

CHUKA UNIVERSITY

**FOURTH YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF
BACHELORS OF BIOMEDICAL SCIENCE AND TECHNOLOGY**

Course code: BMET 443

Course Title: animal cell culture and biotechnology

TIME: 2 HOURS

INSTRUCTIONS

- Answer question **ONE (COMPULSORY)** and any other **TWO** questions.
- Sketch diagrams may be used whenever they may help to illustrate your answer.
- Do not write anything on the question paper.
- This is a closed book exam. **No** reference materials are allowed in the examination room.
- There will be **No** use of mobile phones or any other unauthorized materials.

1. QUESTION ONE (30 MARKS)

- a. Discuss the protocol adopted in an animal cell culture laboratory when thawing the cells for culture (6 marks).
- b. Discuss different phase of cell growth in animal cell culture laboratory (8 marks).
- c. Explain how viable and non-viable cells can be distinguished in an animal cell laboratory (6 marks).
- d. Discuss the procedure for cell passaging in the animal cell culture laboratory (6 marks).
- e. What is the different between the primary and continuous culture (4 marks).

2. QUESTION TWO (20 MARKS)

- a. Discuss the procedure for cell counting in animal cell culture laboratory using a hemocytometer (8 marks).
- b. What is the difference between embryonic stem cells, pluripotent stem cells, multipotent stem cells and germ cells? (8 marks).
- c. Give 8 basic constituents of media used in animal cell culture laboratories (4 marks).

3. QUESTION THREE (20 MARKS)

- a. You are working as a senior biomedical scientist in an animal cell culture laboratory. Describe the standard freezing procedure you can adopt for your laboratory (8 marks).
- b. Discuss three aseptic techniques employed in an animal cell culture laboratory to prevent and control microbial contamination (8 marks).
- c. What are four (4) applications of the monoclonal antibodies produced in animal cell culture laboratories (4 marks).

4. QUESTION FOUR (20 MARKS).

- a. Trypsinizing cell is a very important protocol in animal cell culture technology. Discuss the standard laboratory procedure for trypsinizing animal cells for culture (8 marks).

- b. Tabulate some of the commonly used antibiotics and antifungals used in animal cell culture. Indicate the working concentration for the antimicrobials, target

micro-organisms and the stability duration in terms of days at 37⁰C (8 marks).

- c. Discuss the process of cryopreservation and recovery of cryopreserved cells of animal cells in culture laboratory (4 marks).