

ANNA UNIVERSITY : CHENNAI – 600 025
MCA DEGREE EXAMINATIONS OCT/NOV 2012

MC 9237-GRAPHICS LAB

MASTER OF COMPUTER APPLICATION

Regulations 2009

Time: 3 Hours

Maximum Marks: 100

PART A (Graphics programming)

- 1 Write a program to create a square and apply the following transformations in the same order specified. 100
- Scaling by a value of 2 in both the axes
- Translation by a value of 2 in both the axes
- Rotation by 30 degrees about x axis.
- Apply all the transformations with respect to the centre of the square.
- 2 A polygon has four vertices A(20,10) B(60,10) C (60,30) and D(20,30).Write a program to double the size of the polygon with point A located at the same location. 100
- 3 The following transformation matrix would reflect a point about the diagonal line passing through the origin and (10,10)line. 100
- $$\begin{matrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{matrix}$$
- Show that this is same as the complex transformation of 45 degrees clockwise rotation, followed by reflection about the x axis and finally by rotation of 45 degrees anticlockwise rotation (about origin). Write a program to plot a point and apply the above two sets of transformations and prove them to be the same visually.
- 4 Write a program to find the reflected view of a triangle with vertices A(30,40) B(50,50) C(40,70) about a mirror which is vertically placed such that it passes through (20,0) and (0,20). 100

- 5 Write a program to draw a circle using mid point circle drawing algorithm centered at (5,5) and having a radius of 5 units. Fill the circle using boundary fill algorithm. 100
- 6 Write a program to rotate a cube with coordinates A(30,15,30) B(45,15,30) C(45,15,15) D(30,15,15) E(30,30,30) F(45,30,30) G(45,30,15) and H(30,30,15) about its diagonal pointing away from the origin by 30 degrees. 100
- 7 Write a program to generate a bi cubic B Spline surface of 5x6 polygon net. Calculate 50 parametric points in each parametric direction and join them to form a wire frame with rectangular grid. 100
- 8 Write a program to generate a sphere and apply rotation of the sphere by 30 degrees along all the three axes. 100
- 9 Write a program to generate a cuboid and apply the following transformations as composite transformation. 100
- Scaling by a factor of (2,2,1)
- Translation by a factor of (5,5,5)
- And reflection about x axis.
- 10 Write a program to generate a cone and scale the cone by a factor of (2,2,2) about the vertex of the cone. 100
- 11 A tetrahedron is given by position vectors A(2,2,-1) B(4,2,-1) C(3,2,-3) and D(3,4,-2). Write a program using depth buffer method to find the visible planes of the tetrahedron if the viewing plane is xy plane i.e z=0. 100
- 12 Write a program to apply hidden surface removal over a cube having different colours on all the faces using Z buffer algorithm. 100
- 13 Write a program using back face detection method to colour the back faces of a tetrahedron into black which is placed in the centre of the screen. 100
- 14 Write a program to draw a tetrahedron given by points A(1,1,1) B(3,1,1) C(2,1,3) and D(2,2,2) and a point light source is kept at P(2,3,4). Using back face detection algorithm find the surfaces on which light falls and the surfaces which are to be shadowed. 100
- 15 Write a program to draw a tetrahedron given by points A(1,1,1) B(3,1,1) C(2,1,3) and D(2,2,2) and a parallel beam of light source is given by $-(i+5j+6k)$ that falls on tetrahedron. Using back face detection algorithm find 100

the surfaces on which light falls and the surfaces which are to be shadowed.

PART B (Photo editing tool)

Use any photo editing tool for the below questions.

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| 1 | Given a grey scale image colourize the image. | 100 |
| 2 | Create a waving India flag as an animated Gif file. | 100 |
| 3 | Create a scenery using layers and apply filters to the scene. | 100 |
| 4 | Design a greeting card for your friend's birthday. | 100 |
| 5 | Design a book cover by applying special effects. | 100 |
| 6 | Merge more than two pictures and create a meaningful poster. | 100 |
| 7 | Take a face of an youth and change it to an aged man. | 100 |
| 8 | Apply text effects and create a logo for your college cultural. | 100 |
| 9 | Apply water rippling effect to a standstill water picture. | 100 |
| 10 | Apply snowy effect and create a ice snow scene. | 100 |