

01475

**BACHELOR OF TECHNOLOGY IN
MECHANICAL ENGINEERING
(COMPUTER INTEGRATED
MANUFACTURING)**

Term-End Examination

June, 2010

BME-002 : COMPUTER AIDED DESIGN

Time : 3 hours

Maximum Marks : 70

Note : Attempt any seven questions. Use of calculator is allowed. Assume any data if missing/required.

1. Highlight the important parameters that need to be considered while selecting a CAD system. Explain types of plotters with neat sketch. **5+5**

2. Perform a three point perspective projection of an unit cube as shown in the figure-1 from center of projection at $X = -10$, $Y = -10$ and $Z = 10$ projected onto $Z = 0$ plane. Find new co-ordinates of the cube : **10**

Draw perspective projection on $Z = 0$ plane and also draw distorted cube.

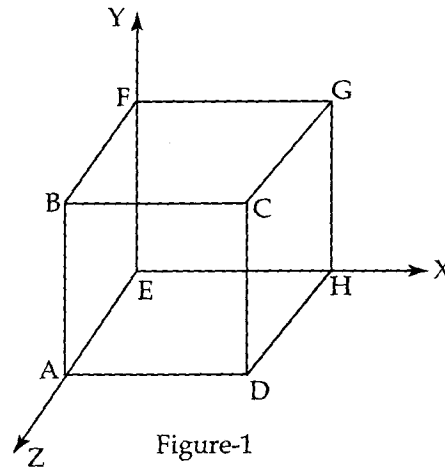


Figure-1

- | | | |
|----|---|---|
| 3. | (a) Give atleast five applications of visual realism in enhancing our knowledge and training skills. | 5 |
| | (b) Draw a CMY colour cube showing all colours on the co-ordinate, write its importance. | 5 |
| 4. | (a) Enlist different functional areas of geometrical modelling. | 5 |
| | (b) Explain parametric and non-parametric representation of curves. | 5 |
| 5. | (a) Define synthetic curves. Name different types of synthetic curves normally provided by major CAD/CAM systems. | 5 |

- (b) Calculate the mid point of Hermite cubic curve defined by the end points and tangent vectors as follows : 5
- $V_0(0) = [1, 1]$, $V_1(1) = [6, 5]$
 $V'_0(0) = [0, 4]$ and $V'_1(1) = [4, 0]$
6. A Bezier curve of degree 2 defined by three control points P_0 , P_1 and P_2 in a portion of a conic section. What type of conic section is it ? Is it a portion of a parabola, a hyperbola or an ellipse ? You can assume the given control points are in the xy -coordinate plane. Give a neat sketch in support of your answer. 10
7. Show that if the boundary curves of a bilinear coons patch are co-planar, the resulting patch is also planar. 10
8. Explain Euler-Poincare formula for polyhedral solids. Discuss its applications in solid modelling. 10
9. (a) What are the various methods of representation of the solids ? 5
 (b) Why CAD/CAM data exchange standards are required ? Explain. 5
10. Discuss the salient features of STEP that are applicable for transfer of manufacturing data base. 10