

**PAN AFRICA CHRISTIAN UNIVERSITY
EXAMINATIONS PAPER**



EPAN AFRICA CHRISTIAN UNIVERSITY

BACHELOR OF BUSINESS INFORMATION TECHNOLOGY

END OF SEMESTER EXAMINATION

DEPARTMENT: COMPUTING AND INFORMATION TECHNOLOGY

COURSE CODE: BIT 400

COURSE TITLE: COMPUTER GRAPHICS

EXAM DATE: AUGUST, 2021

INSTRUCTIONS

- This exam script has **TWO (2)** sections.
- Read all questions carefully before attempting.
- Answer All questions in Section **A** and any other Three questions in Section **B**.
- Write only your **student number** on the answer booklet provided.
- None programmable calculator permitted
- Calculators on phones, tablets and computers are NOT permitted in Theory Papers

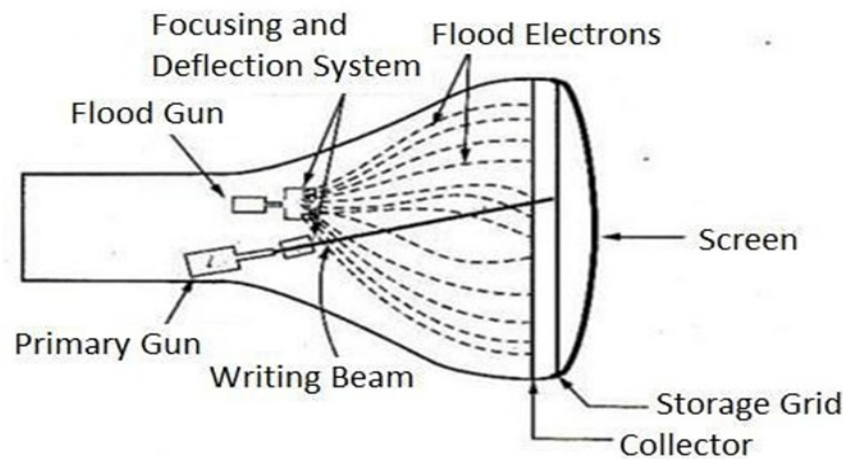
SECTION A

(Answer ALL questions in this section)

SECTION A

QUESTION ONE

- a) Imagine point $p(X, Y)$ is to be rotated about the origin by angle θ to location $p'(X', Y')$. Using diagram. Illustrate how it will rotate geometric. **[4 Marks]**
- b) Using suitable examples, outline **TWO** factors to consider when choosing 3D software **[2 marks]**
- c) Use the following diagram



- i) Explain how the diagram functions in relation to the screen image. **[2 Marks]**
- ii) Outline **TWO** advantages of Direct-view storage tubes. **[2 Marks]**

SECTION B

[Answer any THREE questions]

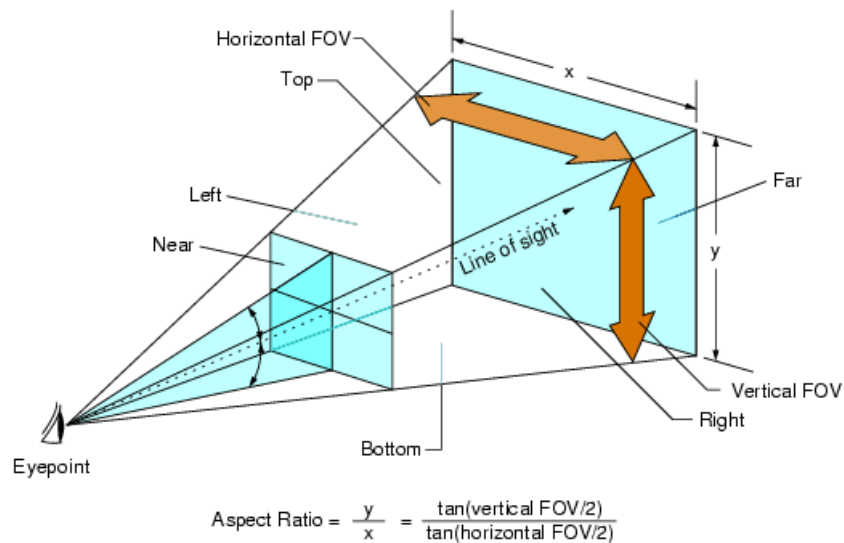
QUESTION TWO.

- a) Using illustrations, write components for a 2D translation that moves all points in an object along the same straight-line path to new positions. **[5 Marks]**

- b) Explain how a mirror image for 2D reflection is generated relative to an axis of reflection by rotating 180° . **[5 Marks]**

QUESTION THREE

- a) Use the diagram below to answer the questions.



- i) How do we determine the color of a piece of geometry? Explain **[3 Marks]**
- ii) Identify any **TWO** problems of 3D to 2D projection from above. **[4 Marks]**
- iii) Discuss critical issue when using clipping, and recommend solution to mitigate the same issue. **[3 Marks]**

QUESTION FOUR

- a) Imagine a point at position (x_w, y_w) in a designated window is mapped to viewport coordinates (x_v, y_v) , so that the relative positions in the two areas are the same. The figure illustrates the window to viewport mapping. A point at position (x_w, y_w) in the window is mapped into position (x_v, y_v) in the associated

viewport. Illustrate the same relative placement in viewport as in window.

[6 Marks]

c) Calculate the values of R, S and T of the line equation for each (K_P, J_P) and (K_R, J_R) .

Illustrate the linear equation for the values.

[4 Marks]

QUESTION FIVE

a) Using suitable examples, differentiate between random scan and vector scan

[5 Marks]

b) Consider the line from (3, 3) to (3, 4). Use the Bresenham's algorithm to rasterize this line.

[5 Marks]

QUESTION SIX

a) Using GIMP, highlight steps to be followed for design icon below.

[7 Marks]



b) Using above floating logo, explain how to fill new layer with some color to add some interest and plasma plumbing.

[3 Marks]