PAN AFRICA CHRISTIAN UNIVERSITY
EXAMININATIONS PAPER

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BACHELORS OF INFORMATION COMMUNICATION TECHNOLOGY

END OF TERM EXAMINATION

DEPARTMENT:	**COMPUTING & INFORMATION TECHNOLOGY**
COURSE CODE:	**BSIT_BBIT400**
CAMPUS:	**ROYSAMBU**
COURSE TITLE:	**COMPUTER GRAPHICS AND ANIMATION**
EXAM DATE:	**TUESDAY**
TIME:	**START HOUR – 8.00AM-10.00AM**

INSTRUCTIONS

- This exam carry a total of SIX Questions of [10 Marks Each]
- Section One (I) is compulsory.
- Answer any 3(Three) Questions from Section Two (II)
- Read all questions carefully before attempting.

SECTION A
(Answer ALL questions in this section)

Question 1 (10 Marks)

a) Explain two advantages of using Graphical User Interfaces. (2 Marks)

b) Distinguish between Emissive and non-emissive displays. (2 Marks)

c) Explain glClear(GL_COLOR_BUFFER_BIT) in relation to computer graphics.(2 marks)

d) Discuss the purpose of Parallel projection methods used in creating 3-D sceneries (2 Marks)

e) Explain any two animation concepts. (2 Marks)

SECTION B

(*(Answer any THREE (3) questions in this section)*

Question Two (10 Marks)

Consider two raster systems with the resolutions of 1280 x 720 and 2048 x 1536.

i. Describe two ways of refreshing a display screen. (2 marks)

ii. How many pixels could be accessed per second in each of these systems by a display controller with a refresh rate of 120Hz? (2 marks)

iii) Film animators use a variety of methods for depicting and emphasizing motion sequences. Discuss three traditional animation techniques giving examples. (6 Marks)

Question Three (10 Marks)

a) Given a polygon with the vertices (0,0), (0,1), (1,0) and (1,1). Draw the shape obtained after transforming this unit square with the homogeneous matrix M given below. (5 Marks)

$$\mathbf{M} = \begin{pmatrix} 1 & 0 & 2 \\ 0 & 1 & -1 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} 3 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} \cos(90) & -\sin(90) & 0 \\ \sin(90) & \cos(90) & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

b) Rasterize a line having end points (10,20) and (16,25) and plot the resultant pixels using Bresenham's algorithm. (5 Marks)

Question Four (10 Marks)

a) Distinguish between the following terms
   i. Simulation and animation (2 marks)
   ii. Window port and view port (2 marks)
b) Given 3D geometric primitives explain how you would generate an image using the 3D rendering pipeline. (6 Marks)

Question Five (10 marks)

a) Explain any two principles of animation. (4 Marks)
b) Suppose you are given a scene to render through the graphics pipeline. Analyze Cartesian reference frames and procedure you would use to construct and display the scene. (6 marks)

Question Six (10 marks)

a) John wants to acquire a graphics display device, explain five factors he needs to consider in the acquisition process. (5 Marks)
b) Write a simple OpenGL program for rendering on a black background and red square. (5 marks)

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