

Total No. of Printed Pages—16

5 SEM TDC CHM M 5 (N/O)

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(November)

CHEMISTRY

(Major)

Course : 505

(Organic Chemistry)

*The figures in the margin indicate full marks
for the questions*

(New Course)

Full Marks : 48

Pass Marks : 14

Time : 2 hours

1. Select the correct answer from the following :

1×5=5

(a) Thermal (conrotatory) ring opening of
trans-3,4-dimethyl cyclobutene gives

(i) *Z,Z*-hexa-2,4-diene

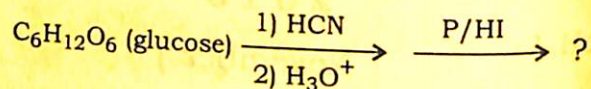
(ii) *E,E*-hexa-2,4-diene

(iii) *E,Z*-hexa-2,4-diene

(iv) *Z,E*-hexa-2,4-diene

(2)

(b) The product of the reaction



is

- (i) D-glucitol
- (ii) D-gluconic acid
- (iii) *n*-heptanoic acid
- (iv) 2-methyl heptanoic acid

(c) α -Terpineol is a

- (i) diterpenoid
- (ii) monoterpenoid
- (iii) sesquiterpenoid
- (iv) terpenoid

(d) Artemisinin is

- (i) an antimalarial drug
- (ii) an antibacterial drug
- (iii) a sulpha drug
- (iv) an antiseptic

(e) 2-Acetoxy benzoic acid is

- (i) antiseptic
- (ii) aspirin
- (iii) paracetamol
- (iv) disinfectant

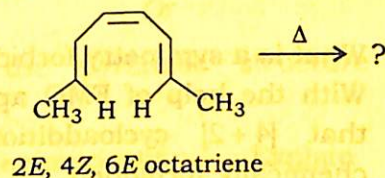
(3)

UNIT—I

Answer any **one** question

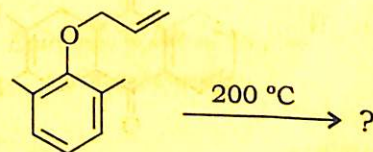
2. (a) Draw the MO of 1,3-butadiene indicating HOMO in the ground and excited states. 2

(b) Predict the stereochemical outcome from the following electrocyclic reaction : 1

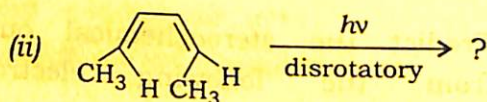
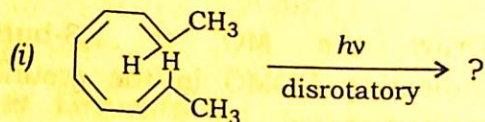


(c) The Diels-Alder reaction is a concerted [4 + 2] process. It proceeds with retention of configuration of both the diene and the dienophile. Explain with suitable examples. 1+1=2

(d) Complete the following reaction and suggest the mechanism : 2

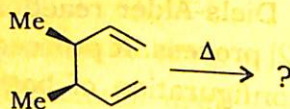


3. (a) Predict the stereochemical products obtained in the following electrocyclic reactions : 1×2=2

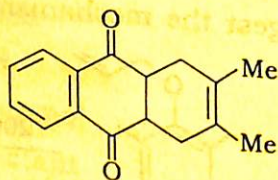


- (b) What is a symmetry forbidden reaction? With the help of FMO approach, show that [4+2] cycloaddition is photochemically forbidden. 1+2=3

- (c) Complete the following reaction :



- (d) What diene and dienophile would you employ to synthesize the following compound?



UNIT—II

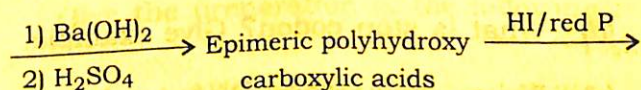
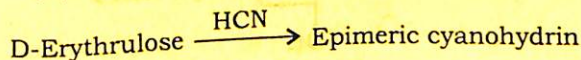
Answer **any one** question

4. (a) Sketch the stable conformational structure of α -D-mannopyranose. 1
- (b) How would you methylate the —OH groups of α -D-glucopyranose other than enomeric —OH group? 2
- (c) How is the configuration of D-glucose determined? Explain. 3

Or

Discuss the pyranose structure of D-glucose.

- (d) Define epimerization. Explain it considering the conversion of D-mannose to D-glucose. 1+2=3
- (e) What happens when D-erythrose is subjected to Ruff degradation? 2
5. (a) Convert D-fructose to D-glucose and D-mannose. 2
- (b) Complete the following reactions : 3



2-Methyl substituted carboxylic acid

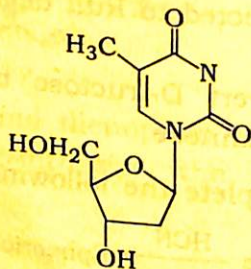
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- (c) How would you establish the ring structure of D-glucose?
- (d) Glucose and fructose give same osazone. Explain giving reactions.

UNIT—III

Answer any **one** question

6. (a) Draw the structure of the following (any one) :
- (i) dADP
- (ii) ATP
- (b) Synthesize one important purine present in both DNA and RNA.
- (c) Identify the base and monosaccharide used to form the following nucleoside and then name it :



- (d) What is stop codon? Give example.
- (e) Write, how the DNA molecule is replicated during cell division.

7. (a) What are coenzymes? Discuss their functions. 1+1=2
- (b) Write in brief about the Watson and Crick double-helix model of DNA. 3
- (c) What do you mean by the terms 'transcription' and 'translation'? 2
- (d) How are the following compounds related? 2

Adenosine and AMP

UNIT—IV

8. (a) Write in brief about the medicinal importance of curcumin. 2
- (b) Synthesize chloroquine using the following sequential steps : 1+1+1=3

Step I : AAE to 5-diethyl amino 2-aminopentane

Step II : *m*-Chloroaniline + Oxalyl acetic ester → 4,7-dichloroquinoline

Step III : 4,7-dichloroquinoline + 5-diethyl amino, 2-amino pentane → Chloroquine

Or

Give the preparation of the following :

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

- (i) Sulphaguanidine from acetanilide
- (ii) Ibuprofen by using green method

(Turn Over)

(8)

(c) What are antipyretics? Synthesize a drug which is used to bring down body temperature during fever.

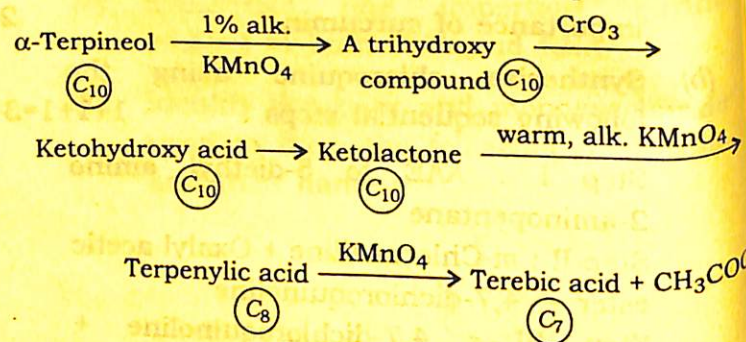
(d) Write down the laboratory synthesis of chloramphenicol.

UNIT—V

9. (a) Synthesize citral starting from acetylene and acetone.

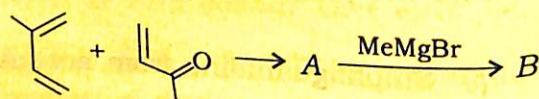
Or

Complete the following oxidative degradation reactions of α -terpineol :



(b) What are geraniol and nerol?

(c) Find out A and B in the following reaction :



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(Continued)

(9)

(Old Course)

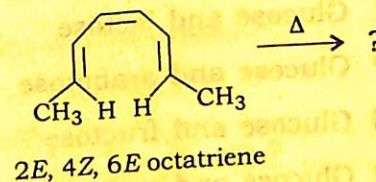
Full Marks : 48

Pass Marks : 19

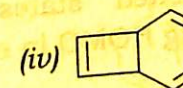
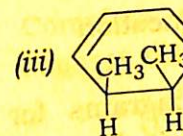
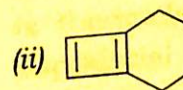
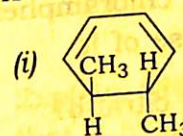
Time : 3 hours

1. Select the correct answer/Answer the following : $1 \times 5 = 5$

(a) The product obtained during the thermal reaction



is



(Turn Over)

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