



**NATIONAL OPEN UNIVERSITY OF NIGERIA
DEPARTMENT OF COMPUTER SCIENCE
FACULTY OF SCIENCE
2020_1 EXAMINATION**

COURSE CODE: CIT 371
COURSE TITLE: INTRODUCTION TO COMPUTER GRAPHICS AND ANIMATION

CREDIT UNITS: 2

TIME ALLOWED: 2 HOURS

INSTRUCTIONS: ANSWER QUESTION 1 AND THREE (3) OTHER QUESTIONS

Question

- 1a) (i) Briefly describe graphics rendering pipeline process using relevant diagram (**3 marks**)
(ii) Explain the working principles of Cathode Ray Tube in graphics (**3 marks**)
- 1b) (i) Briefly describe The RGB Colour Cube using relevant diagram (**3 marks**)
(ii) Briefly explain the operational procedures of Greyscale Frame Buffer in image formation (**2 marks**)
- 1c) (i) What is the meaning of the forms of continuity: C^0 G^0 (**3 marks**)
(ii) Briefly describe the Basic ray casting algorithms in image formation (**2 marks**)
(iii) What are the pixel operations available in environment mapping (**2 marks**)
- 1d) (i) Differentiate between Orthogonal projection and Perspective projection (**2 marks**)
(ii) What do you understand by key-framing in 3D transform (**2 marks**)
- 2a) Explain the historical development of Computer graphics using the following years of invention (**6 marks**)
i) the age of Sutherland ii) the Early '60's iii) the '00's
- 2b) Write short notes on the following application of Computer Graphics:
(i) Medical Imaging (ii) Scientific Visualization (iii) Entertainment (**6 marks**)
- 3a Explain the working principles of Liquid Crystal Display (**6 marks**)
3b Differentiate between Traversing and Binary Space Partition tree (**6 marks**)
- 4a With the aid of relevant diagrams, show the following operations that can be performed on vectors:
(i) Vector Addition (ii) Vector Subtraction (**6 marks**)
- 4b) Write short notes on the following terms as used in vectors:
(i) Vector Scaling (ii) Vector Magnitude (**6 marks**)
- 5a Briefly explain the process of Vector Normalisation (**6 marks**)
- 5b Consider the matrix $A = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}$ and $B = \begin{bmatrix} b_{11} & b_{12} \\ b_{21} & b_{22} \end{bmatrix}$
Compute AB (**6 marks**)