

C 31394

(Pages : 3)

Name.....

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE EXAMINATION, DECEMBER 2017

(CUCSS)

Chemistry

CH 3C 11—REAGENTS AND TRANSFORMATIONS IN ORGANIC CHEMISTRY

(2015 Admissions)

Time : Three Hours

Maximum : 36 Weightage

Section A

Answer all questions

Each question carries 1 weightage.

1. What product would form by reacting 2-hexanone with PhCOOOH in dichloromethane ?
2. Which reduction reaction can be used to convert cyclohexanone directly to cyclohexane ?
3. Identify the product formed from cyclohexene upon reaction with NBS in presence of Ph-CO-O-O-CO-Ph, What is the mechanism ?
4. Between tetramethylammonium bromide and tetra-*n*-butylammonium bromide, which one can be used as a better phase transfer catalyst and why ? Explain.
5. Explain, with an example each, what are linear, branched, cross linked and network polymers.
6. Write the structure of the sugars present in RNA and DNA. How does these sugars affect the stability of the RNA and DNA respectively.
7. Suggest a reaction by which oxiranes may be obtained from alkenes.
8. How can aziridines be obtained from 2-aminoalcohols ?
9. Comment on the aromaticity of five membered, monoheteroatom containing heterocycles.
10. Identify the product(s) that would form from C₆H₅-CO-C₆H₄-Br-*p* upon being subjected to Baeyer-Villiger reaction? How do these form? Which is the major product ?
11. How can you transform an oxo group >C=O to a >C=CH₂ group ?
12. What product would form if 2-bromocyclooctanone is subjected to Favorski rearrangement reaction ? How does the product form ?

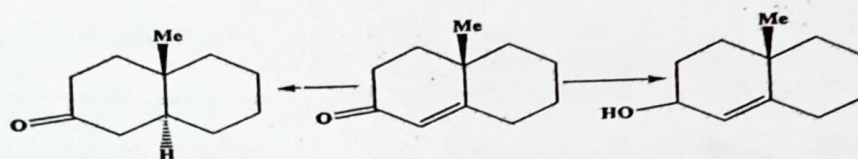
(12 × 1 = 12 weightage)

Turn over

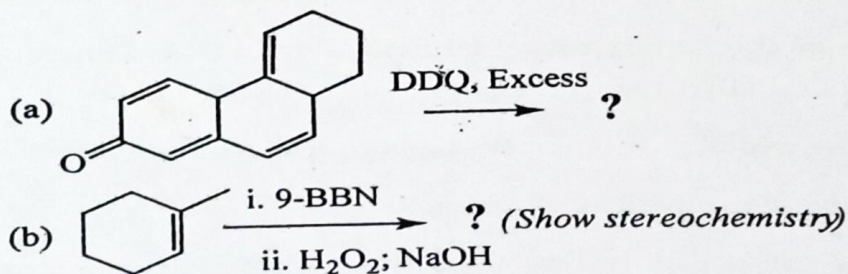
Section B

Answer any **eight** questions
Each question carries weightage 2.

13. Using mechanistic steps, explain the role of sulfur ylide in Swern oxidation.
14. Identify the product from Riley oxidation of propylene. What are the reagent used, reaction condition and mechanism?
15. Identify the product that would form in the Birch reduction of (i) anisole and (ii) benzoic acid respectively. Write the mechanism.
16. Suggest appropriate reagents for the reduction of the enone, shown below in the middle, to the two compounds shown on its either side. The reductions must be chemoselective.



17. What product would form in the following reactions ?



18. Explain, with one example each, the use of (i) EtO-CO-C≡C-CO-OEt (DEAD), (ii) (NH₄)₂Ce(NO₃)₆, (CAN), (iii) Bu₃SnH and (iv) Pb(OAc)₄ in synthesis.
19. Illustrate with examples the synthetic uses of (i) DCC and (ii) Me₂LiCu
20. How can synthetic rubbers be synthesized ? What are their properties?
21. What are the major ionic polymerization reactions ?

22. Describe the chemical steps involved in the Merrifield solid phase peptide synthesis of a dipeptide $\text{H}_2\text{N-Gly-Phe-COOH}$.
23. Explain how the parent ring system of pyrazole and imidazole may be synthesized.
24. Describe the rearrangement reactions of the acyl nitrene of the type R-CO-N:

(8 × 2 = 16 weightage)

Section C

Answer any two questions

Each question carries weightage 4.

25. Write brief notes on (i) Sharpless asymmetric oxidation and (ii) Prevost and Woodward hydroxylations.
26. Describe the catalysts and conditions used in heterogeneous and homogeneous catalytic hydrogenations. Explain the stereoselectivity that can be achieved.
27. Write the synthesis of (i) indole, (ii) quinoline ; (iii) uracil and (iv) caffeine
28. Discuss the Pd catalysed, named, coupling reactions as a synthetic methods.

(2 × 4 = 8 weightage)