END TERM EXAMINATION

FIFTH SEMESTER [BCA] DECEMBER 2016

Paper Code: BCA-303	**Subject: Computer Graphics**
Time: 3 Hours	**Maximum Marks: 75**

Note: Attempt any five questions including Q.no.1 which is compulsory. Select one question from each Unit.

Q1   Answer the following questions: **(2.5x10=25)**
(a) What is the function of a CRT?
(b) Give two differences between random scan and raster scan display system.
(c) Define the terms Bit map, pixel map and resolution.
(d) What is interlacing?
(e) Specify first order parametric continuity condition for two curves?
(f) Give a chart classifying the various projections.
(g) List various input devices used in interactive graphics.
(h) Consider a raster system with resolution of 1280 x 1024. What sizes of frame buffer (in bytes) are needed for the system to store 24 bits per pixel and 12 bits per pixel respectively?
(i) What is an Octree?
(j) Mention two advantages of LCD displays over Plasma displays.

Unit-I

Q2   (a) Describe Bresenham's circle drawing algorithm. Draw a quadrant of a circle of radius 6 with center (1, 3) giving all steps.   **(7.5)**
(b) Using Bresenham's line drawing algorithm find out the list of the activated pixels for the line from (5, 5) to (13, 9).   **(5)**

Q3   (a) Given a clipping window A(20, 20), B (60, 20), C(60, 40), D(20, 40). Using Sutherland Cohen algorithm find the visible portion of the line segment joining the points P(40, 80) and Q(120, 30).   **(6)**
(b) Discuss the advantages of interactive graphics? Give a classification of applications where interactive graphics are used.   **(6.5)**

Unit-II

Q4   What is the significance of homogenous coordinate system in graphic? Give 3D transformation matrices for rotation in homogeneous coordinate system. Magnify the triangle with vertices. A(0, 0), B(1, 1), C(5, 2) to twice its size keeping C(5, 2) fixed.   **(12.5)**

Q5   (a) A triangle is defined by vertices A(2,2), B(4,2), C(4,4). Find the transformed coordinates of the triangle after rotation about origin through 90^0 followed by reflection about the line y = - x.   **(6)**
(b) Discuss steps and give matrix to transform an object from window to viewport.   **(6.5)**

Unit-III

Q6   Give the properties of Bezier curve. Find all the blending functions and drive Bezier matrix for a cubic Bezier curve. Hence find the equation of a Bezier curve given the control points as $P_0(40,40)$, $P_1(10,40)$, $P_2(10,60)$, $P_3(60,0)$ and draw a rough sketch of the curve.   **(12.5)**

Q7   (a) What are B spline curves? Describe the various types of B splines.   **(6)**
(b) What are spatial partitioning representation and boundary representations? **(6.5)**

Unit-IV

Q8   (a) Discuss the various types of parallel projections.   **(7.5)**
(b) Find the projection of a unit cube using Cabinet projection with θ = 30⁰. **(5)**

Q9   (a) Explain Z-Buffer Method for hidden surface removal with an example. **(6.5)**
(b) Explain Cohen Sutherland clipping algorithm for 3D clipping.   **(6)**

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