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Reg. No. : .....

Name : .....

Second Semester M.Sc. Degree Examination, July 2019

Chemistry / Polymer Chemistry

CH / CL / CM / CA / PC 222 : ORGANIC CHEMISTRY – II

(Common for Chemistry (2016 Admission Onwards) and Polymer Chemistry (2018 Admission)

Time : 3 Hours Max. Marks : 75

SECTION – A

Answer any **two** among (a), (b) and (c) from each question. Each sub-question carries **2** marks.

1. (a) Ortho-substituted anilines are more acidic than aniline. Why?

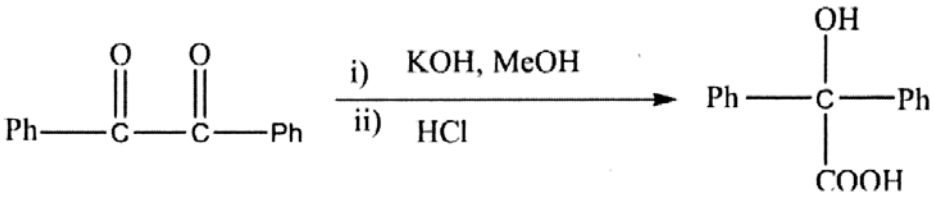
   (b) Explain the limitations of Hammett equation.

   (c) What are phase transfer catalysts?

2. (a) Predict the product in the following reaction and outline the mechanism.

   $R–CH_2–CO–CH_2–Cl \xrightarrow{Base} R\text{-}CH_2\text{-}CH_2\text{-}COO\text{-}$

   (b) Outline the mechanism of the following conversion.

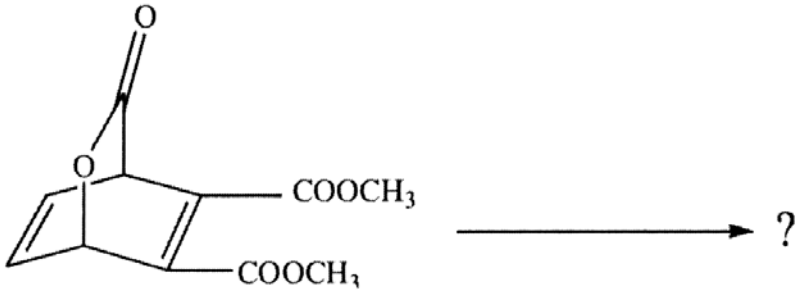


   (c) What is von-Ritcher reaction? Explain the mechanism.

P.T.O.

3. (a) What are chelotropic reactions? Give an example.

(b) Predict the product/s in the following reaction.



(c) Write briefly on mesoionic compounds.

4. (a) What is singlet oxygen? How is it generated?

(b) Outline the mechanism of Barton reaction.

(c) Distinguish between Fries rearrangement and photo-Fries rearrangement.

5. (a) What are secondary metabolites? Give examples.

(b) Outline the Hofmann method of determination of alkaloid carbon skeleton.

(c) Describe the classification of pigments.

(2 × 10 = 20 Marks)

SECTION – B

Answer either (**a**) or (**b**) of each question. Each question carries **5** marks

6. (a) Distinguish between kinetic and thermodynamic control of reactions.

(b) Describe the salt effects and special salt effects in nucleophilic substitution reactions.

7. (a) Outline the mechanism of Bayer-Villiger rearrangement and Orton rearrangement.

(b) Explain the importance of the following rearrangements with their mechanisms.

(i) Smiles

(ii) Wittig.

8. (a) Discuss aromaticity, antiaromaticity and homoaromaticity in organic compounds.

(b) Write briefly on

(i) 1,3-dipolar reactions

(ii) Synthetic applications of Diels-Alder reactions.

9. (a) Describe the following :

(i) Photosynthesis

(ii) Chemiluminescence.

(b) What is sensitization? Explain the mechanism of sensitization and quenching.

10. (a) Delineate the various steps in the biosynthesis of terpenes from mevalonic acid.

(b) Outline the synthesis of testosterone.

(5 × 5 = 25 Marks)

SECTION – C

Answer any **three** questions. Each question carries **10** marks.

11. What is Hammett equation? Explain its significance. How will you estimate Hammett sigma constants?

12. Discuss the mechanisms of the following with evidences in favour.

    (a) Wagner-Meerwein

    (b) Sommelet-Hauser

    (c) Hofmann

    (d) Fischer-Hepp.

13. (a) Describe the selection rules for electrocyclic, cycloaddition and sigmatropic reactions.

    (b) Discuss the CD method of analysis of butadiene to cyclobutene and hexatriene to cyclohexadiene electrocyclic reactions.

14. Explain the different applications of photochemistry.

15. Describe the structure elucidation of nicotine.

(3 × 10 = 30 Marks)

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