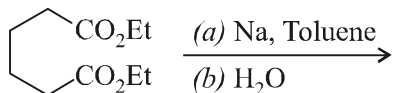


(6)

- (e) Predict the major product for the following reaction with a mechanistic explanation for each step.



★ ★ ★

Ex/SC/CHEM/UG/CORE/TH/06/2025 (OLD)

B. SC. CHEMISTRY EXAMINATION, 2025

(3rd Semester, OLD)

CHEMISTRY (CORE)

PAPER : CORE/CHEM/TH/06

Time : Two Hours

Full Marks : 40

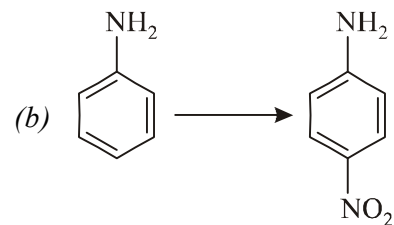
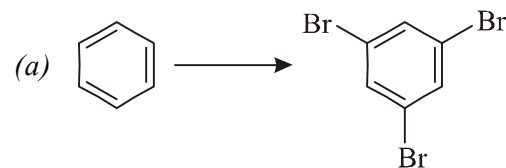
(20 marks for each Unit)

Use a separate Answer Script for each Unit.

UNIT—3061-O

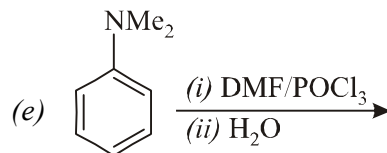
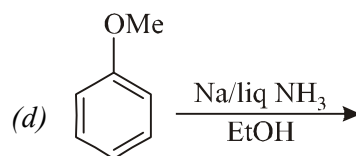
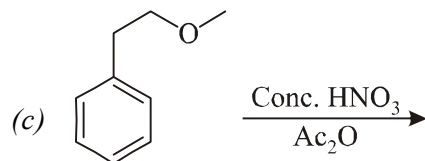
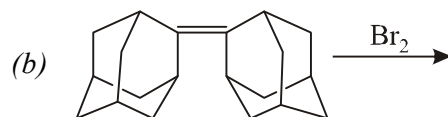
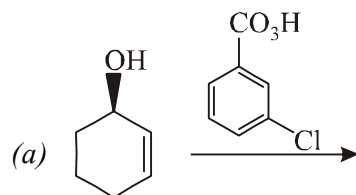
1. Carry out the following transformations :

2×2



(2)

2. Predict the major product formed in the following reaction with plausible mechanism (*any four*) : 1½×4



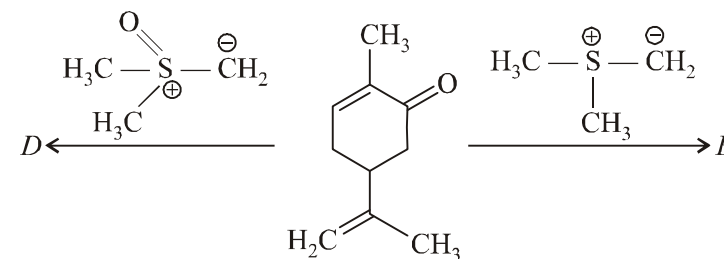
CHEM-1067

[Continued]

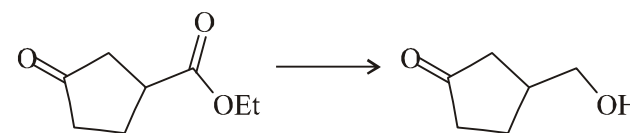
(5)

6. Answer **all** questions : 2×5

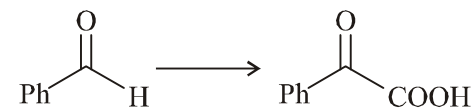
- (a) Arrange the following carbonyls according to their relative rate of hydration : Acetone, formaldehyde and trichloroacetaldehyde. Explain your answer.
- (b) Write the structure of expected major products *D* and *E* in the following reaction :



- (c) Carry out the following conversion with suitable reagents/conditions. It may require multiple steps :



- (d) Carry out the following conversion through a thioacetal intermediate.



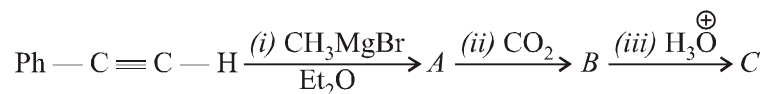
CHEM-1067

[Turn Over]

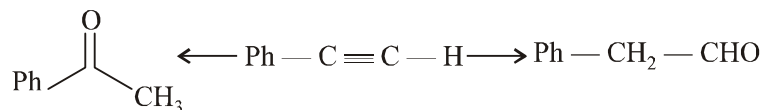
(3)

3. (a) Give an example of Reformatsky reaction and propose the mechanism. 2½

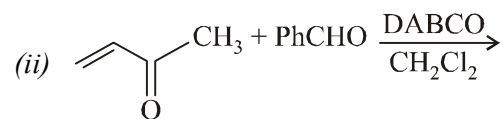
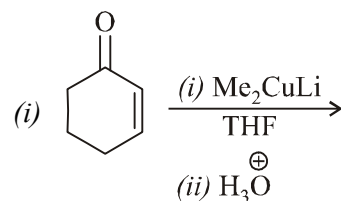
(b) Draw the structure of the products in the following reaction sequence. 1½



(c) Mention the reagents in the following transformations (Mechanism not required): 2



(d) Predict the product in the following reactions and explain with mechanism. 2+2



CHEM-1067

[Turn Over]

(4)

UNIT—3062-O

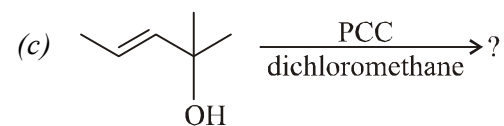
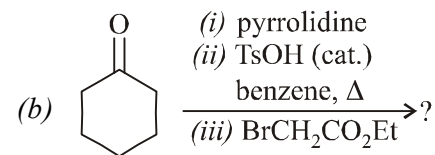
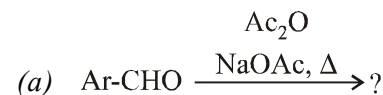
4. Answer *any two* of the following : 2½×2

(a) Explain the role of Dess-Martin Periodinane (DMP) in the oxidation of a secondary alcohol to ketone.

(b) 2-Chlorocyclohexanone produces cyclopentane carboxylic acid in presence of sodium hydroxide *via* ring contraction reaction. Prove that the reaction proceeds *via* a cyclopropanone intermediate.

(c) How will you prepare silyl enol ether from acetophenone (PhCOCH₃)? Show the use of silyl enol ether in the alkylation of acetophenone using 3°-alkyl halide.

5. Write down the product(s) of the following reactions with probable mechanism (*any two*): 2½×2



CHEM-1067

[Continued]