



Rajarata University of Sri Lanka
Faculty of Applied Sciences

Bachelor of Science (General) Degree
Second Year Semester I Examination – September/October 2013

COM 2304 - Computer Graphics and Image Processing

Answer all questions.

Time: 2 Hours

1.

- (a) Propose a hardware configuration for a Computer Graphics System and explain the reasons for selecting the particular configuration? (E.g.: Mouse – As a pointing device to input coordinate values.)
- (b) What is meant by Scan Conversion?
- (c) A high quality Raster-Graphics System has 12 bits per pixel in the frame buffer. It has three electron guns, one for each of the three primary colors: red, green, and blue. What is the minimum amount of voltage setting for an electronic gun in this graphics system?
- (d) Write a simple account on Graphics Software used in Computer Graphics.

(15 marks)

2. In present, Animation has a wide range of uses in different fields.

- (a) What do you mean by Animation?
- (b) The designing of an Animation Sequence follows few steps. What are those?
- (c) Suppose a ball, dropped from a height will bounce three times and assume this motion is subject to the gravitational force.
 - I. Design the animation sequence for the motion of the ball.
 - II. During the in-betweens creation, explain which interpolation you are going to use and why?
- (d) Give five applications of computer animation.

(20 marks)

3.

- Why Bresenham's line drawing algorithm effective than Digital Differential Analyzer (DDA) line drawing algorithm?
- Apply the DDA line drawing algorithm to draw the line between the points $(x_1, y_1) = (20, 10)$ and $(x_2, y_2) = (30, 18)$.
- At the designing of ellipse drawing algorithms, what are the parameters you have to consider?
- Following pixels are in an unfilled polygon and coordinate of the pixel P is (x, y) . If these pixels are going to fill with a color by using a 4-connected boundary-fill algorithm, what is the filling order of these pixels?

	P	

(30 marks)

4.

- What is meant by Image Enhancement?
- "Image Enhancement techniques are very much problem oriented". Explain this statement with a relevant example.
- What do you mean by Histogram of an image?
- Following figure shows some pixel in an image. Image gray scale level is 0 to 7. Equalize the histogram of this image.

2	4	2	4
0	1	3	2
1	2	4	3
3	2	3	4

(35 marks)