



Printed Pages : 3

CS – 603

(Following Paper ID and Roll No. to be filled in your Answer Book)

**PAPER ID : 1037**

Roll No.

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### B. Tech.

(SEM. VI) EXAMINATION, 2006-07

### COMPUTER GRAPHICS

*Time : 3 Hours]*

*[Total Marks : 100*

**1** Attempt any **two** : **2×5=10**

- (a) Distinguish between Raster and Vector graphics methods. When do we prefer ? What?
- (b) Describe briefly Bresenham's circle drawing algorithm. Why do we prefer incremental algorithm over DDA ?
- (c) How do we represent polygon using polygon table, edge table and vertex table explain with an example.

**2** Attempt any **two** : **2×5=10**

- (a) Distinguish between window port and viewport. In 2D clipping how are lines grouped into visible, invisible and partially visible categories?
- (b) Give a 3x3 homogeneous matrix to rotate the image clockwise by 90°. Then shift the image to the right by 10 units. Finally scale the image by twice as large. All these transformations are to be done one after another in sequence.

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- (c) What is a segment table. How do we create it ?  
Why do we need segments ? Explain in detail.

**3** Attempt any **two** : **2×5=10**

- (a) A cube is placed at the origin of 3D system. Such that all its vertices have positive coordinate values and sides are parallel to the three principal axes. Indicate a convenient position of a viewer at which he can see a 2-point perspective projection. Verify that such a view is generated.
- (b) Define vanishing points. Is the location of vanishing point directly related to the viewing point? Explain how ?
- (c) What are the various logical graphic input primitives. What are the various input modes in which they work ?

**4** Attempt any **two** : **2×5=10**

- (a) What is ray tracing algorithm for hidden surface removal ? Explain mathematically how do we find which planes are visible using ray tracing algorithm.
- (b) What are the two spaces in which hidden surface algorithms work ? How does sorting and coherence speed up calculation in such algorithms ?
- (c) Given control points (10,100), (50,100), (70,120) and (100,150). Calculate coordinates of any four points lying on the corresponding Beizer curve.

**5** Attempt any **two** : **2×5=10**

- (a) Derive simple illumination model. Include the contribution of Diffuse, ambient and specular reflection.
  - (b) How are periodic B-spline curves different from non-periodic B-spline curves?
  - (c) Which clipping algorithm is best suited for hardware implementation? Give how this algorithm works.
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