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B.Tech
PCCS4401

7th Semester Regular / Back Examination 2016-17
COMPUTER GRAPHICS
BRANCH(S): AEIE, BIOMED, ECE, EIE, ETC, FASHION, FAT, IEE, IT, ITE, TEXTILE
Time: 3 Hours
Max Marks: 70
Q.CODE: Y195
Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 **Answer the following questions:**   **(2 x 10)**
   a) Find the width of an image having height of 5 inches and an aspect ratio 1.5.
   b) Differentiate a Bitmap and a Pixel map.
   c) Give the transformation for 2D reflection along x axis and using it transform a triangle with vertices (1,0), (5,0) and (2,3).
   d) Differentiate dithering and halftoning.
   e) Give the matrix format of a window-to-viewport transformation.
   f) What are the advantages of B spline over Bezier curve?
   g) What is the knot vector in a B-spline curve? Why it is required?
   h) What is a Random Fractal? Give an example and explain its construction.
   i) Write the difference between flood fill and boundary fill algorithm.
   j) Differentiate between Virtual Reality and Augmented Reality.

Q2 What is raster refresh graphics display? Explain the display of a color image through raster CRT. Use the 24 bit plane colour frame buffer for this purpose with 10 bit wide lookup table. Explain the entire process.   **(2+8)**

Q3 **a)** Describe homogeneous transformations using matrix notation for three basic transformations viz translation, rotation and scaling.   **(3)**

   b) The position vectors [2 4 1], [4 6 1] and [2 6 1] describes the vertices o the triangle ABC. A line L [y=1/2(x+4)] passes through the origin by translating it -2 units in the y direction. Make a reflection of the triangle about the line L.   **(7)**

Q4 Proof that three-dimensional rotations are non-commutative. Also, **(10)** using an example show that the statement is correct.

Q5 **a)** What do you mean by perspective projection? Perform a perspective **(5)** projection onto the z=0 plane from the center of projection at zc = -2. Give the perspective transformation of AB to A'B' with r = 0.5.

b) Give an example of two-point perspective projection. **(5)**

Q6 Give the characteristics of a Bezier curve. Draw the Bezier curve using **(10)** the vertices (1,1), (2,3), (4,3), (3,1). Determine the seven points on the Bezier curve.

Q7 What is Surface Rendering Method? Mention the different types of **(2+3+5)** Polygon Rendering methods in graphics. Explain Painters algorithm using example.

Q8 **Write shorts on any two of the following:** **(5 x 2)**
a) Scan line Algorithm.
b) Deterministic fractals
c) Depth buffer algorithm
d) Input output virtual reality devices