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7E4060

Roll No. : _____

Total Printed Pages : 3

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B. Tech. (Sem. VII) (Main/Back) Examination, December-2012
Mechanical Engineering
7ME1 Computer Aided Design (Common for 7PI6.3)

Time : 3 Hours]

[Maximum Marks : 80
[Min. Passing Marks : 24

*Attempt any five questions. Selecting one question from each unit.
All questions carry equal marks. Schematic diagrams must be
shown wherever necessary. Any data you feel missing suitably
be assumed and stated clearly. Units of quantities used /
calculated must be stated clearly.*

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. _____ Nil _____

2. _____ Nil _____

UNIT - I

1 (a) Explain with neat diagram : Refresh Display, DVST and Raster Display.

10

(b) Illustrate DDA algorithm for line with end points $P_1(18,8)$ & $P_2(25,15)$, calculate at least eight points for this line.

6

OR

1 Explain in detail Bresenham's Circle algorithm and plot pixel values of circle for radius $R = 10$.

UNIT - II

2 (a) What are the merits and demerits of wire frame modeling?

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1

[Contd...

- (b) The coordinates of four control points relative to a current WCS are given as :

$P_0 = [2 \ 2 \ 0]^T$, $P_1 = [2 \ 3 \ 0]^T$, $P_2 = [3 \ 3 \ 0]^T$, $P_3 = [3 \ 2 \ 0]^T$.
Find the equation of the resulting Bezier curve. Also find points on the curve for $u=0$, $u=1/4$, $u=1/2$, $u=3/4$, $u=1$.

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OR

- 2 (a) What are the properties of Bezier curves, explain in detail.

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- (b) A cubic spline curve is defined by the equation

$P(u) = C_3u^3 + C_2u^2 + C_1u + C_0$, $0 \leq u \leq 1$ where C_3 , C_2 , C_1 and C_0 are the polynomial coefficients. Assume that these coefficients are known, find the four control points that define an identical Bezier curve.

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UNIT - III

- 3 (a) Prove that a bicubic surface patch degenerates to a cubic spline if the four corner points of the patch are collapsed to two.

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- (b) What are the properties that a solid model or an abstract solid should capture mathematically to be defined as a valid solid model.

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OR

- 3 (a) Write the Euler's formula for closed and open polyhedral objects and define in detail the terms associated.

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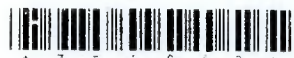
- (b) Elaborate the following Euler operators : MBFV, MEV, KFEVMG, KFEVBV, MME and write the operations for which they are used.

10

UNIT - IV

- 4 (a) Diagrammatically present Hierarchy of projections and explain all of them.

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- (b) Write short notes on :
 - (i) transformation of a point
 - (ii) Foreshortening factor.

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OR

- 4 (a) What do you understand by Constructive solid Geometry (CSG) and its data structure.

10

- (b) What do you understand by concatenation ?

6

UNIT - V

- 5 Explain Cohen Sutherland algorithm used for line segment clipping with a suitable example.

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OR

- 5 (a) Differentiate between window and view port.

8

- (b) What do you understand by coherence in object space and image space.

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