



KIBABII UNIVERSITY

**UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR**

**FIRST YEAR SECOND SEMESTER
MAIN EXAMINATIONS**

FOR THE DEGREE OF BSC CHEMISTRY

COURSE CODE: SCH 123

COURSE TITLE: LABORATORY TECHNIQUES II

DATE: 16/05/2022

TIME: 9:00AM-11:00AM

INSTRUCTIONS TO CANDIDATES:

- Answer **Question ONE (Compulsory)** and any other **TWO (2)** questions
- Indicate answered questions on the front cover
- Start each question on a new page and make sure the question's number is written on each page

TIME: 2 Hours

This paper consists of **5** printed pages. Please Turn Over 

KIBU observes **ZERO** tolerance to examination cheating

Question 1 [30 Marks]

- i. Explain why working alone in the laboratory is prohibited [2 Marks]
- ii. Highlight the uses and importance of a fume hood in a chemical laboratory [4 Marks]
- iii. Describe the uses of the following laboratory equipment [6 Marks]
 - a. pH meter
 - b. analytical balance
 - c. desiccator
- iv. Highlight some of the uses of test tubes and stirring rods [4 Marks]
- v. Explain why beakers and Erlenmeyer flasks are not used for volume measurements [2 Marks]
- vi. Highlight the glassware used for volumetric measurements [3 Marks]
- vii. Differentiate between autoignition temperature and flash point [2 Mark]
- viii. Discuss the precautions to be taken when heating volatile liquids with low autoignition temperatures [2 Marks]
- ix. Using a diagram highlight the difference between reflux and distillation [5 Marks]

Question 2 [20 Marks]

- i. Explain why water is referred to as a universal solvent [2 Marks]
- ii. Describe the procedure for the calibration of a volumetric flask and burette [14 Marks]
- iii. Note the major difference in the calibration procedure of the two types of volumetric glassware [4 Marks]

Question 3 [20 Marks]

- i. Identify 4 types of equipment used for heating reaction mixtures in the chemical laboratory [8 Marks]
- ii. Describe the types of materials to be heated in each of the above heating equipment [12 Marks]

Question 4 [20 Marks]

- i. A student is carrying out an experiment and needs to incubate a bacterial culture at 45 °C. Estimate the difference in temperature between the current reading and the desired temperature. [2 Marks]
- ii. Highlight one application of cooling baths [2 Marks]

Question 5 [20 Marks]

- i. Describe filtration [2 Marks]
- ii. Describe 5 methods used for the separation of solid-liquid mixtures [16 Marks]
- iii. Describe the use of an autoclave and its importance in a medical laboratory [3 Marks]