Seat No.: _____ Enrolment No._____

# 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 seperately. | **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 tortional rigidity. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Amirror is placed vertically such thatit 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<br>X+4Y-Z = -5 ; X +Y-6Z = -12 ; 3X- Y- Z = -12 | **07** |
| | | **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 rapson 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.<br>Take $E=20 \times 10^3$ N/mm$^2$ | **10** |

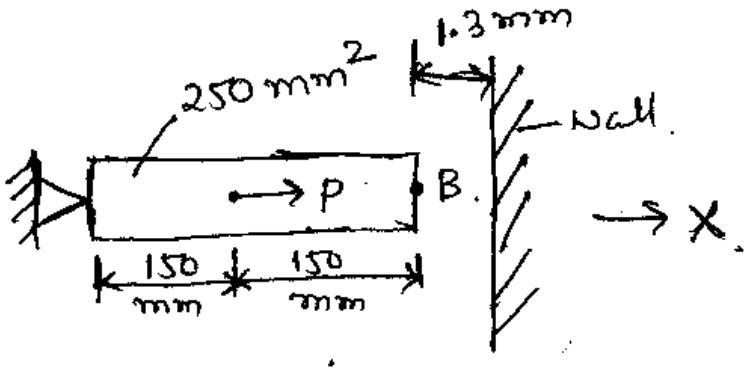

Fig.1

**OR**

**Q.5** **(a)** Consider a bus 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= $200 \times 10^9$ N/m$^2$ , P=300 KN **12**

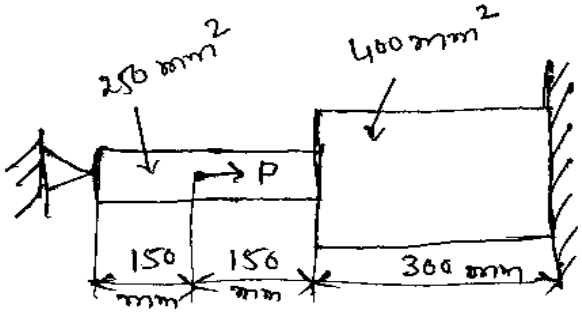


Fig2.

**(b)** What is element? Give types of it. **02**

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