D 11176 (Pages : 3) Name.....

Reg. No.....

FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2016

(CUCBCSS–UG)

Chemistry/Polymer Chemistry/Industrial Chemistry

CHE 5B 07—ORGANIC CHEMISTRY—II

Time : Three Hours

Maximum : 80 Marks

Section A

Answer **all** *questions.*
Each question carries 1 *mark.*

1. Frankland reagent is ———.
2. The structural formula of Sulphadiazine is ———.
3. Benzene diazonium chloride on heating with hypophorous acid gives ———.
4. The major product obtained by reacting Nitrous acid with dimethyl amine is ———.
5. Williamson's method is used to prepare ———.
6. The structure of Indole is represented as ———.
7. Phenol on Kolbe's reaction gives ———.
8. m-Dinitrobenzene on reduction with ammonium sulphide gives ———.
9. A mixture of anhydrous $ZnCl_2$ and HCl is known as ———.
10. 2-Methyl 2-butanol on treating with concentrated H_2SO_4, the major product obtained will be ———.

(10 × 1 = 10 marks)

Section B

Answer any **ten** *questions.*
Each question carries 2 *marks.*

11. Outline the method to prepare saccharin from toluene.
12. What is Knoevenagel reaction ?
13. Explain Blane's rule.
14. What reagents and reaction conditions would you use to prepare t-Butyl alcohol from Isobutyl alcohol ?
15. Write the mechanism of Riemer-Tiemann reaction.
16. Explain the mechanism of E2 reaction.

Turn over

17. What are the products obtained when methyl amine is treated with methyl iodide ?

18. Explain Gabriel phthalimide synthesis.

19. Give the synthesis of Alizarin.

20. Give a method of preparation of Sulphanilamide.

21. What is Wolfkishner reduction ?

22. What is diazotisation ? Give an example of coupling reaction.

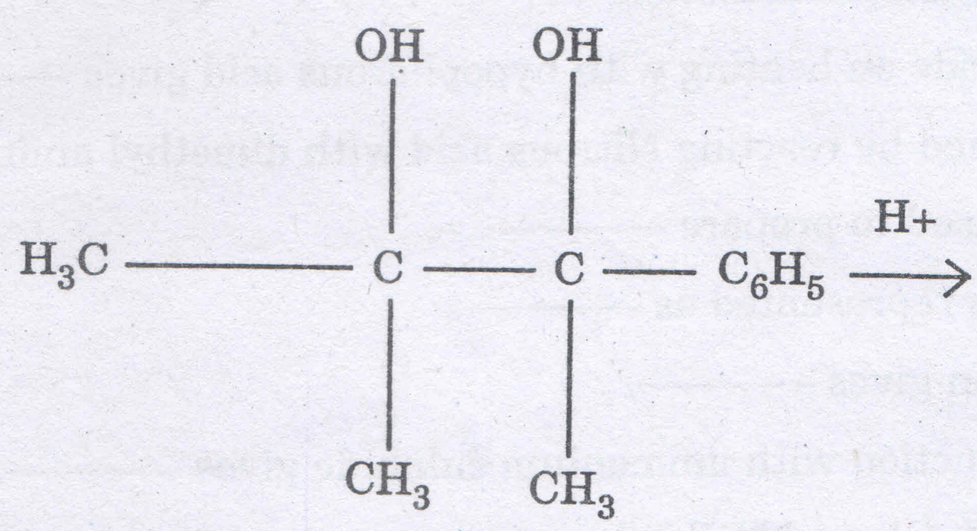
(10 × 2 = 20 marks)

Section C

Answer any **five** *questions.*
Each question carries 6 *marks.*

23. (a) What is Victor Mayer test ?

(b) Predict the major product and discuss the mechanism of the following reaction :



24. (a) What is Hoffman's bromamide reaction ?

(b) Describe the Hinesburg method of separation of primary, secondary and tertiary amines from their mixture.

25. How is ethyl acetoacetate prepared ? Give three imporant synthetic applications.

26. (a) Give two reactions of alkyl lithium to show its synthetic applications.

(b) How are the following compounds prepared ?

(i) 2-Methyl 2-butanol from 2-propanol; (ii) Acetaldehyde to Crotonic acid.

27. How are the following compounds prepared :

(a) 2, 4, 6-tribromobenzene from aniline ; (b) Citric acid ; (c) Methyl orange.

28. (a) Write a method each for the preparation of the following compounds :

(i) Pyridine ; (ii) Indole.

(b) Arrange the following aliphatic amines in the decreasing order of their basicity- Trimethylamine, Diemthylamine, methyl amine and ethyl amine. Justify your answer.

29. (a) Discuss the various products obtained by the reduction of nitrobenzene in acidic, basic and neutral media.

(b) What is Perkins reaction ?

30. (a) Discuss addition elimination mechanism of aromatic nucleophilic substitution reactions. Give the evidence in support of this mechanism.

(b) Would you expect 1-bromo 2-methylbutane to be more/less active than 1-bromo 3-methylbutane is SN2 reaction ? Explain.

(5 × 6 = 30 marks)

Section D

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

31. (a) What is Benzyne mechanism for nucleophilic substitution reactions ? Give evidence in support of your answer.

(b) Acid catalysed ring opening of isopropylene oxide gives 2-Methoxy-2-methyl-1-propanol while base catalysed ring opening of the compound gives 1-Methoxy-2-methyl-2-propanol. Explain.

(c) Describe Ziesel's method of estimation of alkoxy group.

(4 + 4 + 2 = 10 marks)

32. (a) Write the mechanism of SN2 reaction. Discuss how is the structure of substrate molecule and nucleophilicity of the attacking reagent affect the reactivity of an SN_2 reaction.

(b) Explain Vinyl halides are much less reactive while allyl halides are unusually reactive in nucleophilic substitution.

(c) Define Saytzeff's rule with one example.

(5 + 3 + 2 = 10 marks)

33. Illustrate the mechanism of the following reactions :

(i) Cannizaro reaction.
(ii) Beckmann rearrangement.
(iii) Aldol condensation.
(iv) Riemer Tiemann reaction.
(v) Claisen rearrangement.

34. Explain why :

(i) Carboxylic acids are stronger acids than alcohol.
(ii) Lactic acid gives iodoform test.
(iii) Metanitrobenzoic acid is a weaker acid than paranitrobenzoic acid.
(iv) 2, 6-Dimethyl benzoic acid, when heated with ethyl alcohol and a trace of acid fails to form the ester.
(v) Amides are much weaker bases than amines.

(5 × 2 = 10 marks)

[2 × 10 = 20 marks]