

CHUKA



UNIVERSITY

**UNIVERSITY EXAMINATIONS**

**RESIT/SPECIAL EXAMINATION**

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE AND  
BACHELOR OF EDUCATION (SCIENCE)**

**CHEM 101: CHEMICAL LABORATORY SAFETY AND SECURITY**

**STREAMS: BSC & BED SCI**

**TIME: 2 HOURS**

**DAY/DATE: THURSDAY 04/02/2021**

**2.30 P.M – 4.30 P.M.**

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**INSTRUCTIONS:**

- **Answer all questions**

**QUESTION ONE (30 MARKS)**

- a) Distinguish between acute and chronic exposure of chemicals (2 marks)
- b) Discuss the major chemical exposure routes in the body when handling chemicals in the laboratory (8 marks)
- c) Explain how the following equipment are used in the laboratory to provide safety (9 marks)
- Fume hood
  - Safety showers and eye wash stations
  - Biosafety cabinets
- d) State three conditions that must exist simultaneously for fire to occur (3 marks)
- e) State three (3) heating devices used in the laboratories (3 marks)
- f) You are recommended you wear appropriate personal protective equipment (PPE) when working with hazardous chemicals in the laboratory at all times. Discuss why this is important for your safety. (3 marks)

- g) List two (2) common cryogenes used in the laboratory (2 marks)

**QUESTION TWO (20 MARKS)**

- a) Explain the major phases to managing a large-scale emergency (8 marks)
- b) State four consulting sources of information in the laboratory (4 marks)
- c) Explain the following type of chemicals (8 marks)
- i. Corrosive substances
  - ii. Asphyxiants
  - iii. Reproductive and developmental toxins
  - iv. Carcinogens

**QUESTION THREE (20 MARKS)**

- a) State the general precautions to be taken when dealing with glass apparatus under vacuum (4 marks)
- b) Explain 3 causes of ignition (6 marks)
- c) Briefly explain the information found in a material safety data sheet (MSDSs) (6 marks)
- d) Explain the guidelines of cleaning up the following types of spills
- i. Materials of low flammability that are not volatile or that have low toxicity (2 marks)
  - ii. Flammable solvents (2 marks)
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