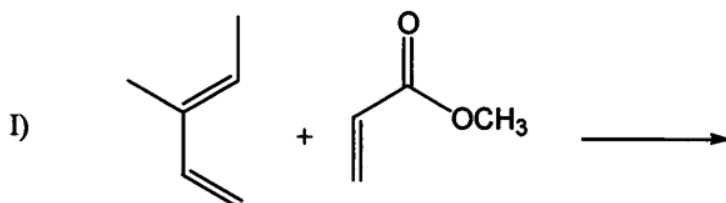




**ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED**

Q.2. Answer the following questions. (4x5=20)

- A) Draw the all possible products of following cycloaddition reactions and indicate the major product? [5]



- B) What are the different types of phase transfer catalysts? Explain how they work? [5]  
C) What are 1,3 dipolar cycloaddition reactions? Give two examples. [5]  
D) Give mechanism and example of [2, 3] wittig rearrangement. [5]

Q.3. Answer the following questions. (3x10=30)

- A) What are protecting groups? Describe the addition and removal of three different protecting groups for carboxylic acids. [10]  
B) Explain Merrifield Solid-Phase Peptide Synthesis. Describe all steps involved. [10]  
C) By using energy level correlation diagram how can you explain that thermal electrocyclic reactions involving  $4n$  electrons proceed in a conrotatory fashion while thermalelectrocyclic reactions involving  $4n+2$  electrons proceed in a disrotatory fashion? [10]