



THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Write short answers to the following questions. (6x5=30)

- I. How can you explain the fact that Aryl silanes undergo ipso substitution with electrophiles?
- II. Write two methods for the protection and deprotection of carboxylic acids in chemical reaction.
- III. What is phase transfer catalysis? Describe how crown ethers can be used for phase transfer catalysis?
- IV. How can you synthesize propan-1-ol from propene? Write complete reaction.
- V. What are synthon and synthetic equivalent in disconnection approach? Give example.
- VI. How would you differentiate between singlet carbene and triplet carbene? Explain their structures.

Write detailed answers to the following questions.

Question # 2.

- A. By using frontier molecular orbital (FMO) approach explain that thermal electrocyclic reaction of conjugated polyene with $4n \pi$ electrons would proceed through conrotation while photochemical electrocycloaddition of same polyene would prefer disrotation. [6]
- B. Give two examples of 1, 3 dipolar cycloaddition reactions. Write complete mechanisms. [4]

Question # 3.

- A. What are different methods for the generation of nitrene? [5]
- B. Explain why benzyne are very reactive? [2]
- C. Describe important requirements to operate benzyne mechanism. [3]

Question # 4.

- A. What is solid-phase synthesis? Explain complete procedure with example. [6]
- B. Explain the chemical utility of Phosphorus ylides. [4]