

**B.Tech. MECHANICAL ENGINEERING
(COMPUTER INTEGRATED
MANUFACTURING)**

Term-End Examination

June, 2016

00570

BME-002 : COMPUTER AIDED DESIGN

Time : 3 hours

Maximum Marks : 70

***Note :** Attempt any **seven** questions. Use of calculator is allowed. Drawing of the diagram is **compulsory**, wherever instructed in the numerical question.*

1. Describe different types of projections with the help of neat sketches. 10
2. Elaborate on the application of CAD. 10
3. Considering parametric and non-parametric representation of curves, which representation is better and why? 10
4. Using method of least squares, fit a relation of the form $y = au'$ to the following data. Also estimate y (3.5). 10

| | | | | | |
|---|-----|-------|-------|-------|-------|
| x | 2 | 3 | 4 | 5 | 6 |
| y | 144 | 172.8 | 207.4 | 248.8 | 298.3 |

5. Find the equation of cubic B-spline curve : 10
 The coordinates of four points are given by
 $P_0 = [2 \ 2 \ 0]^T$, $P_1 = [2 \ 3 \ 0]^T$, $P_2 = [3 \ 3 \ 0]^T$ and
 $P_3 = [3 \ 2 \ 0]^T$.
6. (a) Compare B-spline and Bezier curve. 5
 (b) Why are synthetic curves used for many engineering applications ? 5
7. Find the equation of the Bezier surface that covers the region R defined by line $y = 0$, $y = 1$, $x = 0$ and $x = 1$. Also, find the surface vectors and its mid-point. 10
8. (a) State Euler's equation and demonstrate how it can be used to validate a solid model. 5
 (b) Compare C-rep and B-rep modelling techniques. 5
9. Why are CAD/CAM data exchange standards required ? Explain in detail. Name some of the standards used and explain the salient features if any. 10
10. Describe Universal Product Representation (UPR) architecture with the help of a suitable diagram. 10