(7 pages)

Reg. No. : .....

Code No.: 5803 **Sub. Code: WCHM 21**

M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2024.

Second Semester

Chemistry – Core

ORGANIC REACTION MECHANISM – II

(For those who joined in July 2023 onwards)

Time : Three hours Maximum : 75 marks

PART A — (15 × 1 = 15 marks)

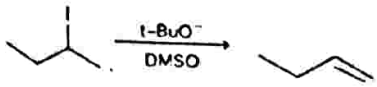
Answer ALL questions.

Choose the correct answer:

1. Which of the following statements regarding E2 reaction is wrong?
   (a) Both hydrogen and leaving group should be antiperiplanar
   (b) It is a concerted reaction in which bonds break and new bonds form at the same time in a single step
   (c) Stereochemistry is retained
   (d) Order of reactivity of alkyl halides in dehydro halogenation is found to be 3°>2°>1°

2. The presence of free radicals can be identified by _____ spectroscopy.
   (a) NMR (b) IR
   (c) UV (d) ESR

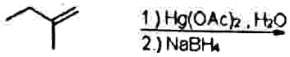
3. Which rule predicts the product in the following reaction?



   (a) Hoffmann (b) Bredt
   (c) Saytzeff (d) Huckel

4. Which of the following is not the true about oxidizing agents?
   (a) accepts electrons (b) gets reduced
   (c) donates electrons (d) produces hydrogen

5. The product of following reaction is

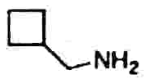


A The products 'A' is...

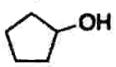
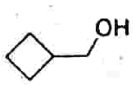
   (a) 
   (b) 
   (c) 
   (d) 

6. Which of the following reagents facilitate allylic oxidation?
   (a) CrO_3 (b) SeO_2
   (c) LTA (d) OsO_4

7. _____ rearrangement involves cyclopropane intermediate.
   (a) Lossen (b) Hoffmann
   (c) Wolff (d) Favorski

8. 

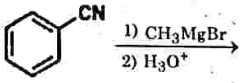
X The product 'X' is

   (a) 
   (b) 
   (c) Both (a) and (b) (d) only (a)

9. The sigmatropic rearrangement among the following is
   (a) Baeyer-Villiger (b) Claisen
   (c) Beckmann (d) Favorskii

10. Cornforth reagent is
    (a) PCC (b) PDC
    (c) PTAB (d) Pyridine

11. Product of the following reaction is _____.



    (a) Benzoic acid (b) benzamide
    (c) Aniline (d) acetophenone

12. Which among the following is the reactant in Stobbe condensation?
    (a) diethyl malonate
    (b) diethyl succinate
    (c) diethyl adipate
    (d) acetylacetone

13. Phenol reacts with diazomethane to give
    (a) o-methyl phenol
    (b) p-methyl phenol
    (c) anisole
    (d) phenyl methanol

14. m-CPBA is used in the conversion of alkenes to
    (a) diols (b) esters
    (c) aldehydes (d) epoxides

[P.T.O.]

15. PCC oxidizes primary alcohols to

(a) aldehydes (b) ketones

(c) acids (d) chloroalkanes

PART B — (5 × 4 = 20 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

16. (a) Describe Hoffmann rule of elimination with examples.

Or

(b) How are free radicals generated? Comment on their stability.

17. (a) Write a short note on Swern oxidation.

Or

(b) Give the steps involved in homogeneous hydrogenation.

18. (a) Describe the mechanism of Stevens rearrangement.

Or

(b) Write a short note on Fries rearrangement.

19. (a) Discuss the speciality of Prins reaction.

Or

(b) Give few applications of Wittig reaction.

20. (a) Discuss the nuances of Baylis-Hillman reaction.

Or

(b) What are Meisenheimer complexes? Give their use.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)
Each answer should not exceed 600 words.

21. (a) Discuss the E1 and E2 mechanism with examples. Explain the effect of substrate and leaving group on elimination reactions.

Or

(b) Explain pyrolytic elimination in Acetates and Xanthates. Discuss the stereochemistry.

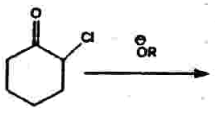
22. (a) How are the following reagents used in reactions- (i) OsO_4 (ii) Ph_3SnH.

Or

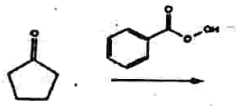
(b) Discuss the mechanism of (i) Corey-Kim (ii) DMSO-DCC oxidations.

23. (a) Give the product and mechanism for the following reactions.

(i)



(ii)



Or

(b) Give the mechanism of

(i) Dienone-Phenol and

(ii) Claisen rearrangements.

24. (a) Analyse the addition of Grignard reagent to ketones, acids, esters and nitrites.

Or

(b) What are Mannich bases? How are they formed? Give a few synthetic uses.

25. (a) Explain the role of following reagents in synthesis (i) DEAD (ii) DMAP

Or

(b) How are following reagents synthetically useful? (i) $TiCl_3$ (ii) PCC

———————