BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

01573

Term-End Examination

December, 2012

BME-002 : COMPUTER AIDED DESIGN

Time : 3 hours   Maximum Marks : 70

Note :   Attempt **any seven** questions. Use of calculator is allowed. Drawing of the diagram is **compulsory**. Wherever instructed in the numerical question.

1.   What is the function of digital to analog   **10**
     converter ? What do you understand by the term
     "aliasing" or jaggies ? What do you understand
     by the term line drawing device ? Give examples
     and support your answer with diagram.

2.   Briefly explain with the help of example and   **10**
     drawing atleast **one** of the following :

     (a)   Locator device

     (b)   Pick device

3. A unit square is transformed by a 2×2 **10** transformation matrix. The resulting position vectors are

$$\begin{bmatrix} 0 & 0 \\ 2 & 3 \\ 8 & 4 \\ 6 & 1 \end{bmatrix}$$

What was the transformation matrix ?

4. Scale the triangle with position vertices $x(0, 0)$, **10** $y(2, 2)$ and $z(5, 0)$ to double its size.

5. Write down the general transformation matrix for **10** a three point perspective transformation and explain with help of a diagram to show the various points like centre of projection, vanishing point etc.

6. Write an Algorithm for Back Face Detection **10** Method. Support your answer with the help of diagrams.

7. Explain in Brief. "Diffuse Illumination". Support **10** your answer with the help of diagram.

8. For the position vectors $P_1[2 \ 4]$ and $P_2[8 \ 6]$, **10** determine the parametric representation of the line segment between them. Also determine the slope and tangent vector of the line segment.

9. Calculate the mid-point of Hermit Cubic Curve 10
defined by the following points

$V_0 = [1, 2]$ $V_0'(0) = [0, 4]$

$V_1(1) = [8, 10]$ $V_1' = [4, 0]$

10. Fit a Bezier curve with the following control 10
points.

P_0 (1, 1) P_1 (2, 2) P_2 (3, 1) and P_3 (4, 0)

————