Reg. No…….. Name…… **20U520**

B. Sc. DEGREE END SEMESTER EXAMINATION OCT. 2020: JANUARY 2021

SEMESTER **–5: CHEMISTRY (CORE COURSE)**

COURSE: **15U5CRCHE06: ORGANIC CHEMISTRY - III**

(Common for Regular 2018 admission & Improvement 2017/Supplementary 2017, 2016 /2015 admission)

Time: Three Hours Max. Marks: 60

SECTION A

Answer all questions. Each question carries 1 mark

1. Draw the tautomeric forms of nitromethane.
2. Give the preparation of alizarin dye.
3. What is Borsche's reagent chemically? Give the structure.
4. What are sulpha drugs?
5. Give 2 uses of urea-formaldehyde resin.
6. List the characteristic IR peaks in acetamide.
7. What are auxochromes? Give an example.
8. Give 2 uses of phenylhydrazine. (1 × 8 = 8)

SECTION B

Answer any Six questions. Each question carries 2 marks

9. Can Gabriel-Phthalimide synthesis be used for synthesizing aniline? Explain.
10. Which is more basic - methyl amine or aniline? Why?
11. What is chemical shift in NMR?
12. Give the differences between thermal and photochemical reactions.
13. What is SBR? How it is prepared?
14. Draw the structure of chloroquine and give its uses.
15. Explain the preparation and uses of phenolphthalein.
16. Write the synthesis and applications of periodic acid. (2 × 6 = 12)

SECTION C

Answer any Four questions. Each question carries 5 marks

17. Write a short note on azo dyes.
18. Give the mechanism of a) Curtius rearrangement and b) Arndt-Eistert synthesis.
19. a) What is the effect of (i) hydrogen bonding and (ii) conjugation on the carbonyl frequency in IR spectrum?

b) Two isomeric compounds **A** and **B** have molecular formula $C_2H_4Cl_2$. Compound **A** gives one NMR signal as a singlet at δ = 3.7 whereas **B** gives two signals, a doublet at δ = 2.1 and a quartet at δ = 5.8. Assign the structure to compound **A** and **B** with relevant explanation.

20. Explain preparation, properties and uses of polyurethanes.
21. What is Hinsberg's reagent? How is it used for the separation of 1°, 2° and 3° amines?
22. Discuss the mechanism of a) Paterno-Buchi reaction b) Norrish type-1 reaction

(5 × 4 = 20)

SECTION D

Answer any 2 questions. Each question carries 10 marks

23. a) Discuss the various products formed during the reduction of aromatic nitro compounds under different conditions.
    b) Explain the use of quaternary ammonium salts as phase transfer catalysts.
24. a) Write a note on synthetic detergents and comment on the environmental impact of using detergents.
    b) How is indigo prepared from anthranilic acid?
25. a) Explain spin−spin coupling and spin–spin splitting in NMR spectroscopy.
    b) Give a detailed account of the IR and NMR spectral characteristics of the following: butadiene, acetaldehyde, crotonaldehyde and ethanol.
26. a) What is Bayer's strain theory? Explain why cyclopropane and cyclobutane are unstable compared to cyclohexane.
    b) Write a note on the synthesis and applications of N-bromo succinimide and lead tetra acetate.

(10 × 2 = 20)

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