(6 pages) **Reg. No. :**

Code No. : 5880 Sub. Code : PCHM 31

M.Sc. (CBCS) DEGREE EXAMINATION, NOVEMBER 2020.

Third Semester

Chemistry-Core

ORGANIC CHEMISTRY — III

(For those who joined in July 2017 onwards)

Time : Three hours Maximum : 75 marks

PART A — $(10 \times 1 = 10 \text{ marks})$

Answer ALL questions.

Choose the correct answer.

- 1. When 2-bromobutane undergoes elimination reaction (alk.KOH), 80% — and 20% 1-butene are produced.
 - (a) 2-butene (b) ethane
 - (c) propene (d) ethane
- 2. When a quaternary ammonium salt in heated, ______ and a tertiary ammine are produced.
 - (a) acid (b) olefin
 - (c) aldehyde (d) ethane

- 3. NMR spectra are observed in ——— region.
 - (a) microwave (b) radio frequency
 - (c) uv/vis (d) x-ray
- 4. Write the multiplicity of signals in $CH_3CH_2OH_{(aqueous)}$ in NMR spectroscopy.
 - (a) singlet, triplet and quartet
 - (b) 2 triplet and quartet
 - (c) three singlet
 - (d) three doublet
- 5. In case of polynuclear hydrocarbons, the base peak appears
 - (a) as parent ion peak
 - (b) at 91 due to tropylium ion
 - (c) at 77 due to phenylcation
 - (d) at 65 due to C_5H_5 +
- 6. The following peaks are obtained in the mass spectrum of an organic compound: m/e value at 88% 73 60 (MR ions), 45. The organic compound should be
 - (a) $CH_3CH_2COOCH_3$
 - (b) $CH_3COOCH_2CH_3$
 - (c) $CH_3CH_2CH_2COOH$
 - (d) CH₃CH=CH-COOH

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- 7. The reaction in which a carbonyl compound reacts with olefins to give oxa-cyclobutane in known as
 - (a) Patero-Buchi reaction
 - (b) Perkin reaction
 - (c) Bucherer reaction
 - (d) Claisen reaction
- 8. In the Barton reaction, a methyl group in the ——— position to OH group in converted into an oxime group.
 - (a) α (b) β
 - (c) γ (d) δ
- 9. The color of anthoxanthines is
 - (a) yellow (b) blue
 - (c) violet (d) red
- 10. Flavanone reacts with bromine followed by OH⁻ to give ————.
 - (a) Flavone
 - (b) Iso flavonol
 - (c) Flavonol
 - (d) Flavonal

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PART B — $(5 \times 5 = 25 \text{ marks})$

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Explain the effect of leaving group on the rate of aliphatic nucleophlic substitution reaction.

Or

- (b) Explain the E_2 mechanism with example.
- 12. (a) Compare H^1 and C^{13} NMR spectroscopy.

Or

- (b) Briefly explain INADEQUATE spectra with suitable example.
- 13. (a) Write the fragmentation pattern of alcohols and amines.

Or

- (b) State and explain nitrogen rule.
- 14. (a) What is Sigmatropic rearrangement? Explain with example.

Or

(b) State and explain Woodward–Hoffmann rules.

Page 4 Code No. : 5880 [P.T.O.] 15. (a) How is indole synthesized? Write any three reactions of indole.

 \mathbf{Or}

(b) How is flavone synthesized?

PART C — $(5 \times 8 = 40 \text{ marks})$

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Discuss the competition between substitution and elimination reactions.

 \mathbf{Or}

- (b) Compare Hoffmann and Saytzeff rules of elimination.
- 17. (a) What is NOE? Explain NOE in stereochemistry. Or
 - (b) Discuss the significance of FT-NMR.
- 18. (a) A compound with molecular mass 71 is transparent in the ultraviolet spectrum. In infrared, medium bands are formed at $2941-2857 \text{ cm}^{-1}$, 2247 cm^{-1} and at 1460 cm^{-1} Two singlets are formed at (i) 5.78 τ (16.8 squares) and (ii) 6.51 τ (23.9 squares). Identify the compound.

Or

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- (b) A pale yellow compound is slightly acidic in nature and gave the following data :
 - (i) UV : 280 $m\mu \varepsilon_{\text{max}}$ 6600
 - (ii) IR: 3460 (v, sh) 3035 (m), 1608 (m), 1585 (m), 1510 (s), 1360(s), 1320 (s) 740 cm⁻¹ (v, s). The band at 3460 cm⁻¹ does not shift even on diluting the sample.
 - (iii) NMR: -2.1τ (singlet) 1 H and unsymmetrical pattern 2.61 -2.75τ (4 H). Identify the compound.
- 19. (a) Explain Norrish type I and Norrish type II cleavages.

 \mathbf{Or}

- (b) Explain the mechanism of Batterno-Buchi Reaction.
- 20. (a) Discuss structure of Maltose.

Or

(b) Discuss the structure of Starch.

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