C1-R4: ADVANCED COMPUTER GRAPHICS

NOTE:

1.	**Answer question 1 and any FOUR from questions 2 to 7.**
2.	**Parts of the same question should be answered together and in the same sequence.**

Time: 3 Hours **Total Marks: 100**

1.
a) How long would it take to load 640x480 frame buffers with 12 bit per pixel if 10^5 bits are transferred per second?
b) Create a matrix that rotates a points 90 degrees about the point (1,1).
c) What is Cubic Bezier Curve? Mention its use in computer graphics.
d) Explain Warn Model.
e) Give color conversion between following models:
   i) RGB to CMY
   ii) RGB TO YIQ
f) Discriminate Plasma Panel Display and LCD Display.
g) Describe constant shading

(7x4)

2.
a) i) How the white light emitted from sunlight is different from white light emitted by computer System?
   ii) Compare HSV and HSL Color model.
b) Prove that parallel lines in the world do not always appear as parallel lines with perspective projection.
c) In spatial-partitioning representations, a solid is decomposed into a collection of adjoining, nonintersecting solids that are more primitive than the original solid. Explain Cell Decomposition Method.

(6+4+8)

3.
a) Find the scaling transformation matrix to scale by sx, sy and sz units with respect to fixed point p(x,y,z).
b) Describe Liang and Barsky Line Clipping Algorithm.
c) Explain Z-buffer algorithm. What are the advantages and disadvantages of the z-buffer algorithm?

(6+6+6)

4.
a) A square with vertices (0,0), (2,0), (0,2) and (2,2) is rotated by an angle 45 degree anticlockwise about point (2,2) Determine co-ordinates of the vertices after rotation. Will the figure remain square after rotation?
b) What steps are required to fill a region using the boundary-fill method?
c) Compare Object Space Method and Image Space Method for Visible Surface Detection. What are various algorithms used for Object Space Method and Image Space Method?

(6+4+8)

5.

a) Suppose you had a monitor that emitted light that was either Cyan, Magenta or Yellow. How could you use this to create white light?

b) Define coherence. Explain the various types of coherence used in Visible surface Determination.
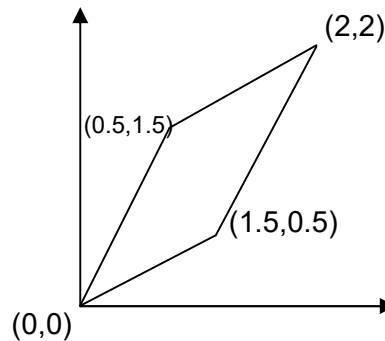
c) Write a short note on: Bump Mapping.

(3+9+6)

6.

a) Prove that in a Cubic Bezier Curve, curve will always tough first and last control points.

b) A square as shown in (a) is converted to a parallelogram as in (b) using composite transformation matrix M. Determine such matrix.
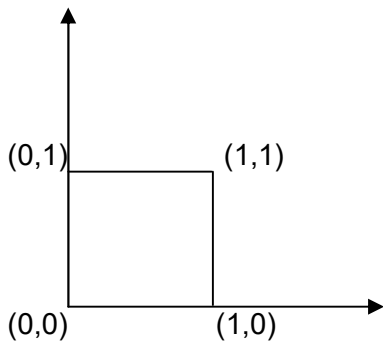
| (a) | (b) |

(9+9)

7.

a) What are the ways to generated computer animation? You get moving images when pictures change in some way. What are the ways in pictures can change?

b) Find out the pixel location approximating second octant of a circle having centre at C(0,0) and radius 8 using the mid-point subdivision method.

c) Describe any Computer Animation Languages.

(6+8+4)