



**ELIZADE UNIVERSITY**

**ILARA-MOKIN**

**FACULTY: BASIC AND APPLIED SCIENCES**  
**DEPARTMENT: MATHEMATICS AND COMPUTER SCIENCE**  
**1<sup>st</sup> SEMESTER EXAMINATION**  
**2016 / 2017 ACADEMIC SESSION**

**COURSE CODE: CSC 427**

**COURSE TITLE: Computer Graphics and Visualization**

**COURSE LEADER: Dr. Festus Ayetiran**

**DURATION: 2 ½ Hours**

**HOD's SIGNATURE**

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**INSTRUCTION:**

The paper will contain SIX Questions. You should answer FOUR Questions.  
Answer Question **one** and any other **THREE** Questions.

Students are warned that possession of any unauthorized materials in an examination is a serious offence

1. (a) Using scene graph primitives, illustrate and implement the rendering of a car using depth-first traversal by applying the following materials; body, paint and tire materials comprising 4 wheels.  
(b) Explain the depth buffer (Z-buffer) algorithm for hidden surface removal. Buttress your point with pseudocodes. **(15 marks)**
2. (a) What is hidden surface removal?  
(b) State and explain two methods for solving hidden surface problems.  
(c) State three algorithms each for the methods in (b) above **(15 marks)**
3. (a) Using appropriate tool, illustrate the relationships which exist through the mixture of RGB colours and the resulting colours.  
(b) State the equations for these relationships  
(c) With the aid of appropriate comments to specify each colour, write the OpenGL commands for mixing the RGB colours and resulting colours they form using their coordinates. **(15 marks)**
4. (a) Explain the term rendering.  
(b) Explain the concept of image transformation. What are the usefulness?  
(c) With the aid of detailed underlying theoretical illustrations and formalisms (where applicable), explain four 2D transformations. **(15 marks)**
5. (a) Briefly explain the term pixel.  
(b) 3D projection is the core of many graphics application areas such as entertainment, games, computer aided design (CAD) etc. Why is it necessary? Briefly discuss.  
(c) Differentiate between parallel and perspective projections. **(15 marks)**
6. (a) Briefly discuss **FOUR** benefits of scene graphs  
(b) Discuss the tiled multidimensional arrays graphics data structure and offset calculation using one-level tiling for 2D arrays as example. **(15 marks)**