

**B.Tech. – VIEP – MECHANICAL ENGINEERING  
(BTMEVI)****Term-End Examination****December, 2015****BIME-018 : COMPUTER AIDED DESIGN***Time : 3 hours**Maximum Marks : 70*

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**Note :** *Attempt any five questions. All questions carry equal marks. Use of scientific calculator is permitted.*

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1. (a) What is geometric modelling ? Compare the features of 3D model with 2D model. 7
- (b) What are the output devices used in CAD systems ? Explain any two devices with neat sketches. 7
  
2. (a) What is visualization of the model ? Differentiate between random scan display and raster scan display. 7
- (b) Explain the configuration of graphic software in a CAD system with a suitable block diagram. 7

3. (a) What are the various types of 2D geometric transformations ? Explain with suitable examples. 7
- (b) What are the types of co-ordinate systems used in a CAD system ? Explain with suitable examples. 7
4. (a) List the different properties of a Bezier curve and also describe the shapes of Bezier curves for varying the control points. 7
- (b) State the difference between Exact fit and Best fit polynomials. 7
5. (a) Explain the parametric and non-parametric representation of curves. 7
- (b) Find out the transformation matrix to rotate an object by  $90^\circ$  counter-clockwise about its centre. The centre of the object is at [5, 4]. 7
6. (a) Explain the constructive solid geometry for representation of solids in a CAD system with suitable examples. 7
- (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  $t = 0.4$ . 7

7. (a) Why do we need synthetic surface ?  
Explain with suitable examples. 7
- (b) Explain the features of colour model application in a CAD system with suitable examples. 7
8. (a) Use Newton-Raphson method to obtain a root to three decimal places, of the following equation : 7
- $$x^3 + 3x^2 - 3 = 0.$$
- (b) Explain the general structure of a finite element procedure with a neat diagram. 7
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