This question paper contains 4 printed pages.

6847 *Your Roll No*

M.Sc. – Ph.D. Biomedical Sc. / II Sem. J

Paper— CHM–108

ADVANCED ORGANIC CHEMISTRY – II

Time 3 hours *Maximum Marks* : 75

(Write your Roll No on the top immediately on receipt of this question paper)

Attempt any six questions
All questions carry equal marks.

SECTION A

1. Attempt any *three* parts:

   (*a*) Write the mechanism of a reaction catalysed by TPP.

   (*b*) What are the three biologically active forms of tetrahydrofolate?

   (*c*) Provide the mechanism of a reaction catalysed by alcohol dehydrogenase

   (*d*) Differentiate between the terms general acid and general base catalysis.

2 Attempt any *three* parts

   (*a*) Provide the structures of the following:

P T. O.

(*i*) Biotin

(*ii*) FMN

(*b*) Why is vitamin B12 called cyanocobalamin?

(*c*) Provide the mechanism of a reaction catalysed by biotin

(*d*) What is the function of coenzyme lipoic acid?

3. Attempt any *three* parts:

(*a*) Write a short note on conformational analysis of monosaccharides.

(*b*) Write the mechanism of mutarotation and discuss the anomeric effect in aldoses.

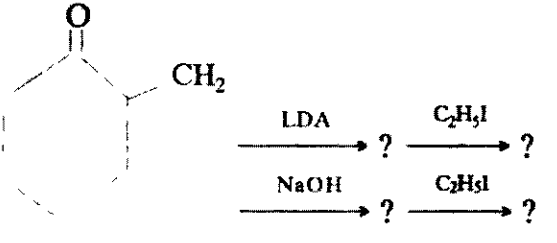
(*c*) Write the mechanism of ring contraction in aldohexoses

(*d*) Establish the structure of sucrose.

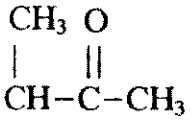
4. Attempt any *three* questions:

(*a*) Write short note on crown ethers.

(*b*) Show the product of the following reaction:



(*c*) Give scheme for the synthesis of following using ethyl acetoacetate (show mechanism):

(*i*) 

(*ii*) $CH_3-CH_2-CH_2-COOH$

(*d*) Complete the following reaction and predict the stereochemistry of the product *C*·

$$C_6H_5CH_2Br+Ph_3P \longrightarrow A \xrightarrow[\text{base}]{\text{strong}} B$$

$$B+C_6H_5CH_2CHO \longrightarrow C$$

5. Attempt any *three* parts:

(*a*) Define the term Umpolung. Explain using example of transketolase reaction

(*b*) Give examples of *two* reagents used as sulphur ylides. Comment upon their stability and reactivity.

(*c*) Give example of *one* PTC and explain mechanism of reaction catalyzed by them. How are these advantageous in carrying out organic synthesis?

(*d*) Complete the following reaction (show mechanism)·

$$Ph_3P+CH_3Br \longrightarrow A \xrightarrow{PhLi} B \xrightarrow{RCHO} C$$

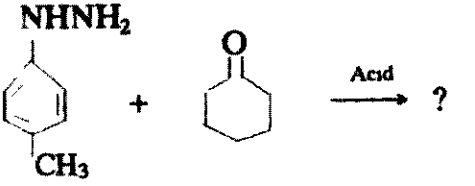
P. T. O.

6. Attempt any *three* parts:

(*a*) Explain the electrophilic substitution reaction in pyridine and quinoline.

(*b*) Comment upon the chemical reactivity of indole and pyrrole.

(*c*) Write the product of the following reaction with mechanism:



(*d*) Give examples (2 each) and write structures of natural products containing acridine and carbazole nucleus.

7. Attempt any *three* parts:

(*a*) Explain the phosphotriester approach for oligonucleotide synthesis.

(*b*) Write down steps involved in solid phase synthesis of oligonucleotides.

(*c*) Give synthetic scheme for the synthesis of guanine and adenine.

(*d*) Write the mechanism of peptide synthesis using protected amino acids.

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