

D 6819-A

(Pages : 3)

Name..

Reg. No

THIRD SEMESTER M.Sc. DEGREE EXAMINATION, DECEMBER 2016

(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. Identify the product arising from the reaction of **1-methoxycyclohex-1-ene** with O_3 in presence of **dimethylsulfide**.
2. How can **4-tert-butylcyclohexanone** be selectively reduced to **trans-4-tert-butylcyclohexanol** predominantly ?
3. Identify the isomeric products that can be expected from styrene by its reaction with **9-BBN** followed by oxidation with alkaline hydrogen peroxide. Which would be the major product and why ?
4. Write the structure of crown ethers that would complex with **Na** and K ions selectively. What are the synthetic uses of these complexes ?
5. Describe the mechanism of free radical polymerisation reactions.
6. Explain the general structure of block and graft copolymers.
7. How can **1-azetidine** carboxylic acid be obtained from **γ -aminobutyric acid** ?
8. Write a method by which styrene can be converted to **2-phenyloxirane**.
9. Write a synthesis of **indole**.
10. Write the mechanism of Wolff rearrangement.
11. Upon reaction with **perbenzoic acid**, **4-MeO-C₆H₄-CO-Ph** gets converted to mainly **PhCO-O-C₆H₄-OMe-4**. What is the mechanism ?
12. What product would form upon Beckmann rearrangement reaction from **cyclohexyl methyl ketone** **CH₃-CO-C₆H₁₁** ? How ?

(12 x 1 = 12 weightage)

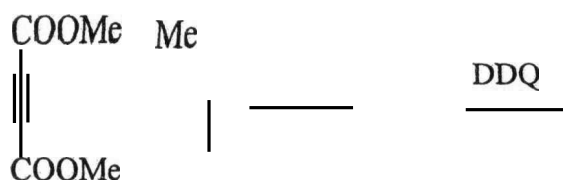
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Section B

Answer any eight questions.

Each question carries *weightage* 2.

13. Which product would form by the reaction of $\text{CF}_3\text{-CO-OOH}$ with Me-CO-Chx (where Chx is cyclohex-1-yl) in CH_2Cl_2 . What is the mechanism of the reaction ?
14. What are the advantages of $\text{CrO}_3\text{-pyridine}$ reagent as an oxidant ? Which **product(s)** would form in the oxidation of $\text{Me}_2\text{C=CH-CH}_2\text{-CH}_2\text{-CH}_2\text{-OH}$ with $\text{CrO}_3\text{-2Py}$?
15. Comment on the reduction of : (i) Cyclohexanone and (ii) Cyclohex-2-en-1-one with one equivalent of NaBH_4 . Identify the product in each case.
16. Explain **Noyori** asymmetric hydrogenation with an example.
17. Identify the product A and B in the following reaction scheme :



18. What are phase transfer catalysts ? What are their typical structure ? Illustrate their application in synthesis with a specific example.
19. How can a **dithiane** be obtained from PhCHO ? What would happen this 2-phenyl-1, 3-dithiane is further reacted with MeBr in presence of a $n\text{-BuLi}$ followed by hydrolytic work up in presence of HgO ?
20. Describe the structure and properties of natural and synthetic rubbers.
21. Comment on the advantages of solid phase peptide synthesis.
22. Describe the amino, carboxyl and **hydroxy** protecting groups used in peptide synthesis. How are these introduced and removed ?
23. Comment on the ring **substitution** reactions of **pyrrole** and pyridine.
24. (a) Cycloheptanone was **monobrominated** and the product was reacted with dry EtOH-NaOEt . What would be the final product ? How does it form ?
(b) What is Peterson reaction ?

(8 x 2 = 16 weightage)

Section C

Answer any **two** questions.

Each question carries *weightage* 4.

25. Describe with examples the mechanism, selectivity and use of the following oxidations :
(i) **Dess-Martin** oxidation ; (ii) Jacobsen **epoxidation** ; (iii) Riley oxidation ; and (iv) **Swern** oxidation.
26. Discuss the use of alkali metals in organic reductions in **variuos** reaction media including liquid ammonia.
27. What are the general methods to synthesise **pyrazole**, **oxazole** and **thaizole derivaives** ?
28. Explain the mechanism of : (i) Heck ; (ii) **Sonogashira** ; (iii) **Negishi** and (iv) **Stille** couplings.
- (2 x 4 = 8 **weightage**)