

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER- VI (Old) EXAMINATION – WINTER 2019****Subject Code: 161903****Date: 04/12/2019****Subject Name: Computer Aided Design****Time: 02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

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

- Q.1** (a) Distinguish Between Conventional Design and Computer Aided Design system with CAD architecture. **07**
(b) Enlist the various methods of geometric modeling. Discuss wire frame modeling in detail. **07**
- Q.2** (a) (i) Explain IGES graphic standard **07**
(ii) Draw and explain 2D element. **07**
(b) Using DDA algorithm, find the Pixel value position of line between points (2,10) and (6,15). **07**
- OR**
- (b) Write Bresenham's line algorithm. Determine intermediate pixels for line starting from (1, 1) to (9, 6). **07**
- Q.3** (a) A triangle ABC with vertices A(0,0), B(4,0) and C(2,3) is Translated through 4 and 4 units along X and Y directions respectively and then Rotated through 90° in counterclockwise direction about the new position of point C. Find:
(1) The concatenated transformation matrix and
(2) The new position of triangle. **07**
(b) State the properties of Hermite Cubic Splines. How these curves are differing from Bezier curves? **07**
- OR**
- Q.3** (a) For ΔABC with coordinates A(5,5), B(8,5) and C(5,10), find new vertex position if it reflected about a line $y = 2x + 4$. **07**
(b) What are the major advantages and applications of B-Spline curves? **07**
- Q.4** (a) Explain ruled surface, surface of revolution and tabulated surface. **07**
(b) Explain constrained based solid modeling with a neat sketch. **07**
- OR**
- Q.4** (a) Explain different types of analytical surfaces used in modeling. **07**
(b) Explain Johnson method of optimum design with an example. **07**
- Q.5** (a) Classify optimization problems on various bases. **07**
(b) A stepped shaft is as shown **Fig. 1**. Determine the stresses and deflections in each of the sections. Assume uniform material for the complete shaft having a modulus of elasticity as 200 GPa and axial force F as 35 KN. **07**
- OR**
- Q.5** (a) Discuss in detail about the applications of optimization in engineering. **07**
(b) A system of springs is as shown in **Fig.2**. Determine the overall stiffness matrix and determine the deflections of each of the springs. **07**

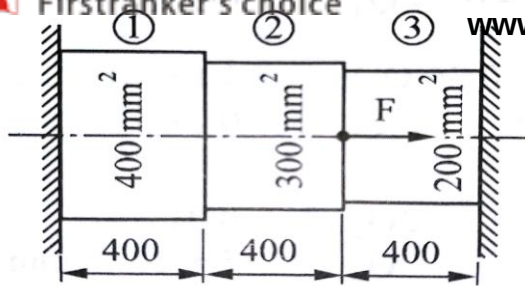


Fig.1.

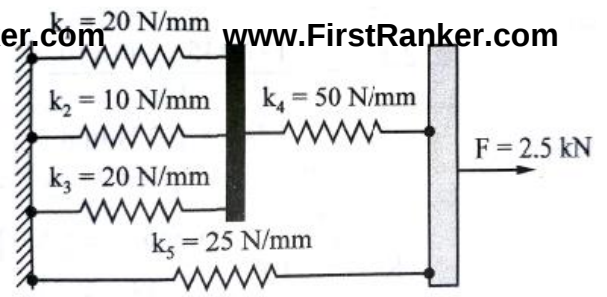


Fig.2.

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