UNIVERSITY OF SWAZILAND
FIRST SEMESTER FINAL EXAMINATION 2014/2015

TITLE OF PAPER	:	Methods of Organic Synthesis
COURSE NUMBER	:	C602
TIME	:	Three Hours
INSTRUCTIONS	:	Answer any **FOUR Questions**. Each Question carries 25 Marks.

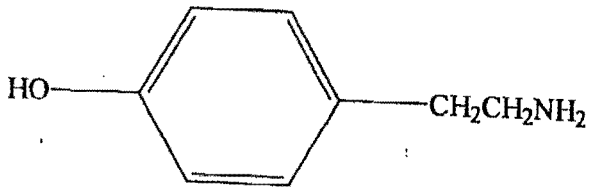
This Paper contains five (5) pages.

You must not open this paper until the Chief Invigilator so has granted permission to do.

Question 1

Tyramine is an alkaloid found, among other places, in ripe cheese. Outline a scheme, with all the necessary reagents and conditions, for the synthesis of tyramine from benzene.

(25 marks)



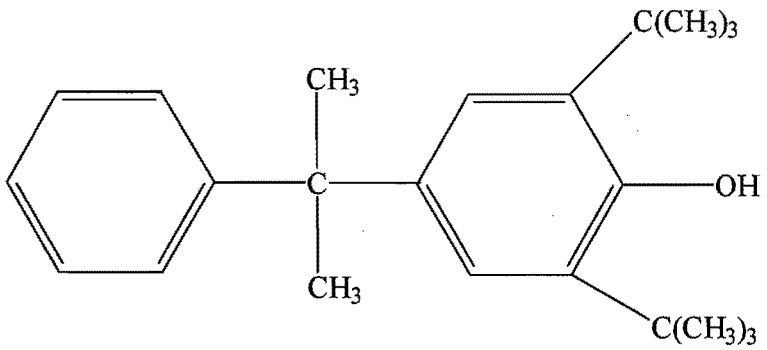
Tyramine

Question 2

(a) Suggest a synthesis route for cis-2-hexene from 1-pentyne and an alkyl halide.

(12 marks)

(b) The compound MON – 0585 is a non toxic, biodegradable larvicide that is highly selective against mosquito larvae. Synthesize MON-0585 using either benzene or phenol. (13 marks)



MON-0585

Question 3

Discuss the reactions named *vide infra* using suitable examples, and show the importance of each reaction in synthesis of organic molecules.

(i) Epoxidation reaction

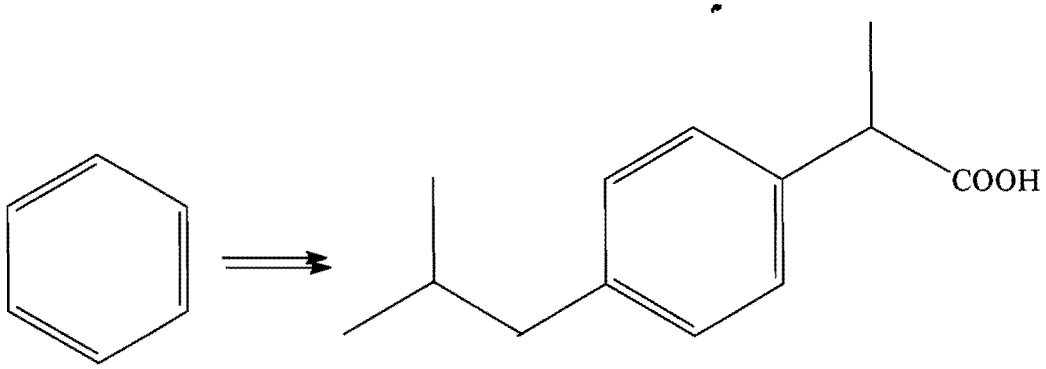
(ii) Robinson Annulation reaction

(iii) Wittig Reaction

(25 marks)

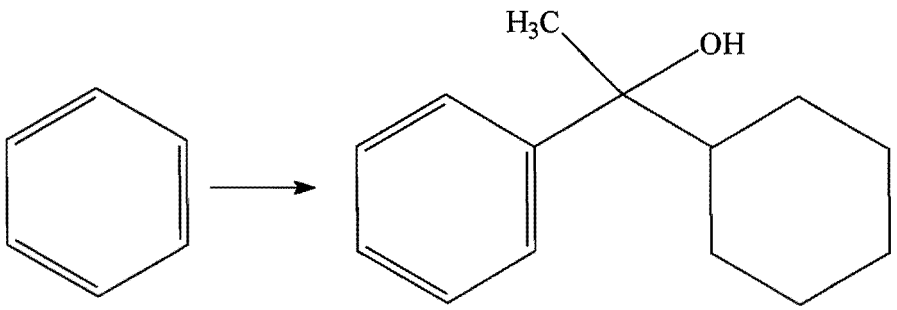
Question 4

(a) Show how you might prepare the anti-inflammatory agent ibuprofen starting from benzene and other suitable reagents. (25 marks)



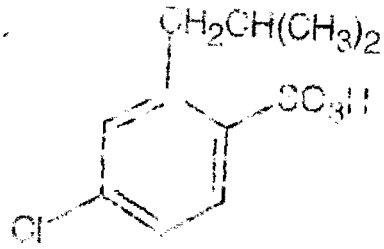
Question 5

(a) Outline the synthetic steps necessary to carry out the conversion below. You may use any organic or inorganic reagents you need. Show the structures of all intermediate compounds that would probably be isolated during the course of your synthesis, and show all necessary reagents.

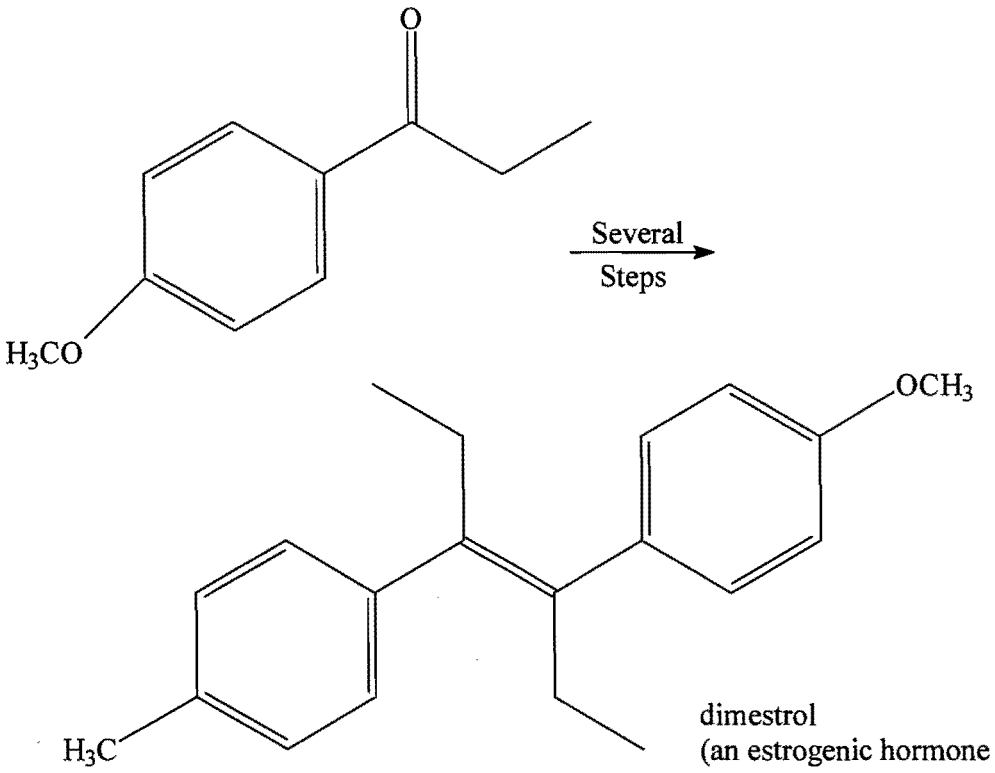


(8 marks)

(b) Outline a synthesis route from benzene to the following compound. Show the major reagents for each step. (8 marks)



(c) Propose a synthesis of Dimestrol starting from p-methoxypropiophenone as the only source of carbon.

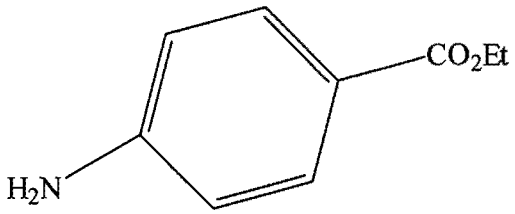


dimestrol
(an estrogenic hormone

(9 marks)

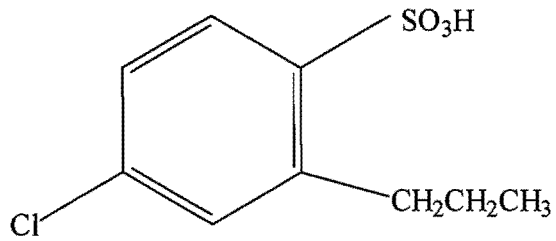
Question 6

(a) Ethyl-4-aminobenzoate (Benzocaine) is a local anaesthetic with a range of applications. Outline a laboratory synthesis route to benzocaine from benzene. (8 marks)



Benzocaine

(b) Describe an efficient synthesis of 4-chloro-2-propyl-benzenesulphonic acid. Show all the reagents for each step of the route. (8 marks)



4-chloro-2-propylbenzenesulphinic acid

(c) Show how you would accomplish the following transformation. More than one step may be required. Show all reagents and all intermediate structures. (9 marks)