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**MASINDEMULIROUNIVERSITY OF  
SCIENCE AND TECHNOLOGY**

**(MMUST)**

**MAIN CAMPUS**

**UNIVERSITY EXAMINATIONS**

**2021/2022 ACADEMIC YEAR**

**FOURTH YEAR FIRST SEMESTER EXAMINATIONS**

**FOR THE DEGREE**

**OF**

**BACHELOR OF SCIENCE (CHEMISTRY)**

**COURSE CODE:** SCI 463 SUPP/SPECIAL EXAM

**COURSE TITLE:** NATURAL AND SYNTHETIC PHARMACEUTICAL  
PRODUCTS

**DATE:** 29/07 /2022

**TIME:** 11.00-1.00 pm

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**INSTRUCTIONS TO CANDIDATES**

Answer all the Questions

**TIME:** 2 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 5 Printed Pages. Please Turn Over. ▶

### QUESTION ONE (15 marks)

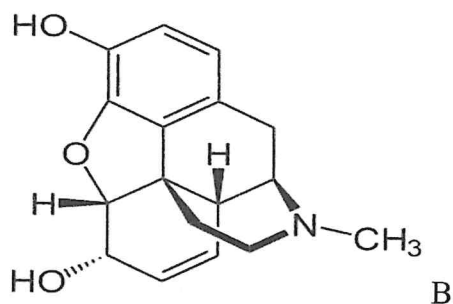
- a. Define the following in relation to pharmacology (8mks)
- i. Pharmacophore
  - ii. Analgesic
  - iii. Prodrug
  - iv. Lead compound
- b. i. What are the four components of pharmacokinetics? (4mks)
- ii. With reference to drug composition, state the meaning and the importance of excipients. (3mks)

### QUESTION TWO (15 marks)

- a. Some drugs are referred to **scheduled drugs**. Such drugs are classified into five distinct categories or schedules
- i. Give two characteristics of scheduled drugs (2mks)
  - ii. Explain the trend in categories from I, II, III, IV to V (3mks)
  - iii. Give one example of a drug in category I, II and V (3mks)
- b. NSAIDs, is a short word for a group of drugs.
- i. Write the word in full (2mks)
  - ii. Give three examples of these drugs. (2mks)
  - iii. Use a specified example to explain their mode of action (3mks)

### QUESTION THREE (20 marks)

- a. State the meaning of the following;
- i. Bioavailability of a drug (2mks)
  - ii. Therapeutic index of a drug (2mks)
- b. Structure B below is an important human medicine,



- i. Identify the class of medicine to which structure B belong, (2mks)
  - ii. Name the drug (2mks)
  - iii. Name two other drugs in this group (2mks)
  - iv. Identify the drugs functional groups (3mks)
  - v. Compare activity of B with its analog C where a heterocyclic ring has replaced the hydroxyl groups. Give a possible supportive reason (2mks)
- c. Use retro synthetic approach to draw the synthesis of paracetamol. Label clearly the pythons and the reagents. (6mks)

#### QUESTION FOUR 20 MARKS

- a. Sulfonamides are a group of important drugs
  - i. Draw the structure of a named drug in this group (4mks)
  - ii. Briefly explain their mode of action using structure activity relation/SAR, with reference to paraamino benzoic acid ,PABA (6mks)
- b. Explain the following stages of drug development;
  - i. Pre-clinical stage (4mks)
  - ii. Clinical Phases, I, II and III. (6mks)