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	MANIPAL INSTITUTE OF TECHNOLOGY (Constituent Institute of Manipal University) MANIPAL-576104	
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FIFTH SEMESTER B.E (CSE) DEGREE EXAMINATION
 November/December 2010
COMPUTER GRAPHICS & MULTIMEDIA (CSE 305)
 (REVISED CREDIT SYSTEM)

TIME : 3 HOURS

MAX.MARKS : 50

Instruction to Candidates

- Answer **any five** full questions

- 1A. Derive the necessary decision parameters to draw a line of slope positive and greater than one using Bresenham's method. [4]
- 1B. Use the digital differential analyzer line drawing technique to rasterize a line from (-12, 10) to (-6, 15). [3]
- 1C. With reference to scan line polygon filling technique, explain the following.
 - (i) Concept of coherence.
 - (ii) Odd/Even parity rule.
 - (iii) Rule for filling shared vertices.
 - (iv) Rule for filling horizontal edges.
 - (v) Rule for fraction intersection of x at left and right edges.
 - (vi) Need for global edge table. [3]
- 2A. Use Liang Barsky method to clip a line whose co-ordinates are (-1, 7) and (11, 1). Given the clip rectangle co-ordinates as (1, 2) and (9, 8). [3]
- 2B. Suppose we have a video monitor with display area that measures 12 inch across and 9.6 inch high. If the resolution is 1280×1024 and aspect ratio is one, what is the diameter of each screen point (pixel)? Also, how much time is spent scanning across a single row of pixels during the screen refresh on a raster system with screen resolution 1280×1024 and refresh rate of 60 frames/second. [2]
- 2C. With a neat diagram explain the working of monochrome CRT. [5]

- 3A. A window is defined by an ellipse with 5 units semi-major axis and 3 units semi-minor axis with center at (1, 1). A circle of radius 1/2 and center (1/2, 1/2) is used as a viewport. Find the window to viewport transformation matrix. **[3]**
- 3B. Triangle A(4,0), B(4,4), C(2,2) and a circle of radius 8 units and center (10,10) are defined in XY plane. **[5]**
- Obtain the composite 2D transformation matrix to fit the triangle ABC inside the circle such that, edge AB is horizontal and passing through the center of the circle and the vertices A, B and C touches the edge of a circle.
 - Also obtain the final transformed co-ordinates of the triangle ABC.
- 3C. Describe any four properties of curves. **[2]**
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- 4A. A CRT is capable of generating 6 intensities in the range $[I_0, 1]$. If the initial intensity, I_0 is 0.25, find the other intensities values. **[2]**
- 4B. Derive the blending functions of Bezier curve with four control points. **[3]**
- 4C. Give any two instances where image space algorithms are preferred over object space algorithms for hidden surface removal. Also, discuss the four cases of area subdivision method. **[5]**
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- 5A. Given a unit cube with one corner at (0, 0, 0) and opposite corner at (1, 1, 1). Derive the composite transformation necessary to rotate cube by 30 degrees about main diagonal [from (0, 0, 0) to (1, 1, 1)] in the clockwise direction when looking along diagonal towards origin. **[5]**
- 5B. With proper illustration, explain the uses of CIE chromaticity diagram for:
- Determining dominant wavelength and purity of a given colour.
 - Identifying complementary colours.
 - Comparing colour gamuts for different sets of primaries. **[3]**
- 5C. With appropriate explanation give any four differences between parallel and perspective projections. **[2]**
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- 6A. Explain the basic rules of animation. **[3]**
- 6B. Describe the following building blocks of multimedia system.
- Hypertext and Hypermedia
 - MIDI **[3+4]**
