



MACHAKOS UNIVERSITY

University Examinations for 2022/2023

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

THIRD YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SIT 343: COMPUTER GRAPHICAL SYSTEMS

DATE:

TIME:

INSTRUCTIONS

Answer Question ONE and other TWO Questions

QUESTION ONE (30 MARKS)

- Illustrate FOUR production stages of Computer graphics images (4 marks)
- Elaborate 'display of Information' with relevant instances as an area of application in Computer Graphics. (4 marks)
- Describe the role of Back-Face Culling also referred to as Back Face Algorithm in computer graphics. (4 marks)
- Elucidate THREE kinds of Lighting as implied in Computer graphics. (3 marks)
- Explain TWO fundamental ways of how the graphics system takes pixels from the frame buffer and displays them as points on the CRT (4 marks)
- By aid of a diagram elaborate the graphics pipelining. (5 marks)
- To get 2D pictures of a 3D world, you have to use projection. Elaborate TWO types of projections that may enable you realize 2D pictures of a 3D world. (6 marks)

QUESTION TWO (20 MARKS)

- Discuss TWO effect of Homogenous Coordinates in the realization of 2D pictures from a 3D world. (4 marks)
- Viewing in Computer Graphics requires THREE basic elements. Explain them. (6 marks)
- Describe TWO advantages of Back Face Algorithm. (4 marks)
- Elaborate the THREE steps of 3D Programming. (6 marks)

QUESTION THREE (20 MARKS)

- a) Discuss the **FOUR** types of transformation in computer Graphics. (4 marks)
- b) Describe the Objects and Viewers in any image-formation process as implied in computer graphics. (5 marks)
- c) Describe the “world space” in rendering as implied in computer graphics. (5 marks)
- d) Discus how OpenGL works from a programmer’s point of view. (6 marks)

QUESTION FOUR (20 MARKS)

- a) Elaborate the concept of occlusion testing in the context of Back Face Algorithm. (4 marks)
- b) Elaborate FIVE steps of the 3D Geometry Pipeline. (5 marks)
- c) Provide any TWO color model you are familiar with as implied in computer Graphics. (4 marks)
- d) Describe rasterization as used in Computer graphics. (3 marks)
- e) Write a simple program in Open Gl that represent a rectangle. (4 marks)

QUESTION FIVE (20 MARKS)

- a) Using a diagram, discuss Cathode Ray tube as an output device in computer Graphics. (5 marks)
- b) By help of a diagram, elaborate how the Shadow-mask CRT functions. (5 marks)
- c) Using a generic flat panel display, discuss any **THREE** flat-screen technologies as used in computer graphics. (3 marks)
- d) Illustrate the processing units in Computer graphics systems. (4 marks)
- e) Explain what you understand by triads as used in computer Graphic and 3D programming. (3 marks)