No. of Printed Pages—2

51 (CG)

[17–HDGKACRM–M3]

MCA/M.Sc IT 3rd Semester Exam., 2017

COMPUTER GRAPHICS

[MCA/M.Sc IT (S3) 12]

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Answer any *five* from the following questions : 2×5=10

(a) Define temporal and spatial redundancy.

(b) Define frame buffer.

(c) How is 2D rotation done?

(d) Give the homogeneous equation of a line.

(e) Give the names of three basic methods to generate characters in computer screen.

(f) Give the basic principle of reflection transformation.

2. Answer any *three* of the following questions : 4×3=12

(a) Give the differences between raster scan and random scan display system.

(b) Differentiate between parametric continuity and geometric continuity.

(c) Define scaling transformation. Give the condition for uniform scaling. Also give the matrix representation of scaling.

(d) Define virtual reality. Describe in brief the basic difference in the working of flood fill and boundary fill algorithm.

3. Answer any *three* from the following questions : 6×3=18

(a) List out the steps for reflection through an arbitrary line.

(b) Describe the process of constant shading in brief.

(c) What is the purpose of clipping procedure? Describe paint clipping in brief.

(d) Briefly describe the concept of antialiasing. When does an aliasing problem occur?

4. Answer any *four* from the following questions : 10×4=40

(a) A triangle has the vertices $A(0,0)$, $B(1,1)$ and $C(5,2)$.

(i) Magnify the triangle to twice its size while keeping $C(5,2)$ fixed.

(ii) Reflect the triangle about the line $y = x+2$ and $x = 2$. 5+5=10

(b) Describe the steps for transformation between coordinate systems. How can text clipping be achieved? 6+4=10

(c) Write short notes on any *two* of the following : 5×2=10

(i) Line drawing algorithms

(ii) Character generation

(iii) Usage of graphics

(d) Define shearing. Why are 3D transformations used? Differentiate between rotation between *X*-axis and *Y*-axis. 2+2+6=10

(e) Can a spline curve be fitted to any number of control points? What is a convex hull? Briefly describe the process of translation. 1+2+7=10

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