CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

FOURTH YEAR EXAMINATION FOR THE AWARD OF

BACHELOR OF SCIENCE APPLIED COMPUTER SCIENCE

ACMP 445: COMPUTER ANIMATION

STREAMS: BSC (APPLIED COMP SCI.) **Y4S1** **TIME: 2 HOURS**

DAY/DATE:…… **……..**

INSTRUCTIONS:

- Answer question **ONE** and **TWO** other questions
- Sketch maps and diagrams may be used whenever they 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

SECTION A-COMPULSORY

QUESTION ONE (30 MARKS)

a) Define or explain the following terms, using relevant illustrations: **[10 marks]**
   i) Computer animation.
   ii) Inbetweening.
   iii) Frame.
   iv) Sampling rate.
   v) Rendering

b) Is there any difference between computer graphics and image processing? Explain **[4 marks]**

c) Describe the terms persistence and resolution in reference to CRT. **[4 marks]**

d) Explain any three devices used in computer animation. **[6 marks]**

e) Define the following: **[4 marks]**
   i) Point Clipping
   ii) Line clipping

f) Explain the RGB concept, in representing images on a 3-D screen. **[2 marks]**

SECTION B-ANSWER ANY TWO QUESTIONS

QUESTION TWO (20 MARKS)

a) Briefly explain Cel Animation **[2 marks]**

b) Explain three advantages of introducing dynamics into an animation control **[6 marks]**

c) Explain using illustrations and diagrams the following animation concepts:

   i) Key framing. **[3 marks]**

   ii) Interpolation. **[3 marks]**

   iii) Kinematics (Forward and Inverse). **[3 marks]**

   iv) Motion Capture. **[3 marks]**

QUESTION THREE (20 MARKS)

a) Describe the process of Animation **[8 marks]**

b) One principle of traditional animation is called "squash and stretch." Name and briefly explain three more principles. **[6 marks]**

c) Explain the concept of ray tracing and how it can be applied in rendering 3-D scenes

[6 marks]

QUESTION FOUR (20 MARKS)

a) Define the term Morphing with an example **[2 marks]**

b) Write the important applications of computer animation. **[6 marks]**

c) Describe a problem with using linear interpolation between key frames. **[6 marks]**

d) Given that a ball is falling from a height h=100 generate the animation sequence corresponding to the motion of this ball. Equation of motion is given as: $y = h - 0.5g\ t2$. Plot a simple graph to show the path taken by this ball. **[6 marks]**

QUESTION FIVE (20 MARKS)

a) Write the important applications of computer animation. **[6 marks]**

b) Define animation sequences and describe the various steps involved in animation sequence. **[6 marks]**

c) Define the following with an example: **[8 marks]**

   i) Morphing.

   ii) Types of animation system.