

2017

CHEMISTRY

Paper : 402 (O)

ORGANIC SYNTHESIS

Full Marks: 80

Time: 3 hours

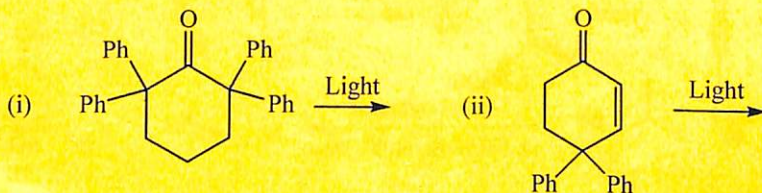
The figures in the margin indicate full marks for the questions

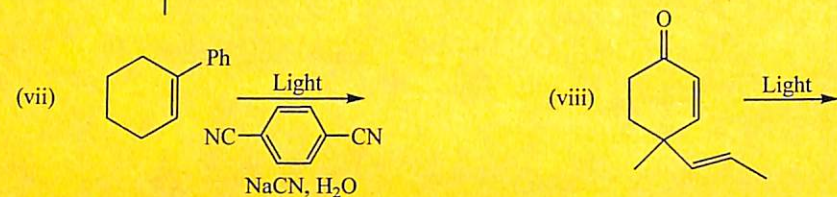
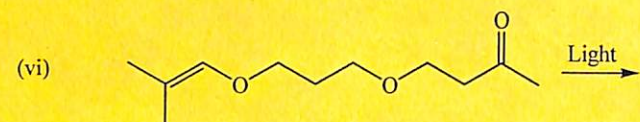
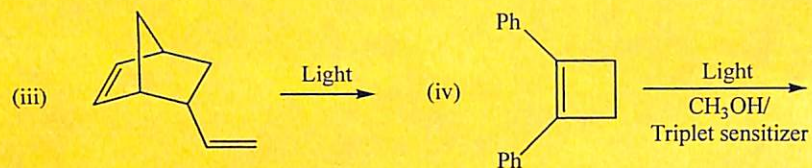
1. Answer the following questions

- a. What do you mean by photoisomerization and photocycloaddition of benzene? 4
- b. What do you mean by the following reactions? Give two examples for each reaction. (*Answer any four*)
2×4=8

- (i) Paterno-Buchi reaction
- (ii) Aza di- π -methane rearrangement
- (iii) Barton rearrangement
- (iv) Norrish type I reaction
- (v) Oxa di- π -methane rearrangement

- c. What will be the products of the following reactions? 1×8=8





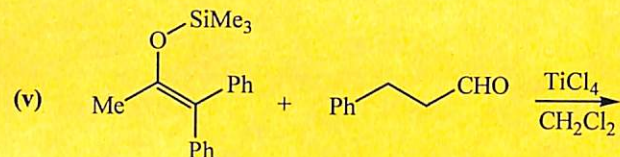
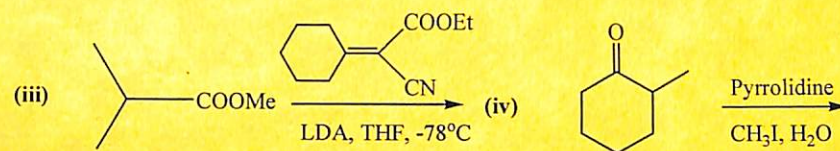
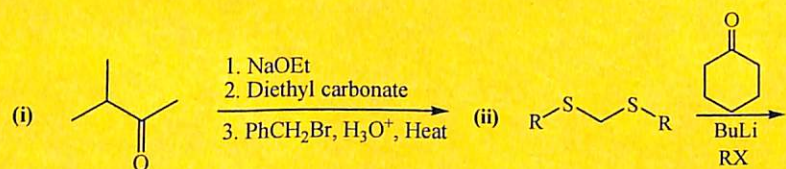
2. Answer the following questions

3×5=15

a. *Anti*- and *Syn*- periplanar eliminations are seen in Peterson reactions. Explain with examples? 5

b. What do you mean by umpolung of aldehydes? How singlet and triplet carbenes can be generated? Write their reactions. 2+3

c. Write the products of the following reactions. 5



3. Answer the following questions (Any two)

2×5=10

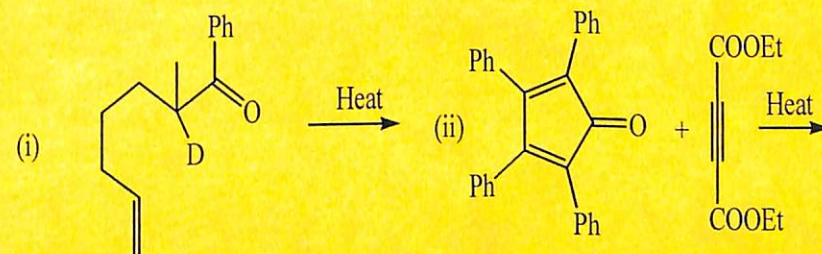
a. What do you mean by 1,3-dipolar cycloaddition reaction? How they are classified on the basis of FMO theory? Explain. 1+4

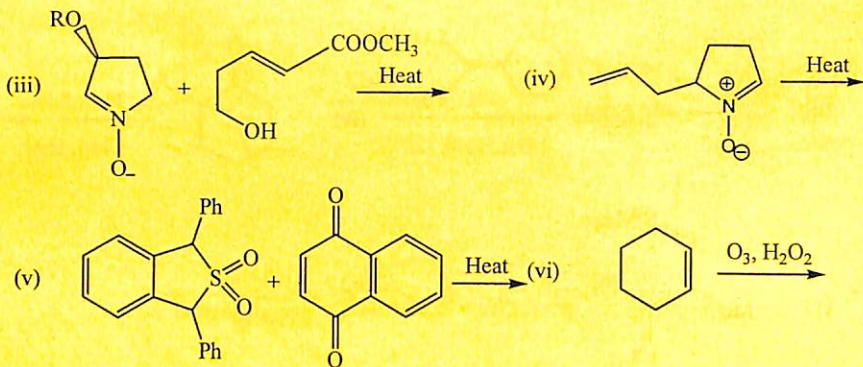
b. What do you mean by dyotropic rearrangements? Explain with examples. 5

c. What are Ene and Retro-Ene reactions? Ene reaction is a thermally suprafacial favoured reaction. Explain. 2+3

4. Answer the following question

a. What will be the products of the following reactions? (Any five) 2×5=10





5. Answer the following questions (Any three) $3 \times 5 = 15$

- How singlet and triplet nitrenes can be generated? Write their various reactions. $2+3$
- What are Sonogashira coupling reaction and Heck reaction? Give at least two examples of each reaction. $2\frac{1}{2} + 2\frac{1}{2}$
- What do you mean by Hofmann–Loeffler–Freitag reaction? Write the mechanism and applications of the reaction. $1+2+2$
- What are organocopper reagents? How they are prepared? Write the synthetic uses of organocopper reagents. $1+1+3$

6. Write the products of the following reactions $1 \times 10 = 10$

