Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY, MANIPAL 576104

(Constituent College of Manipal University)

FOURTH SEMESTER B.TECH. DEGREE MAKEUP EXAMINATION, JULY – 2016
SUBJECT: OPEN ELECTIVE 1 - COMPUTER GRAPHICS AND ANIMATION – ICT 342

TIME: 3 HOURS **09/07/2016** **MAX. MARKS: 50**

Instructions to candidates
Answer any **FIVE** full questions.
Missing data, if any, may be suitably assumed.

1. A. What is RGB colour model? How many different colours are possible for the following?
(i) 1 bit for R, G and B each
(ii) 8 bits for R, G and B each
Also compute the size of the frame buffer for each of them for a 1024 x 1080 display.
What is the use of lookup table and shadow mask?

B. Define fluorescence and phosphorescence. Explain the working of raster display devices.

C. What are the types of the CRT display devices?

[5+3+2]

2. A. Find the points selected by Gupta-Sproull algorithm for drawing a line between (5, 3) and (9, 6). Show all intermediate processing steps.

B. Write pseudo code for midpoint circle drawing algorithm using the second order differences.

C. Write the pseudo code for midpoint line drawing algorithm.

[5+3+2]

3. A. Apply the following transformation on a cube of size 1 unit. Assume that one of its vertex coordinate is [0, 0, 0] which is at the origin initially. Also give the composite transformation matrix.

(i) Move by a distance 5 from origin
(ii) Rotate by 30 degree (for the cube about z axis)
(iii) Reflect with respect to yz plane for cube
(iv) Reduce the size by 1/8
(v) Modify x by twice the value of y

B. Draw a circle of radius 10 using the first order difference version of midpoint circle drawing algorithm.

C. What are jaggies? How to reduce it?

[5+3+2]

4. A. What are key frame systems? For a film which has 36 frames per second and the display refresh rate is 65 Hz, how many key frames are required if the number of in-between frames is 8?
What are the general procedures for morphing? Explain each of them with an example.

B. Compare oblique and orthographic projection with an example. Also mention the differences and similarities of oblique and orthographic projection.

C. Write the 2D transformation for 30 degree rotation followed by a scaling to double the size.

[5+3+2]

5. A. Write an OPENGL program to perform the following:
(i) Rotate a cube on mouse click
(ii) Draw a teapot, sphere and cube

B. What is event driven programming? Explain the structure of an OPENGL program.

C. What is OPENGL? What are its major abstractions?

[5+3+2]

6. A. For the following figure (**Fig.6.A**) explain how Cohen-Sutherland line clipping works for lines L1, L2, L3 and L4. The clip rectangle is bounded by lines x = xmin, x = xmax , y = ymin and y = ymax.

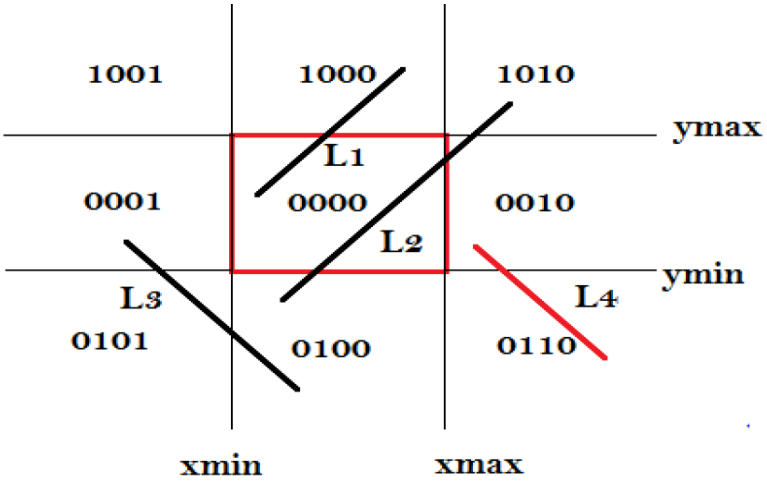

Fig.6A

B. Write pseudo code for DDA line drawing algorithm.

C. Is 3D rotation commutative? Justify your answer.

[5+3+2]