



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF APPLIED SCIENCES

DEPARTMENT OF APPLIED CHEMISTRY

ORGANIC CHEMISTRY II (FOR SCH STUDENTS ONLY)

SCH 1202

Supplementary Examination Paper

August 2015

This examination paper consists of 5 printed pages

Time Allowed: 3 hours

Total Marks: 100

Special Requirements: None

Examiner's Name: Dr C T Parekh

INSTRUCTIONS

1. Answer All questions from section A and Any three from section B.
Section A carries 40 Marks and each question in section B carries 20 Marks.
2. Start new question on a new page. (not each part of a question).
3. Show mechanism, chemical steps or synthesis by means of curved arrows.

MARK ALLOCATION

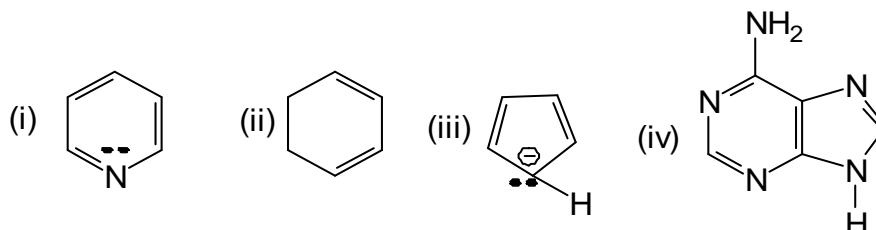
QUESTION	MARKS
1	40
2.	20
3.	20
4.	20
5	20
TOTAL POSSIBLE MARKS	100

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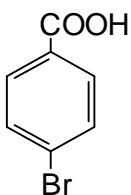
SCH 1202

SECTION A

1. (a) Explain Huckel's rule in your own words. (4 Marks)
- (b) State whether the following compounds are aromatic or non-aromatic and also indicate the number of pi electrons present in the compounds.



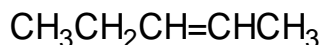
- (c) What are anomers? (4 Marks)
- (d) With an appropriate example, explain a zwitter ion. (2 Marks)
- (e) Draw equilibrium structures of enol-keto forms. Suggest the type of structural isomer. (4 Marks)
- (f) Draw isomeric structures for the molecular formula C_7H_7OH . (4 Marks)
- (g) Indicate with the arrow, where would you expect electrophilic substitution to occur in the following compound? Give your reasons.



- (h) Explain with the aid of chemical equations why phenol is more acidic than ethanol. (4 Marks)
- (i) Outline the synthesis of 4-bromo propylbenzene from benzene. Use reagents of your choice. (6 Marks)
- (No mechanism required). (4 Marks)
- (j) What is an isoelectric point? (4 Marks)

SECTION B

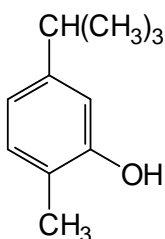
2. (a) Draw the structures of an ylide and a carbonyl compound from which the following compound can be prepared.



Outline the possible synthesis of ylide starting from triphenyl-phosphine, suitable alkyl halide and the reaction mechanism of this reaction. What is the name of the reaction?

(10 Marks)

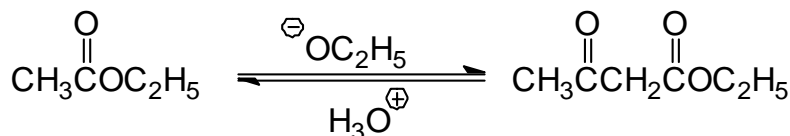
- (b) Carvacrol is a natural product isolated from herbs such as oregano, thyme and marjoram. Synthesise carvacrol from benzene. Use reagents of your choice. (No mechanism required).



carvacrol

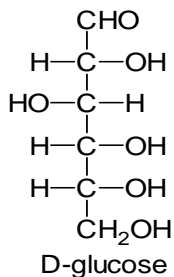
(10 Marks)

3. (a) Explain, with the aid of chemical structures, why pyridine is more basic than pyrrole. (10 Marks)
- (b) With the aid of chemical structures, explain why trichloroethanoic acid is more acidic than ethanoic acid. (5 Marks)
- (c) Suggest the mechanism for the following Claisen condensation reaction.



(5 Marks)

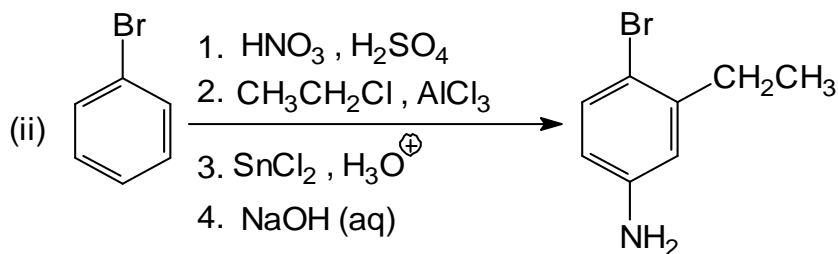
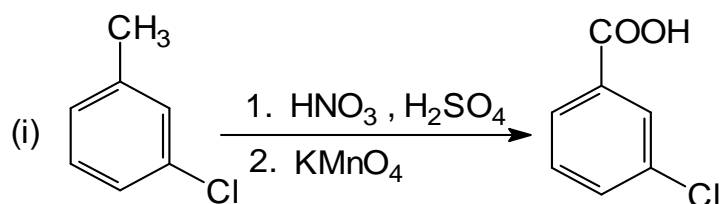
4. (a) You are given following monosachharide:



Write the reaction mechanism for the Haworth projection and also indicate the type of reaction involved. (4 Marks)

(b) trans-1,2-dichloro cyclohexane is more stable than its cis isomer. Explain this observation with appropriate chair conformations. (6 Marks)

(c) The following synthetic routes are incorrect. Explain what is wrong with each and how you would correct the route(s) to obtain the given products.

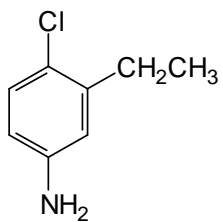


(4 + 6 Marks)

5. (a) With the aid of chemical reactions why do you think Friedel-Craft acylation is a useful reaction?

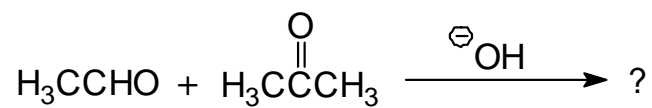
(7 Marks)

(b) Propose synthesis for the following compound from benzene. Use reagents of your choice. (No mechanism required).



(8 Marks)

- (c) Write reaction mechanism for the following reaction and indicate the type of reaction that has taken place.



(5 Marks)

*****END OF QUESTION PAPER*****