

C.U.SHAH UNIVERSITY

WADHWAN CITY

University (Winter) Examination -2013

Course Name: *M.Tech(Mech) Sem-I* Subject : **Computer Aided Design and Modeling**Marks : **70**Duration :- **2:30 Hours**Date : **06/01/2014****Instruction**

- (1) Attempt all Questions of both sections in same answer book / Supplementary.
- (2) Use of Programmable calculator & any other electronic instrument is prohibited.
- (3) Instructions written on main answer Book are strictly to be obeyed.
- (4) Draw neat diagrams & figures (If necessary) at right places.
- (5) Assume suitable & Perfect data if needed

SECTION-I**Q-1 Attempt the following.**

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| (a) | State the advantages of CAD/CAM. | 02 |
| (b) | What is meant by Surface Modeling? | 02 |
| (c) | State the advantages of wire frame Modeling. | 02 |
| (d) | Define: Synthetic Curves. | 01 |

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|-----|-----|--|----|
| Q-2 | (a) | What do you understand by geometry and Topology in solid Modeling? | 04 |
| | (b) | Differentiate clearly between conventional design and computer aided Machine design. | 05 |
| | (c) | Write a short note on Wire frame modeling. | 05 |

OR

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|-----|-----|---|----|
| Q-2 | (a) | Explain following entities used in surface Modeling.
(1) Ruled Surface. (2) Tabulated Surface. | 04 |
| | (b) | Explain characteristics of Bezier Curve. | 05 |
| | (c) | Explain various commonly used primitives for solid modeling. | 05 |

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|-----|-----|---|----|
| Q-3 | (a) | What do you understand by C-rep and B-rep approaches in solid modeling? Compare them. | 07 |
| | (b) | The Coordinates of four data points P_0 , P_1 , P_2 , and P_3 are: (2,2,0), (2,3,0), (3,3,0) and (3,2,0) respectively. Find the equation of the Bezier curve and determine the coordinates of points on curve for $u=0, 0.25, 0.5, 0.75$ and 1.0. | 07 |

OR

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|-----|-----|---|----|
| Q-3 | (a) | What is Feature base Modeling? Explain the steps used in creating Model using features. | 07 |
| | (b) | Write a parametric equation of a circle having end Points of diameter as $P_1(2,3,6)$ and $P_2(8,7,6)$. Calculate the coordinates of points on a circle. | 07 |

SECTION-II**Q-4 Attempt the following.**

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| (a) | What is meant by a scan conversion? | 02 |
| (b) | What is meant by Homogeneous Coordinate System? | 02 |
| (c) | List major CAD software's available in the market. | 02 |
| (d) | Why standardization is needed in computer graphics? | 01 |



- Q-5 (a) Describe the IGES Methodology. 04
 (b) Explain the following two-dimensional geometric transformation. 05
 (1) Translation (2) Rotation.
 (c) Explain Bresenham's algorithm for generation of line. 05
- OR**
- Q-5 (a) Describe the various standard data exchange formats currently in use. 04
 (b) Discuss the important features of Pro-Engineer solid modeling software 05
 (c) Explain Bresenham's algorithm for generation of Circle. 05
- Q-6 (a) Prepare a C program for the design of Shaft subjected to Bending & Twisting Moment. 07
 (b) Using Bresenham's line algorithm, find the pixel positions along the line path between end points (21, 11) and (26, 15). 07
- OR**
- Q-6 (a) Prepare a C program for the design of Bell Crank Lever. 07
 (b) A Triangle PQR with Vertices P (2, 5) Q (6, 7) and R (2, 7) is to be reflected about line $Y = 0.5 X + 3$. Determine the Concatenated transformation matrix. 07

