

M.Sc. (Part-II) Semester-III (C.B.C.S.) Examination

CHEMISTRY (OLD)

Paper—XI

(Organic Chemistry—I)

Time : Three Hours]

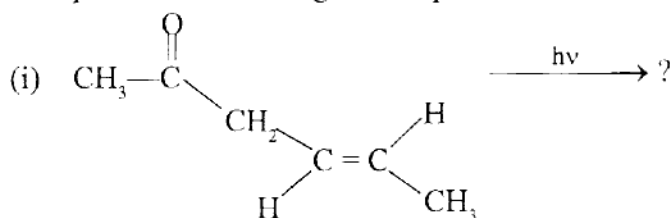
[Maximum Marks : 80

Note :— ALL questions are compulsory and carry equal marks.

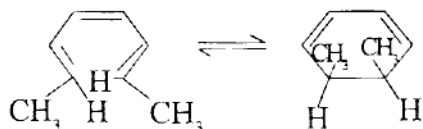
1. (a) Discuss the mechanism of the photoreduction of benzophenone leading to the formation of benzpinacol. 5
- (b) What is meant by quantum yield ? Explain with suitable example. 5
- (c) Comment upon the following :
(a) Norrish type I reaction
(b) Paterno-Buchi reaction. 6

OR

- (p) Draw the Jablonski diagram and explain :
(i) Fluorescence
(ii) Inter system crossing
(iii) Phosphorescence. 6
- (q) Complete the following and explain :



- (r) What is the role of photosensitizer in photochemical reaction ? Illustrate your answer with suitable example. 5
2. (a) What is sigmatropic rearrangement ? Explain Cope and Claisen Rearrangement. 6
- (b) On the basis of FMO method explain the following process : 5

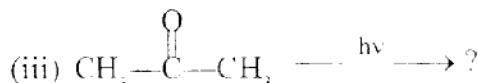
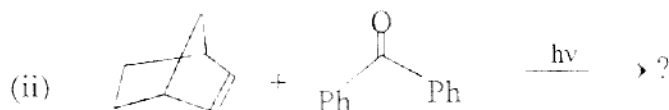
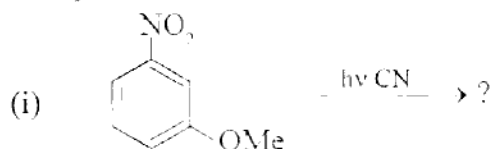


- (c) Comment on :
(i) 1, 3 dipolar cycloaddition
(ii) Symmetry properties of Butadiene. 5

OR

(p) When benzene is irradiated at 254 nm which isomers are formed ? Describe. 6

(q) Complete the following :



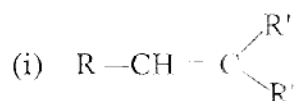
(r) Comment on :

(i) Photochemistry of enones and

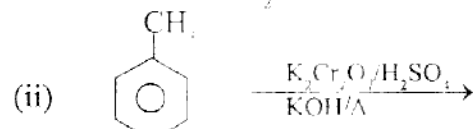
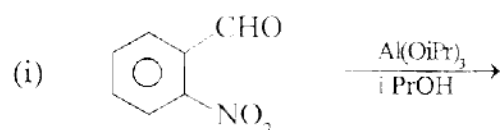
(ii) Photofries rearrangement. 6

3. (a) Discuss the reduction of nitro and nitroso compounds. 5

(b) How can you distinguish between the following alkenes by using ozone ?



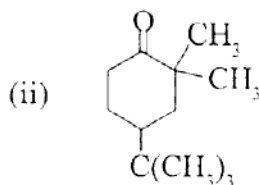
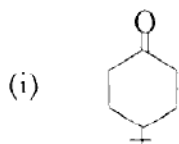
(c) Explain the reduction/oxidation of following compounds :



OR

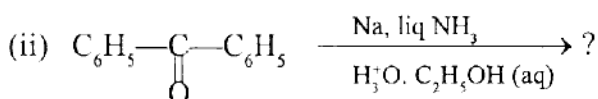
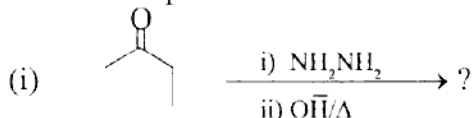
(p) Explain the oxidation of alkyl side chain in aromatic compounds, alcohols using $\text{CrO}_3(\text{H})$ with example. 6

- (q) Indicate the stereochemistry of major alcohol that would be formed by sodium borohydride reduction of each of the cyclohexanone derivatives :



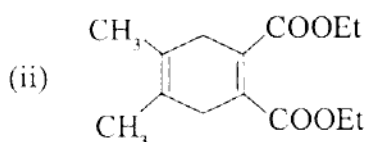
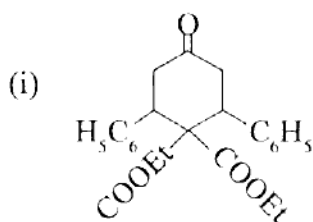
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- (r) Predict the product with mechanism :



5

4. (a) Design the synthesis of the given molecule with synthons :



6

- (b) Comment on :

(i) Claisen condensation

(ii) Perkin reaction.

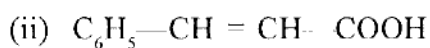
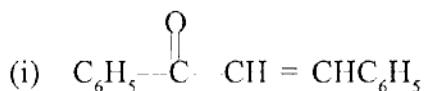
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- (c) Discuss the synthetic applications of aceto acetic esters (any four).

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OR

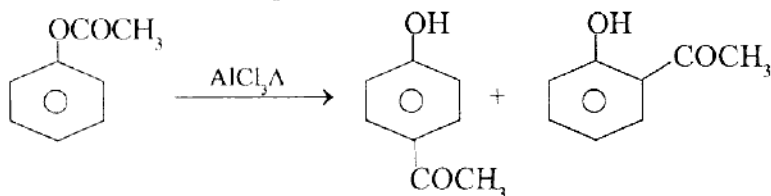
- (p) Write the steps involved in the retrosynthesis of following :



6

- (q) Name the reaction and give its mechanism :

5



3

- (r) Discuss in brief :
- Stobbe's condensation
 - Friedal Craft acylation.
5. (a) Explain how sulphur ylides are generated ? Give its synthetic applications. 5
- (b) Explain the dipole inversion and suggest the mechanism for the given reaction : 5



- (c) What are imines and enamines ? Give the synthetic applications of enamines. 6

OR

- (p) How would you employ enamines in the following transformations ? Explain. 4



- (q) What are Wittig reagents ? Discuss its reaction with aldehyde and ketones with mechanism. 7
- (r) Comment on the following :
- Umpolung concept
 - Sulphur ylides.
- 5