CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

FOURTH YEAR SEMESTER ONE EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF BIOMEDICAL SCIENCE AND TECHNOLOGY

BMED 447: ANIMAL CELL CULTURE AND BIOTECHNOLOGY

STREAMS: BMED Y4S1 **TIME: 2 HOURS**

DAY/DATE: TUESDAY 04/12/2018 **2.30 P.M. – 4.30 P.M.**

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.
- Write your answers legibly and use your time wisely.

Instructions

- **Answer question one and any other two question**
- **Do not write on this question paper**

QUESTION ONE (30 MARKS) Compulsory

You are invited by a local university to present on an international scientific conference. The theme of the conference is: Applications of animal cell culture technology for better health.

a. Discuss some of the areas that you can emphasize concerning the application of animal cell culture and biotechnology. (8 marks)

b. Discuss some of the major advantages and disadvantages of using animal cell culture in biotechnology that you would emphasize to the congregation. (4 marks)

c. Explain to the congregation the meaning of the term Hayflick limit as applied in animal cell culture. (2 marks)

d. Demonstrate with a use of a diagram the major phases of a cell growth in a normal animal cell cultured in a biotechnology laboratory. (10 marks)

e. Explain to the congregation different techniques that can be used when selecting a particular cell type from a primary cell culture in an animal cell culture laboratory. (6 marks)

.

QUESTION TWO (20 MARKS).

For an animal cell line to grow in an animal cell culture laboratory, special and aseptic conditions are necessary.

a. Discuss some of the special conditions required for cell line growth. (8 marks)

b. Briefly explain some of the factors that should be considered when choosing cell lines. (4 marks)

c. Discuss some of the major characteristics of a normal cell in an animal cell culture as applied in animal cell culture laboratory. (8 marks)

QUESTION THREE (20 MARKS)

a. Embryonic stem cells are very important in the cultivation of animal cells in a laboratory. Enumerate and briefly explain some important properties of the embryonic stem cells. (8 marks)

b. Cell culture collection centers play a greater role in the field of biomedical sciences. Briefly enumerate some of major services offered by animal cell culture collection institutions. (4 marks)

c. You are working as a senior biomedical laboratory scientist in a well reputable research institution. Briefly explain some signs that can help you recognize that your animal cell culture samples are contaminated. (8 marks)

QUESTION FOUR (20 MARKS)

a. It is impossible to isolate and cultivate animal cells from a laboratory without some key equipments. Mention and briefly explain the use of the four laboratory equipment needed for a successful animal tissue culture. (4 marks)

b. The following terms are commonly used in the field of animal cell culture technology. Briefly explain their meaning in relation to the mentioned biomedical field. (4 marks)

(i) Hybridoma
(ii) Primary culture
(iii) Cell line
(iv) Cell strain

c. You are working as a biomedical scientist in an animal cell culture laboratory. Explain what you can do when you realize that your animal cell cultures are contaminated. (6 marks)

d. Briefly explain some of the organisms that can lead to contamination in animal cell culture technology. Specify the commonly used antimicrobial agents in animal cell culture medium to inhibit the growth of the microorganisms. (6 marks)
