National Open University Of Nigeria
Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi - Abuja
Faculty of Science

October/November 2016 Examination

COURSE CODE: CHM 416
COURSE TITLE: ORGANIC SYNTHESIS

CREDIT UNIT: 2

TIME: 2 HOURS

INSTRUCTION: ANSWER QUESTION ONE AND ANY OTHER THREE QUESTIONS

1a.Oxidation reactions constitute a veritable tool in organic synthesis. Discuss two examples of organic synthetic procedure that involve oxidative transformations. (9 marks).
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1b) Osmium tetroxide (OSO_4) or potassium permanganate ($KMnO_4$) in aqueous base reacts with alkenes to yield 1,2-diol, DISCUSS. (8 ½ MARKS)

2. Alkenes are oxidized readily by permanganate, $KMnO_4$, but the products depend on the reaction condition, explain the conversion of alkenes to syn-1,2-diols via hydroxylation. (17 ½ Marks)

3a) Describe the Diels-Alder reaction. (5 marks)

3b)With the aid of relevant equation/scheme, describe the formation of cyclohexene from ethane aqnd 1,3-butadiene

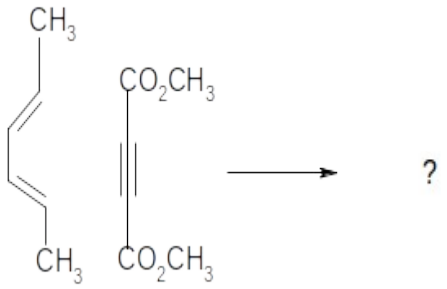
3c) present a scheme for the synthesis of cortisone via Diel-Alders reaction.

(Total = 12 ½ Marks)

4a) Give a general scheme for the Wittig reaction. (6 ½ marks)

4bi) Identify the major product of the reaction: (2 marks),

4bii) Explain your answer in (4bi) above. (4 marks)



4c) State the advantages of wittig reaction. (5 marks)

5a) The compounds having the general formula RCO_3H are called _____. (2 ½ marks)

5b) List any four members of this group. (6 marks)

5c) Discuss the oxidation of ketones by peroxy-acids. (9 marks)

6) One of the most important examples of Diels-Alder reaction was in total synthesis of compounds:

i. List three of the synthesis.

Ii Give the scheme for any two synthesis mentioned in (6i) above.