

**FINAL B. SC. EXAMINATION, 2017**

( 1st Semester )

**CHEMISTRY (HONOURS)****PAPER - XVI****ORGANIC CHEMISTRY**

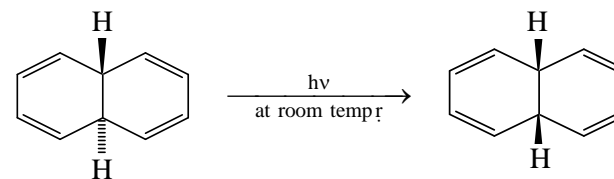
Time : Two hours

Full Marks : 50

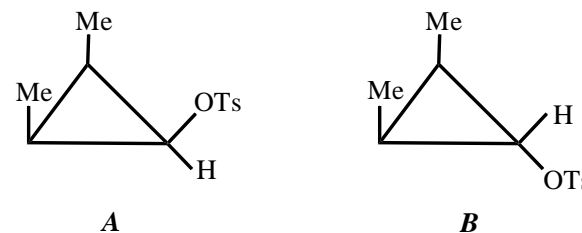
Use a separate answerscript for each group.

**GROUP - A**

1. a) Explain the following observation :
- 1  $\frac{1}{2}$



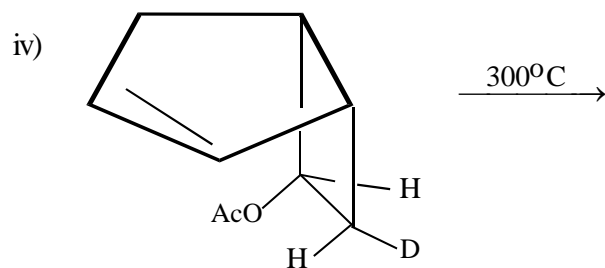
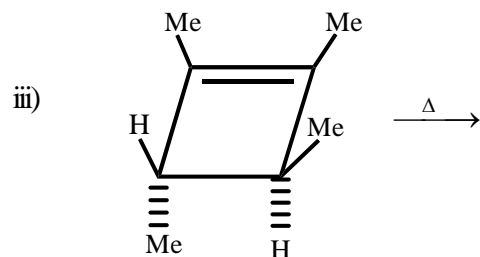
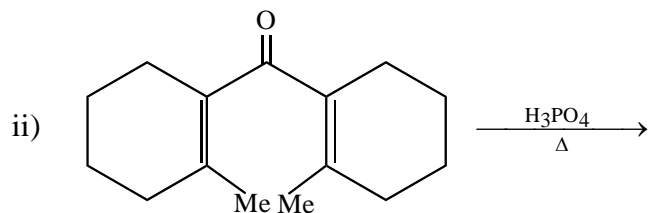
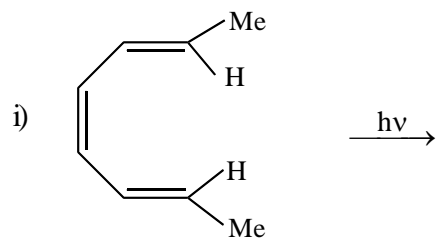
- b) Which of the following compounds
- A**
- and
- B**
- would undergo faster acetolysis in acetic acid at 150°C and why?
- 2



[ Turn over

[ 2 ]

- c) Predict the product(s) with stereochemistry and explain on the basis of FMO theory (attempt any **three**)  $1\frac{1}{2} \times 3$



[ 9 ]

- c) Carry out the following conversions (attempt **any two**):

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

- Acetylene to neoprene rubber.
- D-Glucose to glucuronic acid.
- D-Glucose to D-fructose.

7. a) Write down the reaction products when sucrose undergoes periodic acid oxidation. 2

- b) Synthesize polypropylene following the radical polymerization. Comment on the stereo chemistry of CH<sub>3</sub> groups and the properties of the resulting polymer.

 $1\frac{1}{2} + 1$ 

- c) Mention the name of the monomeric units involved in the polymers (i) melamine and (ii) glyptal. 1

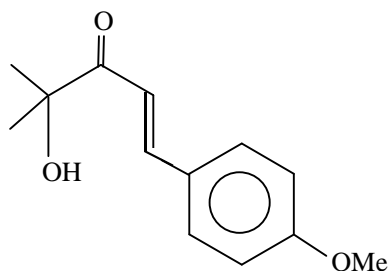
- d) What is nucleotide? Write the structure of the following trinucleotide:  $1\frac{1}{2}$



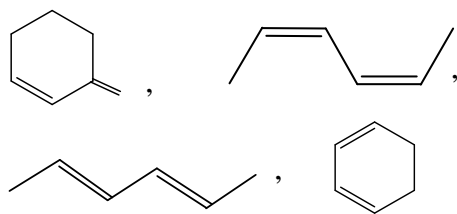
- e) What are the major differences between β-DNA and Z-DNA. 2

[ 4 ]

- b) Comment on the cyclisation of the following compound under acidic or basic condition. Explain your answer. 2



- c) Arrange the following dienes in order of increasing reactivity in Diels-Alder cycloaddition reaction with tetracyanoethylene. Give suitable explanation in favour of your choice. 1



[ 7 ]

5. How do you carry out the following chemical conversions ?

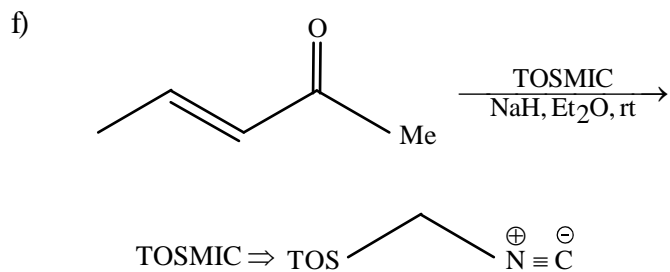
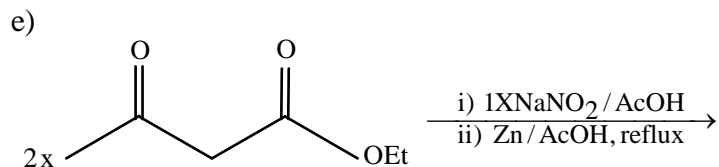
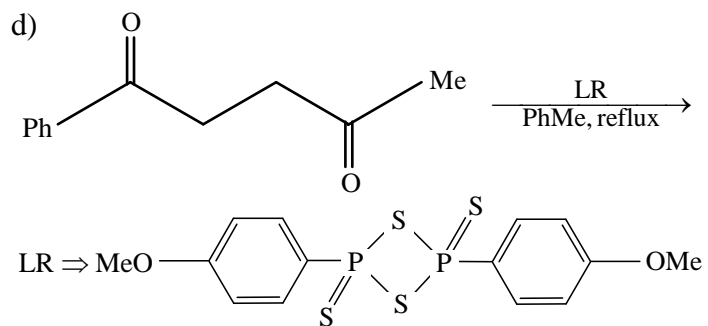
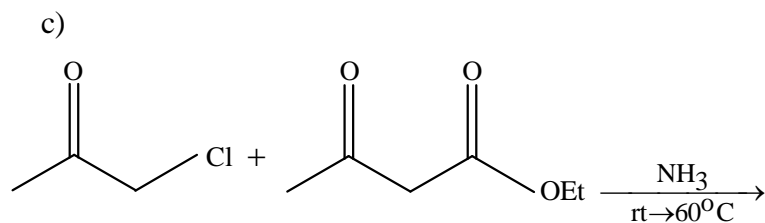
(answer *any four*)

1 ½ × 4

- a)
- b)
- c)
- d)

[ Turn over

[ 6 ]



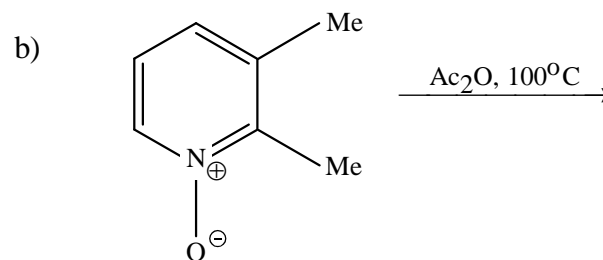
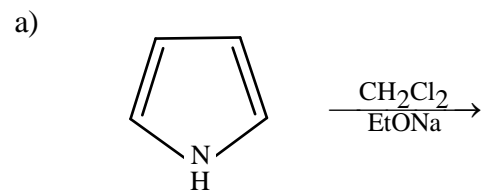
[ 5 ]

**GROUP - B**

3. Answer **any two** of the following questions.  $1\frac{1}{2} \times 2$

- Pyrrole is more reactive than pyridine towards electrophilic substitution – Explain.
- Explain the aromatic character of pyrrole on the basis of resonance and molecular orbital structures.
- Quinoline undergoes electrophilic attack in the benzene ring while nucleophilic attack takes place in the pyridine ring – Explain.

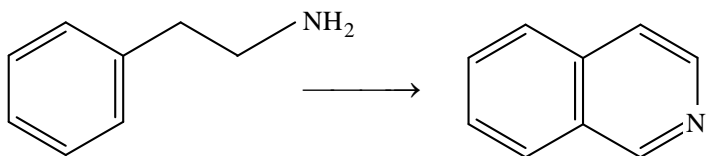
4. Predict the product with plausible mechanism. (Answer **any four**)  $2 \times 4$



[ Turn over

[ 8 ]

e)

**GROUP - C**

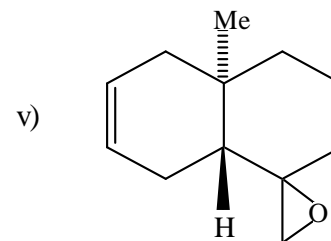
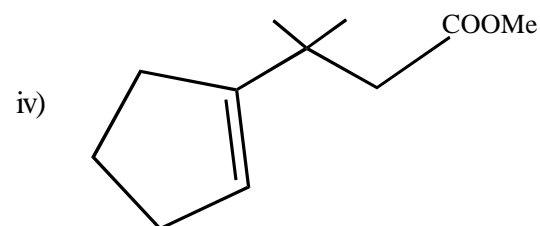
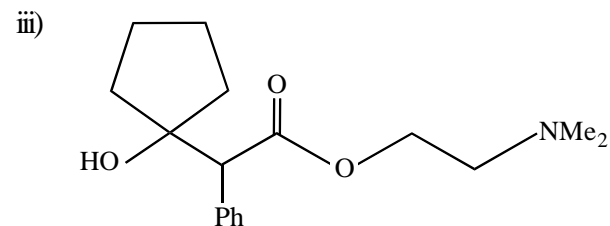
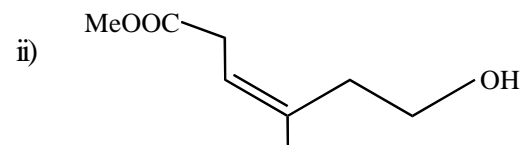
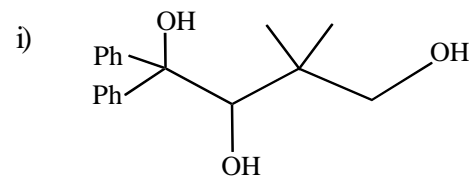
6. a) Draw the Haworth Structure for methyl  $\beta$ -D-fructofuranoside. 1

b) Explain the following observations. (attempt *any two*)  
1  $\frac{1}{2}$   $\times$  2

- i) Oxidation of D-fructose with Tollen's reagent yields a mixture of anions of D-mannonic acid and D-gluconic acid.
- ii) The purine nucleosides undergo faster acid hydrolysis than the pyrimidine nucleosides.
- iii) The mutarotation of D-glucose in benzene by 2-hydroxypyridine is faster than by a mixture of phenol and pyridine.

[ 3 ]

2. a) Discuss the retrosynthetic analysis and also the forward synthesis from easily available starting materials of the following compounds. (Attempt *any three*) 2  $\times$  3



[ Turn over