

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VIII • EXAMINATION – SUMMER 2013****Subject Code: 180205****Date: 09-05-2013****Subject Name: Automotive CAD****Time: 10.30 am - 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.

- Q.1** (a) List different CAD software and explain minimum requirement in computer for installing any one with its capability. **07**
 (b) Write Computer programme for designing a helical compression spring. **07**
- Q.2** (a) Explain DDA algorithm for representation of line with suitable example. **07**
 (b) Write short note on (1) GKS (2) communication standards. **07**
- OR**
- (b) Compare surface models with solid models and wireframe models separately. **07**
- Q.3** (a) Reflect a diamond shape polygon whose vertices are A (-3,0), B (0,-2), C(3,0) and D(0,2) about the horizontal line $y=2$ and $y=x+2$ line. **07**
 (b) Prepare computer program using C language for the design of shaft on the basis of torsional rigidity. **07**
- OR**
- Q.3** (a) A mirror is placed vertically such that it passes through the point (10,0) and (0,10) find the reflected view of triangle ABC with coordinate A(5,50), B(20,40) and C(10,70). **07**
 (b) Prepare computer program using C language for the design of connecting rod of IC engine. **07**
- Q.4** (a) What is optimization? Give classification of it. **07**
 (b) Apply Gauss elimination method to solve the equation **07**
 $X+4Y-Z = -5$; $X+Y-6Z = -12$; $3X-Y-Z = -12$
- OR**
- Q.4** (a) Write down steps for building up a 3-D CAD model of a Flange using any solid model software package. **07**
 (b) Develop a C program to implement the Newton-Raphson method to find the root of equation $X^3 - 4X - 9 = 0$. **07**
- Q.5** (a) Discuss preprocessor and post processor of FEM. **04**
 (b) As shown in Fig.1, a load $P = 60 \times 10^3$ N is applied as shown. Determine the displacement field, stress and support reactions on the body. **10**
 Take $E = 20 \times 10^3$ N/mm²

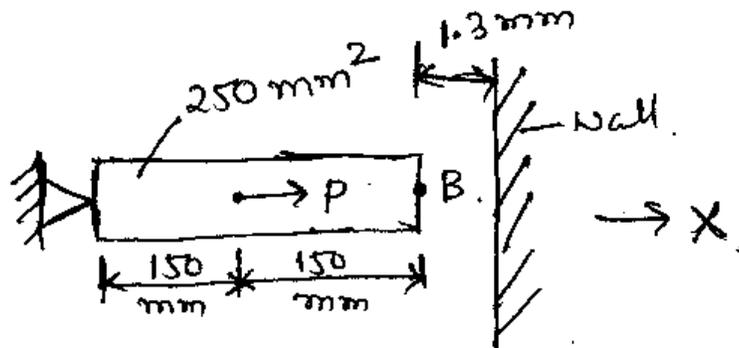


Fig.1

OR

- Q.5 (a) Consider a bar as shown in fig.2. determine the nodal displacements, element stresses and support reactions. Solve this problem by hand calculation adopting Penalty approach method take $E=200 \times 10^9 \text{ N/m}^2$, $P=300 \text{ KN}$ 12

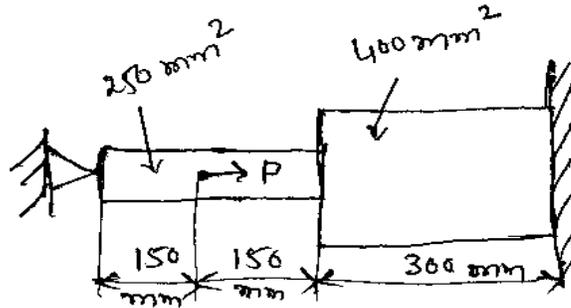


Fig2.

- (b) What is element? Give types of it.

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