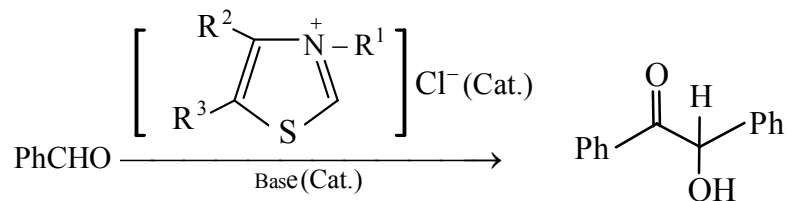


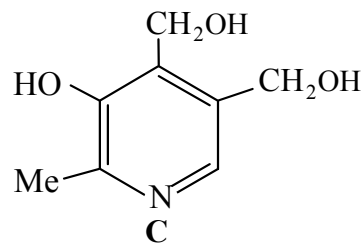
c) Suggest a plausible mechanism for the following reaction.

3



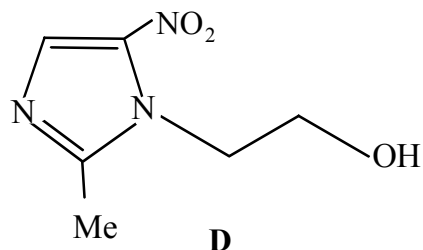
d) Discuss how you can synthesize the given compound **C** starting from an appropriate amino acid derivative with temporary construction of an azole moiety as the intermediate (only suggest the steps with reagents, no mechanism is needed).

2



e) Suggest a scheme for the synthesis of the following compound **D** (only mention the steps with reagent, no mechanism is necessary).

2



## M.Sc. CHEMISTRY EXAMINATION, 2019

( 2nd Semester )

ORGANIC CHEMISTRY

PAPER - VI

Time : Two hours

Full Marks : 50

( 25 marks for each unit )

Use a separate answerscript for each unit.

### UNIT - 2061

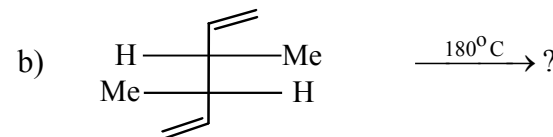
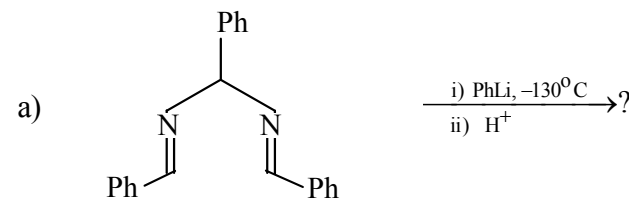
1.  $[\pi^4s + \pi^2s]$  Cycloaddition reaction is allowed under thermal condition – explain with the help of correlation diagram.

4

2. Write down the product(s) with proper justification .

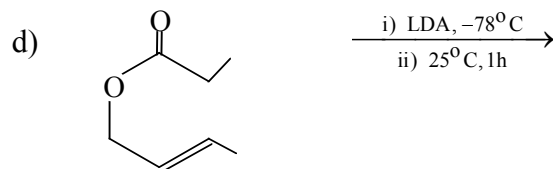
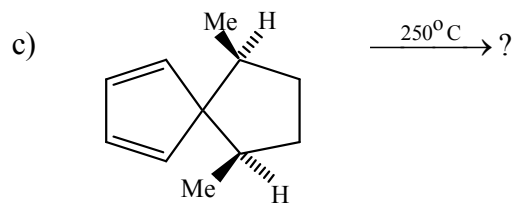
(Attempt *any three*)

$1\frac{1}{2} \times 3$



[ Turn over

[ 2 ]



3. Answer **any two** of the following questions : 2×2

a) The value of reaction constant ( $\rho$ ) for substituted benzoic acid dissociation changes with change of the solvent system as below :

Solvent	$\rho$ -value
H <sub>2</sub> O, 25°C	1.00
50% aq. EtOH, 25°C	1.60
EtOH, 25°C	1.96

Give reason for this type of variation of the  $\rho$ -values.

b) The substituent constants ( $\sigma_p$ ) for the substituents COCH<sub>3</sub>, COCH<sub>2</sub>CH<sub>3</sub>, COCH(CH<sub>3</sub>)<sub>2</sub> and COC(CH<sub>3</sub>)<sub>3</sub> at the *para*-position of the aromatic ring are 0.5, 0.48, 0.47, and 0.32, respectively. How will you justify the sharp decrease of the  $\sigma_p$  value in the case of COC(CH<sub>3</sub>)<sub>3</sub> ?

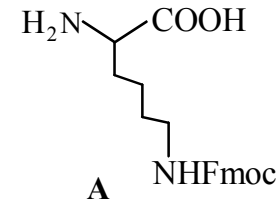
[ 7 ]

c) Give experimental evidence with proper justification in favour of the fact that the piperidine ring in  $\psi$ -tropine can exist in boat conformation. 1  $\frac{1}{2}$

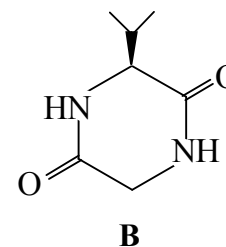
d) Justify whether the following statement is correct or not.

“3, 5-Dinitrobenzoyl chloride reacts with (+) - neomenthol at a higher rate compared to (+) - neoisomenthol.” 2

7. a) How can you obtain the following compound **A** from an appropriate amino acid without using any reagent containing transition metal ? 2

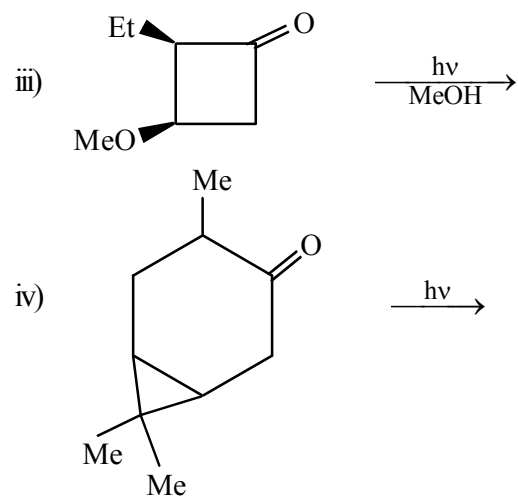


b) Design a scheme for the synthesis of the given compound **B** starting from appropriately protected amino acids (only mention the steps with reagent, no mechanism is needed). 4

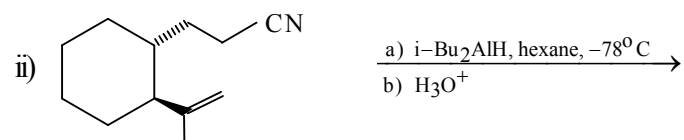
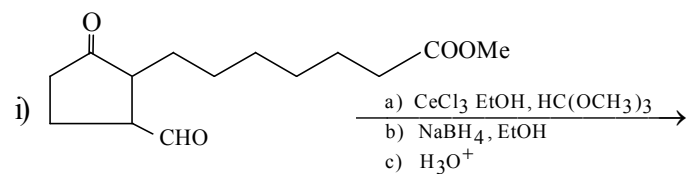


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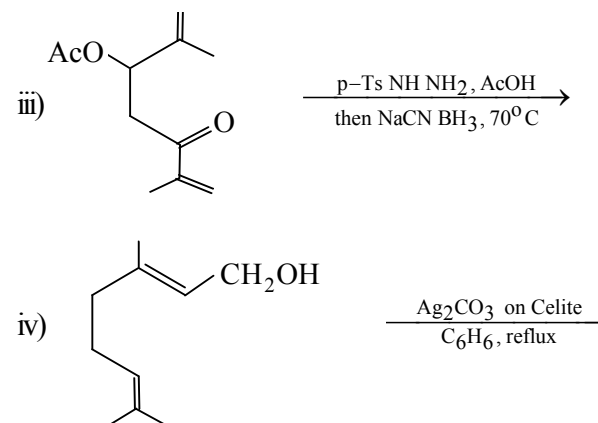
[ 4 ]



5. a) Predict the product(s) of the following reactions and explain their formations with plausible mechanism. **(any two)** 2×2



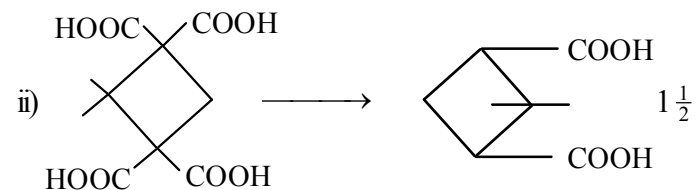
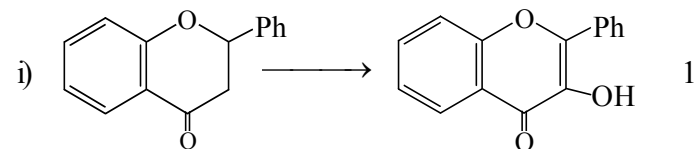
[ 5 ]



- b) Schematically show how you can prepare Dess-Martin periodinane (DMP) reagent from *o*-iodobenzoic acid. 1

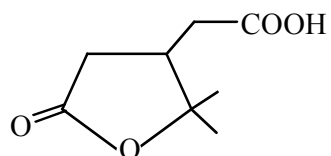
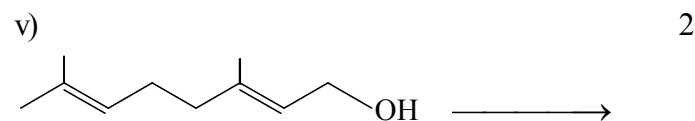
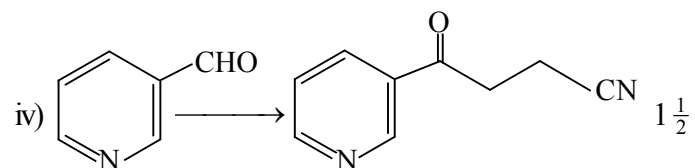
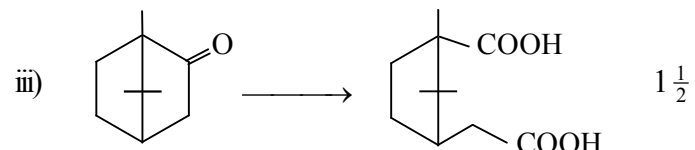
### UNIT - 2062

6. a) Carry out the following transformations clearly indicating the steps involved (mechanism is not required)

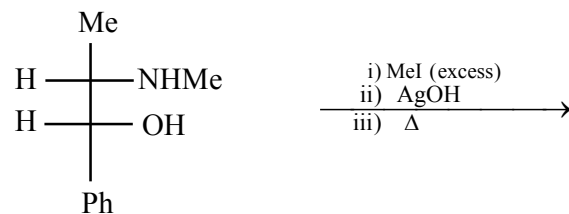


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[ 6 ]



b) Predict the product of the following reaction (no mechanism is needed).  $1$

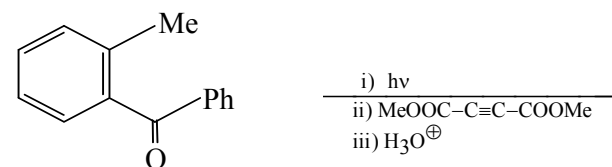


[ 3 ]

c) Establish the following relation with proper logic.

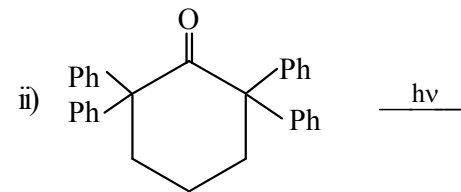
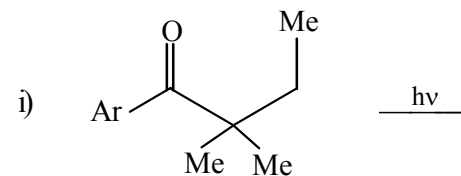
$$\sigma_R = \sigma_p - \sigma_m$$

4. a) What happens when benzophenone is irradiated in 2-propanol? Comment on the quantum yield of this photolytic conversion. Write down the product of the following reaction mentioning the structure of the intermediates.  $1 + \frac{1}{2} + 1\frac{1}{2}$



- b) Predict the product(s) and formulate reasonable mechanisms for the following reactions (*any three*)

$1\frac{1}{2} \times 3$



[ Turn over