

ELIZADE UNIVERSITY ILARA-MOKIN

FACULTY: BASIC AND APPLIED SCIENCES

DEPARTMENT: MATHEMATICS AND COMPUTER SCIENCE

1st SEMESTER EXAMINATION

2016 / 2017 ACADEMIC SESSION

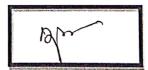
COURSE CODE: CSC 427

COURSE TITLE: Computer Graphics and Visualization

COURSE LEADER: Dr. Festus Ayetiran

DURATION: 2 ½ Hours

HOD's SIGNATURE



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)