

B.Sc. Semester – 5 (Remedial) (CBCS) Examination

Feb/Mar. -2021 (NEW COURSE)

Organic Chemistry and Spectroscopy (Core)

Time: 1:30 Hours

Marks: 42

Instructions:

1. Figures to the right indicate marks.
2. There are five questions in the question paper.
3. Answer any three of the following questions.

Q-1 A) Answer the following question.

[04]

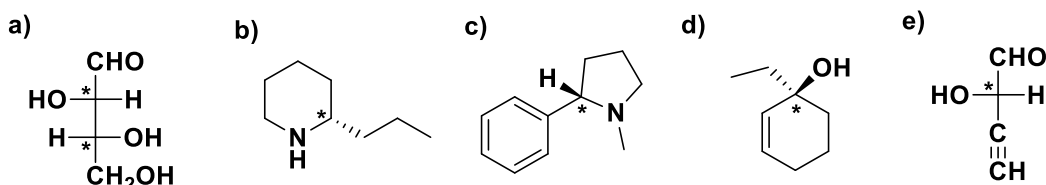
(1) Give the synthesis of thyroxine.

Q-1(B) Answer any two questions out of three.

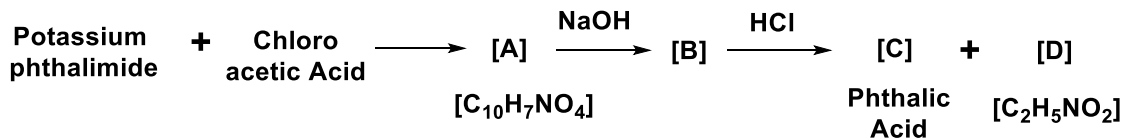
[10]

(1) Give the synthesis of dipeptide (Ala-Gly) by Bergemann method and Sneechn's method.

(2) Give R/S notation to chiral centre of following compounds.



(3) (a) Give the synthesis of Saccharin and its uses.

(b) Complete the following synthesis of α -amino acid and give the name of Product.[D] .

Q-2 A) Answer the following question.

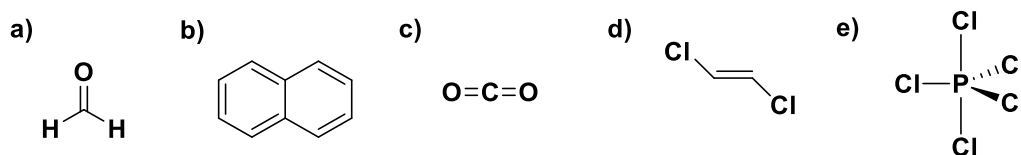
[04]

(i) Explain different types of plane of symmetry.

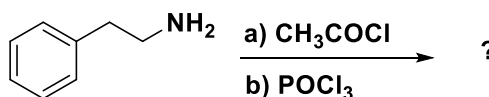
Q-2(B) Answer any two questions out of three.

[10]

(1) Give point group and order of the point group of following molecules,



(2) Complete the following reaction with proper Mechanism and also give the Name of reaction.



(3) Find out structure of alkaloid (saturated heterocyclic compound) having molecular weight 127 gm/mole from following statements (define each statement),

- a) Element analysis result, C: 75.52 %; H: 13.47 % and N: 11.01 %,
- b) It form quaternary ammonium salt by consuming two mole of Methyl Iodide,
- c) It undergo oxidation to give pyridine 2-carboxylic acid,
- d) It undergoes Von braun's degradation to give 1,5 dibromooctane (alkaloid + Benzoyl chloride + PBr₅ + low temp., Distillation).

Q-3 (A) Answer the following question. [04]

(1) Explain the factors affecting chemical shift in NMR spectra.

Q-3 (B) Answer any two questions out of three. [10]

(1) Give the synthesis and uses of Ibuprofen and Chrysodine-G.

(2) Write a note on "General Fragmentation Modes" in mass spectroscopy.

(3) Explain 1) NMR spectra of Cyclohexane at different temperature.

2) Deuterium labelling.

Q-4 (A) Answer the following question. [04]

(1) Discuss the different conformation of Cyclohexane and compare it through their potential energy diagram.

Q-4 (B) Answer any two questions out of three. [10]

(1) Prove that $S_6^3 = i$ & $S_6^6 = E$ by example of staggered Ethane.

(2) a) Explain shielding and deshielding effect.

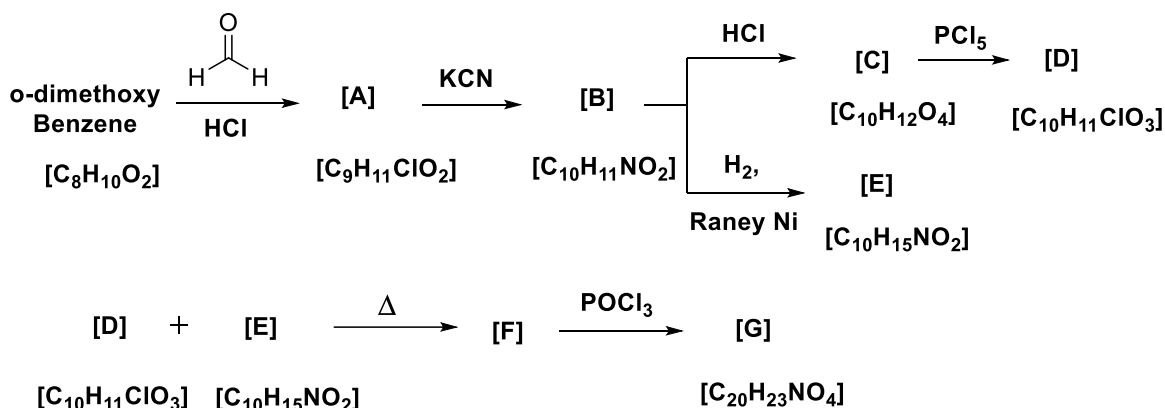
b) Why TMS is used as a reference in NMR spectroscopy.

(3) a) Give the synthesis of Adrenaline by using Catechol and Monochloro acetyl chloride.

b) Give the reaction of Glycine with Ethanol, HNO_2 and Acetic anhydride in pyridine.

Q-5 (A) Answer the following question. [04]

(1) Complete the following reaction.

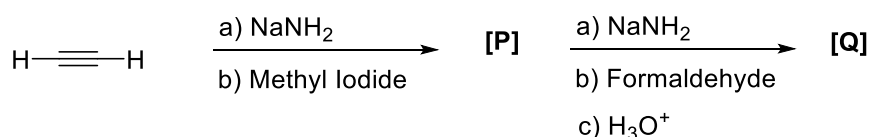


Q-5 (B) Answer any two questions out of three. [10]

(1) Give the possible chain isomer of Pentane and also give the possible signals with multiplicity of each isomer in PMR.

(2) a) Prove the presence of methylene group in Papaverine.

b) Complete the following reaction.



(3) Give the example of C_{2v} point group and construct its multiplication table.
