

B.Sc. 4th Semester (New Scheme)

Examination, May-2017

BIOTECHNOLOGY

Paper-BT-406

Organic Chemistry

Time allowed : 3 hours]

[Maximum marks : 40

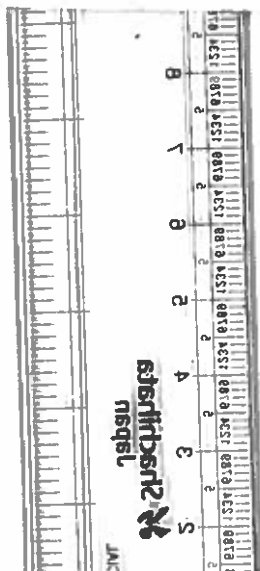
Note : Attempt five questions in all, selecting one question from each section. Question No. 1 is compulsory.

1. (a) Define overtones
- (b) Calculate the number of fundamental absorption bands possible for benzene molecule.
- (c) What is exhaustive methylation ?
- (d) What do you mean by ortho effect ?
- (e) Define Gattermann reaction
- (f) How can you carry out selective reduction of m-dinitrobenzene ?
- (g) What is Sarett's reagent ?
- (h) Out of acetaldehyde and acetone, which is more reactive towards nucleophilic addition reactions ?

1×8=8

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[P.T.O.]



**Section-A**

2. (a) Differentiate : 4  
(i) Symmetric and asymmetric stretching  
(ii) Inplane and out of plane bending
- (b) Describe : 4  
(i) Hooke's law  
(ii) Vibrational coupling
3. (a) Differentiate the following pair of compounds using IR spectroscopy : 3  
(i)  $C_6H_5CHO$  and  $CH_3OCH_3$   
(ii)  $CH_3CH_2OH$  and  $CH_3COOH$
- (b) Explain the effect of hybridisation on the stretching frequency of C-H bonds. 3
- (c) Some of the fundamental vibrations are infrared active while others are not. Explain. 2

**Section-B**

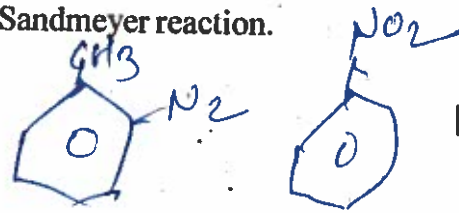
4. (a) Describe the preparation of amines by : 4  
(i) Hofmann bromamide reaction  
(ii) Reductive amination reaction

- (b) Arrange the following amines in increasing order of basic strength : 2  
Aniline, benzylamine, p-nitroaniline, methylamine
- (c) Explain, azo dye test for primary aromatic amines. 2
5. (a) Describe the basicity of o-, m- and p-toluidine relative to aniline. 3
- (b) How can you separate primary, secondary and tertiary amines using Hinsberg's method. 3
- (c) Illustrate Gabriel phthalimide reaction with mechanism. 2

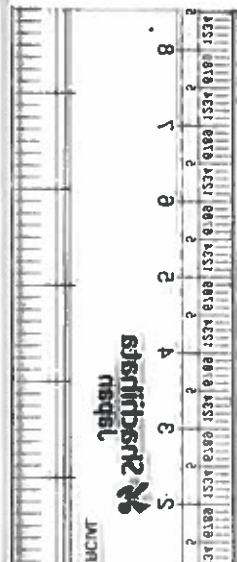
## Section-C

6. (a) Using benzenediazonium chloride, how can you prepare the following compounds : 3
- (i) Nitrobenzene
- (ii) Fluoro benzene
- (b) Describe the mechanism of coupling reaction of benzene diazonium chloride. 3
- (c) Explain Sandmeyer reaction. 2

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7. (a) Write two method of preparation of nitroalkanes. 3  
(b) Compare the reduction of nitrobenzene under acidic, basic and neutral conditions. 3  
(c) Describe the mechanism of nitration of benzene. 2

**Section-D**

8. (a) Why benzaldehyde does not undergoes aldol condensation? 2  
(b) Explain with mechanism : 6  
(i) Baeyer-villiger oxidation  
(ii) Benzoin condensation  
(iii) Wolff Kishner reduction.
9. (a) Explain the oxidation of alcohols using Careys reagent. 2  
(b) Describe the mechanism of Mannich reaction. 2  
(c) Convert : 4  
(i) Benzaldehyde to Cinnamic acid  
(ii) Benzaldehyde to Benzyl alcohol.

