

UNIVERSITY EXAMINATIONS

SECOND SEMESTER, 2018/2019 ACADEMIC YEAR

EXAMINATION FOR BACHELOR OF SCIENCE IN COMPUTER SCIENCE
BACHELOR OF BUSINESS MANAGEMENT IN INFORMATION TECHNOLOGY
BACHELOR OF INFORMATION TECHNOLOGY

COMP 410/INTE 311: COMPUTER GRAPHICS

STREAM:CS Y4S1/IT Y3S1

TIME: 9.00-11.00AM

EXAMINATION SESSION: APRIL

YEAR: 4/04/2019

INSTRUCTIONS

- (i) **Question One is COMPULSORY.**
- (ii) **Attempt any other TWO Questions from the remaining section.**
- (iii) **Do not write on the question paper**
- (iv) **Show your working clearly**

SECTION A (30 MARKS)

QUESTION ONE (30 MARKS)

- a. Explain the concept of Computer Graphics in any two dimensions? (2 Marks)
- b. Differentiate between interactive computer graphics and non-interactive computer graphics while giving appropriate examples. (4 Marks)
- c. With an aid of a diagram, explain the FOUR components of an Interactive Graphics Display. (8 Marks)
- d. Explain the Mid-Point subdivision algorithm with the aid of a C-like program. (8 Marks)
- e. Holden wants to purchase Graphic input devices for his new digital photo studio. Explain how the following techniques can cover for the deficiencies of input.
 - i. Positional Techniques (2 Marks)
 - ii. Rubber Band Techniques (2 Marks)
 - iii. Dragging (2 Marks)
 - iv. Dimensional Techniques (2 Marks)

SECTION B :(40 MARKS)

QUESTION TWO (20 MARKS)

- a. With an aid of neat diagram, explain the basic design of a plasma panel display device (7 Marks)
- b. A Polygon is formed by the points A (3, 6), B (3, 15), C (9, 6), D (7, 4). Calculate the resulting points of the polygon when we do the following transformations on a two dimensional graphics screen. For each of the transformations below, plot the original shape and the resulting image.
 - i. Rotation about an arbitrary point P(12,15), 65^0 Anti-Clockwise (6 Marks)
 - ii. Scaling where the scaling factor is 3.5 and 5.5 along the X and Y axis respectively. (3 Marks)
 - iii. Translation 13 and 8 Pixels along the X and Y axis respectively (4 Marks)

QUESTION THREE (20 MARKS)

- a. Explain the concept of “Flat Panel Display”. (2 Marks)
- b. Name and discuss in detail the two Flat Panel Displays categories giving examples in each case. (6 Marks)
- c. List at least SIX interactive graphics devices for data input. (3 Marks)
- d. Explain the following into details giving appropriate examples in each case.
 - i) Raster Scans displays. (3 Marks)
 - ii) Random Scan displays. (3 Marks)
- e. Give an account on how computer graphics has improved the Education & Training sector with appropriate example (3 Marks)

QUESTION FOUR (20 MARKS)

- a) Explain the following concepts.
 - i. Persistence (3 Marks)
 - ii. DVST (3 Marks)
 - iii. Acoustic Tablet (2 Marks)
- b) Discuss the Bresenham algorithm with a relevant illustration. (4 Marks)
- c) Explain the four bit code that defines regions used in rejection method. (4 Marks)
- d) State and explain FIVE application areas of computer graphics. (4 Marks)

QUESTION FIVE (20 MARKS)

- a) With the aid of a well-illustrated algorithm, discuss the Digital Differential Analyser. (6 Marks)
- b) Write a brief note on the following Graphics Concepts
- i. Graphics Transformation (3 Marks)
 - ii. Matrix Representation of Points (3 Marks)
- c) Differentiate between bitmap and pixmap. (4 Marks)
- d) A polygon has 4 vertices located at A (20, 20), B (60, 10), C (60, 30), D (20, 30). Indicate a transformation matrix double the size of the polygon with point A located at the same place. (4 Marks)