

2016

M.Sc. 1st Semester Examination

COMPUTER SCIENCE

PAPER—COS-104

Full Marks : 50

Time : 2 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

(Computer Graphics)

M1

[Marks : 25]

Answer any *two* questions.

1. (a) With a neat diagram, explain the working principle of LCD display system.
- (b) Compare and contrast Raster Scan display system and Random Scan display system. 5+5

(Turn Over)

2. (a) With a precise narrative description write the algorithm for Bresenham's circle generation.
- (b) It is desired to draw a line starting at A(3, 6) and ending at B(6, 2) on a graphics monitor. Use generalized Bresenham's algorithm to determine the pixel that would be put ON. 5+5
3. (a) The reflection about the line $y = x$ is equivalent to the reflection along x axis followed by counter clockwise rotation by θ degree. Find the value of θ .
- (b) Explain all the standards of 3D rotations. 4+6
4. (a) What is projection? Explain the different types of projection.
- (b) Prove that if rotation angle is θ the transformation matrix formed when multiplied by the transformation matrix formed when angle is $-\theta$ is equal to identity matrix, i.e.

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

(1+5)+4

Internal Assessment — 05

M2

[Marks : 25]

Answer any *four* questions.

1. (a) Explain the concept of sampling and quantization of an image. 1+1

(b) Explain

(i) False contouring

(ii) Checkers board effect.

$1\frac{1}{2} + 1\frac{1}{2}$

2. (a) What is the importance of image enhancement in image processing? 1

(b) For the given 4×4 image having grey scales between [0, 9], perform histogram equalization and draw the histogram of image before and after equalization.

$$\begin{bmatrix} 2 & 3 & 3 & 2 \\ 4 & 2 & 4 & 3 \\ 3 & 2 & 3 & 5 \\ 2 & 4 & 2 & 4 \end{bmatrix}$$

4

3. Explain the following with application :

(a) Contrast stretching ;

(b) Bit Plane Slicing.

$2\frac{1}{2} \times 2$

4. Explain the following filtering techniques :
- (a) Butterworth low pass filter ;
 - (b) Gaussian High pass filter. $2\frac{1}{2} \times 2$
5. Explain three Basic gray level transformation techniques. 5
6. Write short notes on dilation and erosion. $2\frac{1}{2} \times 2$

Internal Assessment — 05
