National Open University of Nigeria, University Village Plot 91 Cadastral Zone,

### NnamdiAzikiwe Express Way, Jabi, Abuja

**Faculty of Sciences**

**JULY 2018 EXAMINATIONS**

CIT 371 - Introduction to Computer Graphics and Animations – (3 Credits)

 Answer Question 1 and four other questions in 21/2 Hours.

Total of 70, Question 1 is 22 marks and others 12 marks each

**1**a. What is Computer Graphics all about? (4 marks)

 b. Why do we want to build a hierarchical data structure such abounding boxhierarchy?(3 marks)

 c. List five graphic hard copy devices(4 marks)

d. State 3 industries with their possible curve continuity(3 marks)

e. What do you understand by Ray casting(3 marks)
f. Consider a rectangle whose corners are (1, 1), (3, 1), (3, 2) and (1,2) describe the transformations which would rotate this rectangleby 90oaround its centre(5 marks)

 (22 marks)

2a Describe the main difference between the following two approaches:

(i) construct a bounding volume hierarchy (e.g. bounding boxes orbounding spheres),

(ii) construct a hierarchy of splitting planes (e.g.KD trees or BSP trees).

(4 marks)

b. An alternative to the bounding box or bounding sphere hierarchy isto use splitting planes to divide space. Octrees, KD trees, and BSP treesare all splitting plane

(8 marks)

 (12 marks)

3a. Using linear systems, list and mathematically define 3 coordinate transformations.

 (8 marks)

 b. Define aliasing and antialiasing?(4 marks)

 (12 marks)

4a Briefly describe the basic graphics rendering pipeline(4 marks)

 b.What are the application areas of computer graphics?(8 marks)

 (12 marks)

5.a. Briefly describe the Basic ray casting algorithms that you know.(4 marks)

 b. What are the meanings of each of the following forms ofcontinuity:C0, C1,C∞

 (8 marks)

6a.Explain the process of mapping image coordinates to the viewport (4 marks)

 b. The table below summarizes the properties of the four primary types of printing ink. Fill the missing gap(8 marks)

|  |  |  |
| --- | --- | --- |
| **dye colour**  | **absorbs**  | **Reflects** |
| Cyan  | red  |  |
| Magenta  | green  |  |
| yellow  | blue |  |
| Black  | all  |  |

 (12 marks)