M.Sc. 4th Semester Examination, 2021

CHEMISTRY

(Organic Chemistry Special)

Paper : CHEM 401E

Course Id : 41451

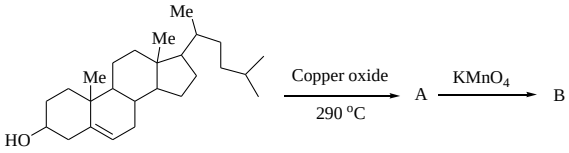
Time: 2 hours **Full Marks: 40**

The figures in the margin indicate full marks

Candidates are required to give their answers in their own words as far as practicable

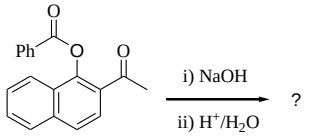
1. Answer *any five* of the following questions: 2×5 = 10

(a) Complete the following reaction sequence.



(b) Describe the basic feature(s) of "Receptor".

(c) Predict the structure of the product formed in the following reaction.



(d) Among pyridazine, pyrimidine and pyrazine which one has higher boiling point and why?

(e) What is "Antivitamins"? Give an example.

(f) Define vicarious nucleophilic aromatic substitution reaction. Give one example.

(g) Write two basic principles of chromatographic process.

2. Answer *any four* of the following questions: 5×4 = 20

(a) Identify the products formed in each of the following reactions and provide the plausible mechanism. 2.5+2.5 = 5

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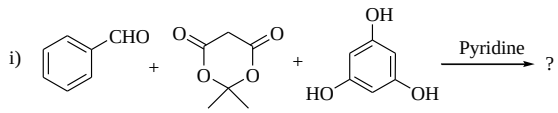
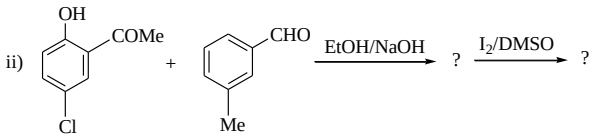
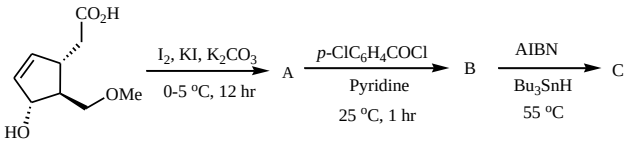




(b) Predict the products **A** to **C** formed in the following sequence of reactions with viable mechanism. 5

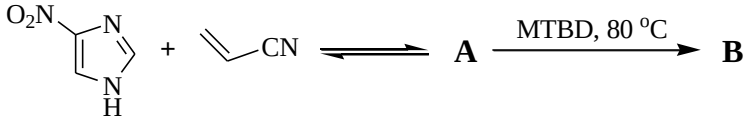


(c) Describe the common techniques used for detecting colourless spots in TLC. Write down the essential criteria for selection of suitable solvents for paper chromatography. 5

(d) What is 'Therapeutic Index'? Write the difference of drug and medicine. Mention the criteria of agonist.

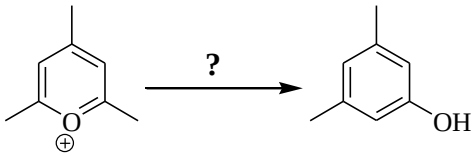
1+2+2 = 5

(e) (i) Describe the biochemical role of Vitamin K.
(ii) Draw the structures of **A** and **B**.



3+2 = 5

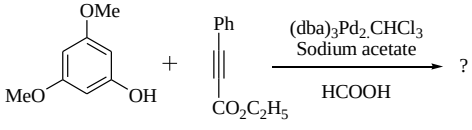
(f) Write down the missing reagent in the following reaction. Give a plausible mechanism of the following conversion.



1+4 = 5

3. Answer *any one* of the following questions: 10×1 = 10

(a) (i) Identify the major product of the following reaction with plausible mechanism.
What is the role of HCOOH in the reaction mixture?



(ii) Give the stereochemistry of $PGE_{2\alpha}$ and $PGF_{2\alpha}$.

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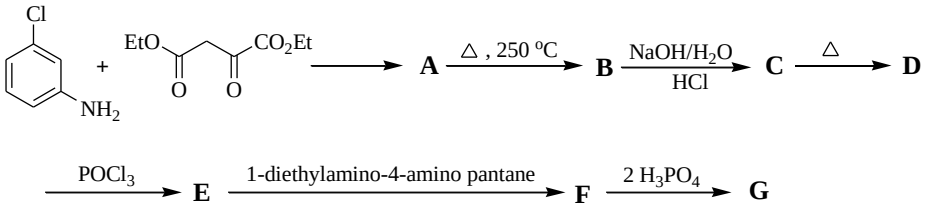
(iii) Write down the structures **A-G** formed in the following sequence of reactions.



(1+2.5+1)+2+3.5 = 10

(b) (i) Synthesize pyridoxol (Vit B6) using a suitably substituted 1,3 azoles.

(ii) Mention three factors which influence the R_f value of a compound. What are the essential characteristics of the substances used as a developer? 5+5 = 10