K21P 0520

Reg. No. : .....

Name : .....

First Semester M.Sc. Degree (CBSS – Reg./Supple.(Including Mercy Chance)/Imp.) Examination, October 2020
(2014 Admission Onwards)
CHEMISTRY
CHE 1C.03 : Organic Chemistry – I

Time : 3 Hours Max. Marks : 60

SECTION – A

Answer **all** questions in **one** word or **one** sentence. **Each** question carries **one** mark. **(8×1=8)**

1. Is cycloheptatrienyl bromide soluble in water ?
2. Which is more basic – imidazole or pyrrole ?
3. Give the structure of a prochiral molecule.
4. Beckmann rearrangement converts a ketone to a _____
5. Nucleophilic aromatic substitution can occur via _____ mechanism.
6. Quaternary ammonium salts can undergo _____ elimination reaction.
7. Which aldehyde is responsible for the human vision ?
8. Give an example for a *cis-trans* isomerization reaction.

SECTION – B

Answer **any eight** questions. Answer may be **two** or **three** sentences. **Each** question carries **two** marks. **(8×2=16)**

9. What product is formed when biphenyl azide is heated ?
10. Explain homoaromaticity with an example.
11. Why is 2, 6-dimethyl N, N-dimethyl aniline a better base than N, N-dimethyl aniline ?
12. Explain the axial haloketone rule.

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13. Give examples of suitably substituted allenes which are axially chiral and designate them.
14. What is the product formed when 2-methyl cyclohexanone is treated with a peracid ?
15. How is anisole converted to 1, 3-dimethoxy benzene ?
16. How is singlet oxygen generated ? Give an application.
17. What are non-classical carbocations ? Give an example.
18. Predict the product formed when R-2-butanol is treated with thionyl chloride.
19. Depict photo-Fries rearrangement reaction.
20. 2-Bromo fumaric acid undergoes faster elimination than 2-bromo maleic acid. Why ? What is the product formed ?

SECTION – C

Short paragraph questions. Answer **any four** questions. **Each** question carries **three** marks. **(4×3=12)**

21. How is NMR spectroscopy helpful to understand the aromaticity of benzene and [18] annulene ?
22. Why are dialkoxy carbenes nucleophilic ?
23. Depict the structures of *cis* and *trans* decalins.
24. Depict the mechanism of conversion of dienones to phenols.
25. Illustrate the Favorskii reaction.
26. Illustrate the E1CB mechanism with a suitable example.
27. How are oxetanes photochemically synthesized ?
28. What product is formed when 3, 3-dimethyl 1, 4-pentadiene is heated ?

SECTION – D

Essay type questions. Answer **four** questions. **Each** question carries **six** marks. **(4×6=24)**

29. A) Classify the following as aromatic, anti-aromatic or non-aromatic : cyclopropenyl cation, cyclopentadienyl anion, cyclotropylium anion, [16] annulene, cyclooctatetraene and cyclohexadiene.

OR

B) Hyperconjugation can explain the stability of alkenes and carbocations but not carbanions. Justify the statement with suitable illustrations.

30. A) i) Provide examples for molecules having (a) chiral plane (b) non-carbon chiral centre (c) helical structure

ii) Depict the most stable conformer of (a) ethylene glycol (b) trans-1, 3-dichloro cyclohexane and (c) trans-4-^{t}Bu-1-hydroxy cyclohexane.

OR

B) Illustrate the dehydrohalogenation of meso-1, 2-dibromo-1, 2-diphenyl ethane.

31. A) Illustrate the major product formed when the following molecules are treated with a base : i) cis-1-hydroxy-2-tosyloxy cyclohexane and ii) trans-1-hydroxy-2-tosyloxy cyclohexane.

OR

B) Illustrate the mechanism of Von Richter reaction.

32. A) Depict the mechanism of i) Norrish Type I and II reactions and ii) Barton reaction.

OR

B) Explain photosensitization and quenching providing examples.
