CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

FOURTH YEAR EXAMINATION FOR THE AWARD OF
BACHELOR OF SCIENCE APPLIED COMPUTER SCIENCE

ACSC 478: COMPUTER ANIMATION

STREAMS: BSC (APPLIED COMP SCI.)   **Y4S2**   **TIME: 2 HOURS**

DAY/DATE: TUESDAY 07/4/2020   **2.30 PM – 4.30 PM**

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 Computer animation.   **[2 marks]**

b) Hardware and software are two of the major factors that determine the quality of computer animation that is produced.State any two, hardware and software that are used in creating computer animations.**[4 marks]**

c) Explain the following terms: **[6 marks]**
   i. Rendering.
   ii. Morphing
   iii. Key frame.

d) Define the term texture mapping and briefly explain how it isapplied in computer animation.
   [4 marks]

e) Briefly explain how frame-by-frame animation works. **[4 marks]**

f) Describe any three traditional animation techniques. **[6 marks]**

g) Differentiate between 2D and 3D animation **[4 marks]**

SECTION B ATTEMPT ANY TWO QUESTIONS -40 MARKS

QUESTION TWO (20 MARKS)

a) Using suitable illustrations explain the following types of animation: **[6 marks]**
   i.   Cel Animation.

   ii. Cutout Animation.

   iii. Stop-Motion Animation.

b) Explain the relationship between screenplays and storyboards. **[4 marks]**
c) You have been approached by Chuka University management who wants to document the historical events of the university and its surrounding environment, demonstrate using storyboards how you will document the events to create the required scene (Recommended software demo if **any** is blender).   **[10 marks]**

QUESTION THREE (20 MARKS)

a) Using the concept of Interpolation, demonstrate the behavior of a ball thrown up and then falling down.**[4 marks]**

b) Describe two weaknesses of interpolation method in Animation. **[4 marks]**

c) Compare and contrast between character animation and effects animation.**[6 marks]**

d) Using a suitable demonstration, explain how static photographs can be converted into moving Images and create a realistic scene in an animated movie.   **[6 marks]**

QUESTION FOUR (20 MARKS)

a) Describe the problem with the use of linear interpolation between key frames. **[3 marks]**

b) Differentiate between a joint and a skeleton in animation of articulated bodies. [**4 marks**]

c) Given that a ball is falling from a height h=120 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]**

d) Forces and torques are used in providing dynamics in articulated bodies. Explain these two terms and outline any three advantages of introducing dynamics into articulated bodies.**[7 marks]**

QUESTION FIVE (20 MARKS)

a) Explain the relationship between interpolation and Key framing.   **[4 marks]**

b) Demonstrate using a suitable example how scene layout is used to create computer animations.   **[4 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]**