



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF BIOLOGICAL AND PHYSICAL SCIENCES
UNIVERSITY EXAMINATIONS: 2020/2021 ACADEMIC YEAR
FOURTH YEAR SECOND SEMESTER EXAMINATIONS

SCH 405: SYNTHETIC ORGANIC CHEMISTRY
SPECIAL EXAMINATIONS

ANSWER ALL QUESTIONS IN SECTION A AND ANY TWO QUESTIONS IN SECTION B
SECTION A (30 MARKS): ANSWER ALL QUESTIONS

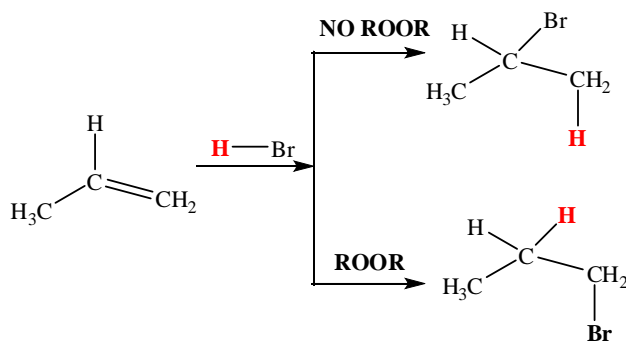
QUESTION 1 (30 MARKS)

a) Distinguish between the following terms; (10 marks)

- i) Carbanion and carbene
- ii) Inductive effect and electronegativity
- iii) Linear and divergent synthesis
- iv) SN1 and SN2 reaction mechanism
- v) Secondary and tertiary carbocation

b) State and explain the importance of Organic synthesis (any Five); (10 marks)

c) i) Distinguish between the following reaction mechanisms; (5 marks)



ii) Which fundamental principle is reaction in c) (i) above represent?
Explain your answer.

(5 marks)

SECTION B (40 MARKS):

ANSWER ANY TWO QUESTIONS FROM THIS SECTION

EACH QUESTION CARRIES 20 MARKS

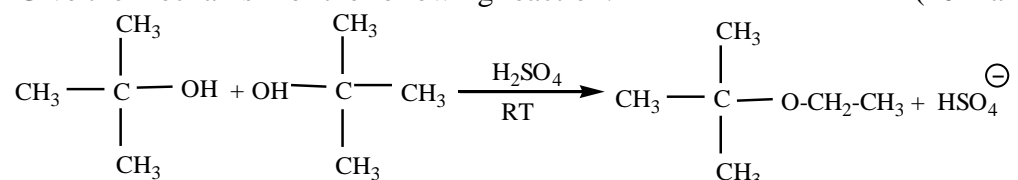
QUESTION 2 (20 marks)

Outline the mechanism of oxy-mercuration-de-mercuration. (20 marks)

QUESTION 3 (20 marks)

a) State and explain the limitations of Organic Synthesis (any Five) (10 marks)

b) Give the mechanism of the following reaction: (10 marks)



QUESTION 4 (20 marks)

a) Explain the following terms as used in Organic synthesis: (10 marks)

- i) Reaction mechanism
- ii) Retrosynthesis
- iii) Methodology
- iv) Reagent
- v) Substrate

b) Explain the Grignard Synthesis of alcohols (5 marks)

c) Briefly discuss how the following factors can influence reaction rates.

- i) Solvent effect (1 mark)
- ii) Temperature (2 marks)
- iii) Catalysis (2 marks)

QUESTION 5 (20 marks)

Outline the synthesis of;

- i) Quinines (10 marks)
- ii) Nicotine (10 marks)

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