Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–VI(NEW) – EXAMINATION – SUMMER 2019**

**Subject Code:2162006 Date:18/05/2019**

**Subject Name:Computer Aided Design for Mechatronics**

**Time:10:30 AM TO 01:00 PM Total Marks: 70**

**Instructions:**

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

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|---|---|---|---|
| **Q.1** | **(a)** | What do you mean by CAD/CAM? State limitations of it. | **03** |
| | **(b)** | Draw the product Cycle with CAD/ CAM. | **04** |
| | **(c)** | What is Computer Graphics? Give benefits & general application of it. | **07** |
| **Q.2** | **(a)** | Explain the Working of Digitizers & Laser Printers. | **03** |
| | **(b)** | Compare between vector display & Raster Display. | **04** |
| | **(c)** | Explain Brensham's Algorithm for generation of Circles & also write down advantages of it. | **07** |
| | | **OR** | |
| | **(c)** | What is Graphic Standards? Enlist them. Explain any one of them in brief. | **07** |
| **Q.3** | **(a)** | Differentiate between B-rep & CSG. | **03** |
| | **(b)** | Identify the pixel location that will be chosen by the DDA algorithm while scan converting a line from screen co-ordinate (10, 30) to (19, 36). | **04** |
| | **(c)** | A rectangle is formed by four points whose coordinates are: (50, 50), B (100,100), C (100, 80) & D (50, 80). Determine the coordinate's 0of four points for new rectangle in reduced size using the scaling factors 0.5 & 0.6 along X & Y direction respectively. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Define following terms: i) Inverse Transformation ii) Homogeneous co-ordinate system | **03** |
| | **(b)** | Comparision between IGES & PDES. | **04** |
| | **(c)** | A Triangle PQR with vertices P (20, 20), Q (50, 20) & (20,140) isto be enlarged twice along X direction & compressed to half along Y direction. Determine the coordinates of the vertices for a scaled triangle. | **07** |
| **Q-4** | **(a)** | Explain following Entities used in surface Modeling i) Ruled Surface ii) Plain Surface. | **03** |
| | **(b)** | What is Feature based Modeling? Explain in detail. | **04** |
| | **(c)** | The co-ordinates of four control points P0, P1, P2, & P3, relative to WCS are : (2,2,0), (3,3,0) ,(3,4,0), & (4,3,0)respecttively . Find the equation of the Bezier curve & determine the coordinates of points on curve for u =0, 0.25, 0.5, 0.75, 1.0. | **07** |
| | | **OR** | |
| **Q-4** | **(a)** | Explain the approaches of genration of analytical curve. | **03** |
| | **(b)** | Develop parametric equation for i) Line ii) Elipse. | **04** |
| | **(c)** | A Bezier curve is controlled by three points (4, 2), (0, 0) & (2, 8). Determine i) the degree of Bezier curve. ii) The parametric eqation of Bezier curve. | **07** |

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|---|---|---|---|
| **Q-5** | **(a)** | What is Geometric Modeling? Explain Methods of Geometric Modeling. | **03** |
| | **(b)** | Explain advantages & characteristics of Bezier Curve. | **04** |
| | **(c)** | Explain Langranj Multiplier Method with suitable example. | **07** |

**OR**

| | | | |
|---|---|---|---|
| **Q-5** | **(a)** | What do you mean by 2D & 3D wire frame Modeling? Differentiate them. | **03** |
| | **(b)** | Define Primary & Subsidiary equation in Optimizations. | **04** |
| | **(c)** | What is Design Optimization? Explain its application &limitations in engineering design. | **07** |

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