

**School of Basic Sciences**  
**Bachelor of Science Honours in Chemistry**  
**Semester End Examination - May 2024**

Duration : 180 Minutes  
 Max Marks : 100

**Sem VI - C1UB602B - Organic Synthesis**

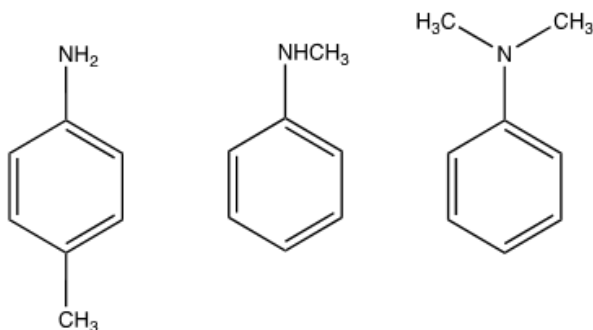
General Instructions

*Answer to the specific question asked*

*Draw neat, labelled diagrams wherever necessary*

*Approved data hand books are allowed subject to verification by the Invigilator*

- 1) Define the role of ruthenium tetroxide in organic synthesis K1 (3)
- 2) Explain the products formed by reaction of the following amines with nitrous acid? K2 (4)

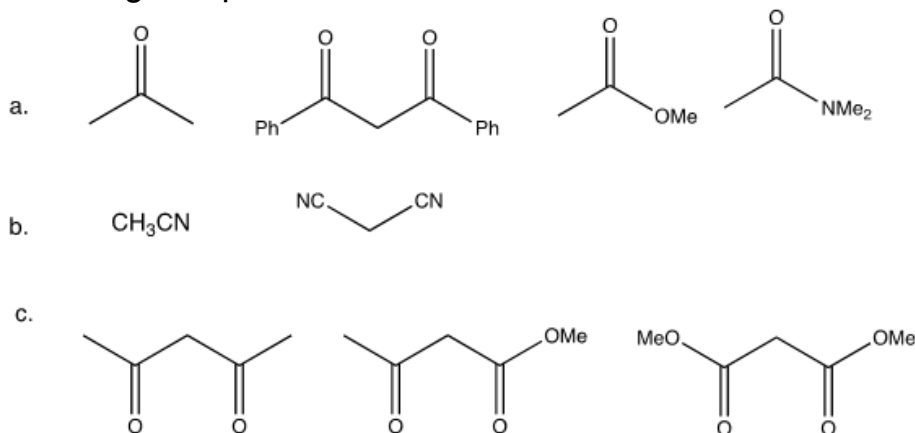


- 3) Explain the reaction pathway and major product in following reactions: K2 (6)
  - a) reaction of grignard reagent and gilman reagent with  $\alpha$ ,  $\beta$ -unsaturated carbonyl compounds;
  - b) allylic oxidation of alkene using  $SeO_2$
- 4) Illustrate electrophilic aromatic substitution mechanism for the synthesis of following products; ortho and para nitroaniline, tribromoaniline. K3 (6)
- 5) Illustrate the reduction of nitroarenes in acidic, neutral and alkaline medium K3 (6)
- 6) Illustrate the synthesis of ketone from 1,3-dithiane and nitriles with proper mechanism. K3 (9)
- 7) Illustrate Gabriel- phthalimide reaction with proper example K3 (9)

- 8) Analyze the basicity of primary, secondary and tertiary amines in aqueous medium. K4 (8)
- 9) Analyze the electrophilic substitution reaction of quinoline K4 (12)
- 10) Examine the Hinsberg test for separation of primary, secondary and tertiary amines. K5 (10)
- 11) Examine the products and mechanism in the following cases; a) reaction of amide, bromine and sodium hydroxide; b) reaction of aryl diazonium salt with copper chloride; c) reaction between secondary amine and ketone; d) reaction of aniline with nitrous acid K5 (15)

**OR**

Examine increasing order of the acidity of the  $\alpha$ -hydrogen of the following compounds; K5 (15)



- 12) Discuss the following; a) acidic strength of salicylic acid and benzoic acid; b) reactivity of aldehyde and ketone towards nucleophilic addition. K6 (12)

**OR**

Elaborate the acidic strength with proper explanation in following cases; a) ortho, meta and para- nitro benzoic acid; b) ortho, meta and para- hydroxy benzoic acid; c) phenol and carboxylic acid K6 (12)