

**UNIVERSITY**

**KABARAK**

**UNIVERSITY EXAMINATIONS**

**MAIN CAMPUS**

**THIRD SEMESTER, 2018/2019 ACADEMIC YEAR**

**EXAMINATION FOR BACHELOR OF SCIENCE IN COMPUTER SCIENCE**

**COMP 410/INTE 311: COMPUTER GRAPHICS**

**STREAM: BSC CS Y4S1/INTE Y3S1 TIME:** 2 HRS

**EXAMINATION SESSION: AUGUST YEAR:** 2018

**INSTRUCTIONS**

1. **Question One is COMPULSORY.**
2. **Attempt any other TWO Questions from the remaining section.**
3. **Do not write on the question paper**
4. **Show your working clearly**

**SECTION A (30 MARKS)**

**QUESTION ONE (30 MARKS)**

a) With the aid a diagram explain the DVST. **(6 Marks)**

1. Graphics systems are able to store and display images . With the aid of relevant illustrations, discuss how pictures are actually displayed on a CRT graphics system. **(6 Marks)**
2. Write a note on the following concepts.
   * 1. Frame Buffer **(2 Marks)**
     2. Persistence **(2 Marks)**
     3. Aspect Ratio **(2 Marks)**
3. On a CRT Screen, there are two particular techniques that are employed in drawing images on the screen. Differentiate between them with the help clear diagrams. **(4 Marks)**
4. Differentiate an **Emmisive** display from a **Non-emmisive** one**.(4 Marks)**
5. Differentiate between Image, Graphics and Pixel. **(4 Marks)**

**QUESTION TWO (20 MARKS)**

1. A Triangle formed by the points A(6,6), B(12,12), C(12,6). Calculate the resulting points of the triangle when we do the following transformations on a two dimensional graphics screen.
   * 1. Rotation about an abitrary point P(3,5), 300  AntiClockwise **(4 Marks)**
     2. Scaling where the scaling factor is 4.7. **(3 Marks)**
     3. Translation 12 and 7 Pixels along the X and Y axis respectively **(3 Marks)**
2. On a CRT monitor, two possible techniques can be employed todisplay colour discuss each in detail. Use relevant illustrations. **(4 Marks)**
3. Discuss the Digital Differential Analyser line drawing Algorithm with the aid of a well illustrated algorithm **(6 Marks)**

**QUESTION THREE (20 MARKS)**

1. Explain the sequence of operations on a point Q(x,y) to be moved through an angle **K** clockwise about a point (px, py). **(3 Marks)**
2. 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 and the resulting set of vertices. Show your work clearly. **(6 Marks)**
3. Discuss the two principal applications of image processing. **(4 Marks)**
4. DDA line drawing algorithm is popular for drawing lines on a graphics screen, explain any of its FOUR diadvantages. **(4 Marks)**
5. What are the various logical devices used for giving INPUT data to a Graphics System? **(3 Marks)**

**QUESTION FOUR (20 MARKS)**

1. Differentiate between Clipping and Windowing and explain siuations where each is suitable than the other. **(6 Marks)**
2. Explain the Midpoint Subdivision Algorithm with the aid of relevant illustrations. **(6 Marks)**
3. Explain the four bit code that defines regions on a Graphics Screen for purposes of identifying regions to be included or rejected for display. **(4 Marks)**
4. Discuss the following concepts. Use relevant illustrations where necessary.
   * 1. World coordinates **(2 Marks)**
     2. Device coordinates **(2 Marks)**

**QUESTION FIVE (20 MARKS)**

1. Otieno wants to purchase Graphic input devices for his new digital photo studio. Explain how the following techniques can cover for the deficiencies of input to graphic devices.
2. Basic Positioning Methods. **(3 Marks)**
3. Constraints. **(3 Marks)**
4. Grids. **(3 Marks)**
5. Rubber-Band Methods. **(3 Marks)**
6. Dragging. **(3 Marks)**
7. Painting and Drawing. **(3 Marks)**
8. Gravity Field. **(2 Marks)**