

Total number of printed pages : 4

MCA
PCS 3007

Fourth Semester Examination – 2006

COMPUTER GRAPHICS

Full Marks : 70

Time : 3 Hours

Answer Question No. 1 which is compulsory and any five from the rest.

The figures in the right-hand margin indicate marks for the questions.

1. Answer the following questions : 2×10

(a) Draw a diagram of a CRT and label its five major components.

(b) What are the difference between raster-scan CRT and Random-access CRTs ?

P.T.O.

- (e) What is meant by refreshing of the screen ?
- (d) Explain the merits and demerits of DVST.
- (c) Determine the memory buffer requirement for a computer which must display an image in 8 possible colors with a resolution of 800×600 pixels.
- (f) Define and differentiate between windowing and view ports.
- (g) What do you mean by BITBLT transformations ?
- (h) What steps are required to scan-convert an arc using the trigonometric method ?
- (i) How data are transmitted in multimedia system ?
- (j) Give two reasons why homogeneous coordinates are more useful in computer graphics than Cartesian coordinates.
2. (a) State the Bresenham's raster line drawing Algorithm. Generate the pixels addresses for a line with endpoints (20,10) and (30,18) with slope of 0.8 and $\Delta x = 10$, $\Delta y = 8$. 5
- (b) Define an Oblique projection and an isometric projection. Describe the steps to construct a canonical view volume from a perspective view volume. 5

3. (a) State and explain midpoint circle generation algorithm for raster scan device. 5
- (b) Construct 4×4 matrices, which achieve the following transformations : 5
- (i) Scale by 0.5 in the x-coordinate direction, 2.6 in the y direction and 0.7 in the z direction
- (ii) Rotate by +45 degrees about the z-axis
- (iii) Translate by a vector (0,0, -5.0, 8.0).
- (a) What steps are required to scan convert a sector using the trigonometric method ? 5
- (b) Discuss the mechanism used in raster-scan display processor. What is the difference between a point and the Open GL primitive, GL_POINTS ? 5
- (a) Compare and contrast the advantages and disadvantages of Cohen-Sutherland clipping algorithm and the pixel-based line-clipping algorithm. 5
- (b) Describe the architecture and major components of distributed multimedia system. 5

6. ✓ (a) A 2D translation is specified by $t_x = -1.0$ and $t_y = 2.0$. If the translation is applied to the point $(2.0, 3.5)$, what are the coordinates of the resulting point? Express the result both as an ordinary 2D coordinate and as a homogeneous coordinate. 5

✓ (b) What are the different requirements of Multimedia operating system to meet the real time requirements? 5

7. ✓ (a) Describe how multimedia technology is applied in different fields. What is multimedia system? Describe the components of multimedia systems and its applications. 5

✓ (b) OpenGL imposes restrictions on primitive polygons (GL_POLYGON). What are those restrictions? Why are they necessary? 5

8. ✓ (a) Describe the different steps of JPEG compression? Explain Why DCT is based on an 8×8 or a 16×16 matrix? How would motion JPEG differ from MPEG? 5

✓ (b) What do you mean by emissive and non-emissive displays? What steps are required to plot dashed line? 5

99-7861431