53 (IT 602) CGRM

2014

COMPUTER GRAPHICS AND MULTIMEDIA

Paper : IT 602

Full Marks : 100

Pass Marks : 30

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. *(a)* Compare Raster and Random Scan Displays. 10

(b) Compute the points on a circle with radius $r = 10$ and center at (4, 3) using Midpoint Circle Algorithm. 10

2. *(a)* State the role of following functions in an OpenGL program — 1×5=5

(i) glutReshapeFunC

(ii) gluOrtho2D

(iii) glutMainLoop

(iv) glClear

(v) glBitmap

(b) Why <glut.h> header file is included in an OPenGL program ? What is an "OpenGL Display Callback Function" ? What is world co-ordinate reference frame ? 2+2+1=5

(c) Explain the difference between the OpenGL Core Library (GL), the OpenGL Utility (GLU), and the OpenGL Utility Toolkit (GLUT). 5

(d) Explain with diagram different OpenGL polyline functions. 5

3. *(a)* Assuming that a certain full color (24 bit per pixel) RGB raster system has a 512 by 512 frame buffer, how many distinct colour choices (intensity levels) would be available ? How many different colours would be displayed at any one time ? 2+2=4

(b) Define Vertical Retrace, Horizontal Retrace and Refresh Buffer. 2×3=6

(c) How coloured picture can be generated on a CRT Monitor ? Describe *any two* techniques with diagram. 5+5=10

4. (a) Determine the form of two dimensional rotation matrix for a reflection about any line $y = mx + b$. 5

(b) Determine a sequence of basic transformations that is equivalent to the X-direction shearing matrix. 10

(c) How can we transfer a 3D object from one co-ordinate system to another ? 5

5. (a) Describe three dimensional viewing transformation pipeline with a diagram. 10

(b) Explain Cohen-Sutherland line clipping algorithm with a diagram. 10

6. Write short notes on ***any two*** of the following : $2 \times 10 = 20$

(a) Input Devices

(b) Computer Graphics Applications

(c) Visible Surface Detection

(d) Raster Method for Computer Animation.
