QP Code : 75281

(3 Hours) Total Marks : 100

Note :(1) All questions are Compulsory.
(2) Figures to the right indicate full marks.
(3) Answers to the two sections should be written in separate answer books.
(4) Use of non-programmable calculator is allowed.

Section I

1 a) Write the mechanism for the reaction of acetone with ethylamine. 3

OR

a) Explain E_1 mechanism. 3
b) Explain the use of Lindlar's catalyst in organic synthesis with a suitable example. 2
c) Explain the advantages of phase transfer catalyst in organic synthesis. 3
d) With a suitable example explain the term plane of Symmetry. 2

OR

d) Discuss the stereochemistry of allenes 2

2 a) Discuss the mechanism of benzilic acid rearrangement. 5

OR

a) Discuss the mechanism and one application of Michael addition. 5

Attempt **Any Three** of the following

b) Write structure of the following :- 5
i) bicyclo [2.2.1] heptane
ii) 4, 4^1 - demethyldiphenyl
iii) azine - 3 - carboxylic acid
iv) 1, 2 - hexadiene
v) spiro [2.2] pentane

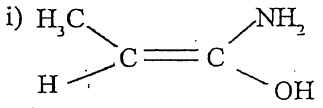
c) Explain the use of the following reagents in organic synthesis 5
i) $NaBH_4$ ii) NBS

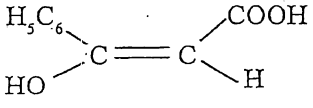
d) I. Give any three applications of C_6H_5MgBr 3

II. What is Simmons Smith reaction? 2

e) Distinguish between kinetically and thermodynamically controlled reactions. 5

3. a) I) Assign E/Z notation to the following compounds. 3

i) 

ii) 

3. a) II) Define the term topicity. Give an example of enantiotopic ligand. 2

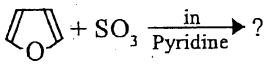
OR

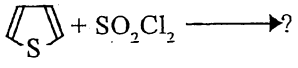
a) I) Discuss the stereochemistry of SN^1 reaction. 3

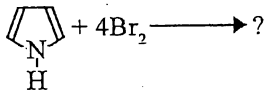
II) Explain the term angle strain. 2

Attempt **any three** of the following:-

b) I) Complete the following reactions. 3

i)  ?

ii) 

iii) 

II) Draw the resonance structures of furan. 2

c) Give the synthesis of the following :- 5

i) Vanillin ii) Nalidixic acid

d) I) Draw the chair conformations of methylcyclohexane and discuss their relative stabilities 3

II) Discuss the stereochemistry of the catalytic hydrogenation of alkenes with a suitable example. 2

e) I) Explain why nucleophilic substitution reaction in pyridine take place at 2 and 4 positions. 3

II) Give Paal Knorr synthesis for pyrrole. 2

Section II

4 a) Explain the use of split tube thief in sampling of solids. 3

OR

a) Define the following 3

i) Gross sample ii) Sub sample iii) Population

b) Explain the role of monochromator in spectrophotometer. Mention different types of monochromators. 3

c) Mention different types of acid-base titrations with appropriate example. 2

d) Write any two limitations of AAS 2

OR

d) State Nernst's distribution law 2

5. a) Define the terms. (i) Accuracy (ii) Precision 5
In replicate analysis for haemoglobin of blood samples containing 13.9 g/dl of haemoglobin, the results obtained are as follows

Sample No.	1	2	3	4
Haemoglobin content g/dl	12.5	12.8	13.5	13.1

calculate absolute error & relative error in ppt for each observation

OR

5. a) In replicate analysis of a metal ore, the following results were obtained. 5

Sample No.	1	2	3	4	5	6
% Metal	55.13	55.16	55.14	55.15	55.12	55.15

Calculate (i) mean (ii) average deviation (iii) standard deviation (iv) variance

Attempt **any three** of the following

b) Describe Volhard's method for the estimation of halides. 5

c) What are the different types of EDTA titrations? Explain any two methods with suitable example 5

d) Mention diffrent methods used for reduction of sample size of a solid sample. Explain any one method in detail. 5

e) Explain the use of dipenylamine indicator in redox titrations. What is the fuction of H_3PO_4 in such titrations? 5

6. a) Explain the term "separation factor". 5
200cm^3 portion of an aqueous solution containing 0.1 mole of a certain isolute is extracted twice with 25 cm^3 of ether.
Calculate (i) the amount of solute remaining unextracted (ii) the percentage extraction.
[Given : $D_{o/w}$ =12

OR

a) The distribution ratio 'D' for an organic solvent and water for a given solute is 20 in favour of organic solvent. Calculate the percentage extraction for a volume ratio $\frac{V_o}{V_{aq}}$ of (i) 1 for a single extraction 5
ii) 10 for two extractions.

Attempt **any three** of the following

b) With the help of a diagram, explain the working of flame photometer. 5

c) Explain ascending and descending chromatographic techniques used in paper chromatography. 5

d) Explain the principle of size exclusion chromatography and write any three applications of the method. 5

e) Describe the KBr pellet method and the mull method for the handling of solid samples in IR analysis. 5
