BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

Term-End Examination

June, 2011

BME-002 : COMPUTER AIDED DESIGN

Time : 3 hours   *Maximum Marks : 70*

Note :   *Attempt **any seven** questions. Use of calculator is allowed.*
          Draw neat sketches wherever instructed to support your
          answer in theory and numerical questions.

1.   (a)   With the help of a neat sketch explain the   5
           function of frame buffer.

     (b)   List the different types of input devices with   5
           the help of neat sketches explain functioning
           of any two devices.

2.   Give brief write up on any four types of output   10
     devices

3.   (a)   Consider a line AB whose position vectors   5
           of end points are
           $[A] = [1, 2]$ $[B] = [3, 4]$
           The translations in x and y directions
           $[T_x, T_y] = [2, 3]$

Calculate the end points of the translated line. Draw neat sketches of the original line and translated line.

(b) Define the following terms with the help of neat sketches.

(i) Reflections

(ii) Scaling

4. With the help of neat sketch explain the HSV colour Model. 1

5. (a) Why parametric representation of curves is better compared to analytic representation ?

(b) Fit a Bezier curve having the following control points : P_0 (1, 1) P_1 (3, 6) P_2 (5, 7) and P_3 (7, 4) find out a point at t = 0.4

6. Develop the equation of a Bezier curve, find the 1 points on the curve for t = 0, ½, 1 and plot the curve for the following data. The Coordinates of the four control points given by

V_0 = [0,0,0] ; V_1 = [0,2,0] ; V_2 = [4,2,0] ;

V_3 = [4,0,0]

7. Expand the given cubic Bezier surface equation 1 for n = 3 and m = 3

$$P(u, v) = \sum_{i=0}^{3} \sum_{j=0}^{3} P_{ij} \, B_{i,3}(u) \, B_{j,3}(v) \, ;$$

$0 \le u \le 1, 0 \le v \le 1,$

and also represent in a matrix form.

8. What do you understand by regularised Boolean **10**
    operations ? Give brief explanation and its use of
    application.

9. Discuss the Salient features of STEP that are **10**
    applicable for transfer of manufacturing data
    bases.

10. Give a brief History of IGES and its applications. **10**

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