

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- VIth SEMESTER-EXAMINATION – MAY- 2012****Subject code: 161903****Date: 15/05/2012****Subject Name: Computer Aided Design (CAD)****Time: 10:30 am – 01:00 pm****Total Marks: 70****Instructions:**

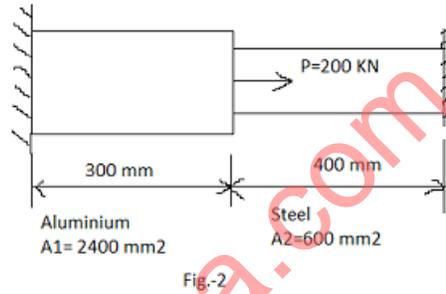
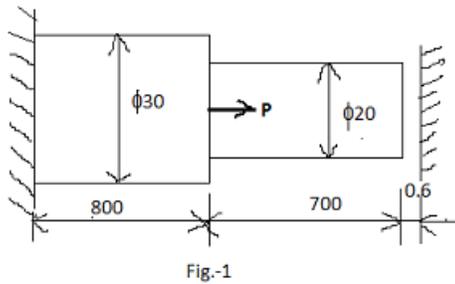
1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) What do you mean by Computer Aided Design (CAD)? Discuss reasons for implementing CAD in industry. **07**
- (b) Give your Comments on the need for standardisation in Computer Graphics. Briefly discuss about various graphics standards available. **07**
- Q.2** (a) A triangle ABC with vertices A(0,0), B(4,0) and C(2,3). Perform the following operations for it. (i) Translation through 4 and 2 units along X and Y directions respectively. (ii) Rotation through 90^0 in counterclockwise direction about the new position of point C. **07**
- (b) Explain DDA algorithm for generation of line. **07**
- OR**
- (b) Explain Bresenham's algorithm for generation of line. **07**
- Q.3** (a) Briefly discuss about B-spline curve and Bezier curve. **07**
- (b) List various approaches used for creating solid models. Discuss about Constructive solid modelling (C-Rep) and Boundary representation (B-Rep) approaches. **07**
- OR**
- Q.3** (a) What is feature based modelling? Discuss various steps involved in creation of models using features. **07**
- (b) What do you mean by 2D and 3D wireframe modeling? Differentiate between wireframe modeling and solid modeling technique for CAD. **07**
- Q.4** (a) Explain the concept of finite element method. Discuss about various steps involved in finite element analysis. **07**
- (b) Consider the stepped bar shown in fig. -1. A load $P=200$ KN is applied as shown. Determine the nodal displacements, element stresses, and support reactions. use elimination approach for boundary conditions. Take $E=2 \times 10^5$ N/mm². **07**
- OR**
- Q.4** (a) State and describe the various types of elements used in the finite element analysis. **07**
- (b) A stepped bimetallic bar made of Aluminium ($E= 70 \times 10^3$ N/mm²) and steel ($E= 200 \times 10^3$ N/mm²) is subjected to an axial load of 200 KN, as shown in the fig.- 2. Using finite element method, determine (i) the nodal displacements (ii) the stresses in each material and (iii) the reaction forces at the supports. **07**
- Q.5** (a) Discuss in detail about the applications of optimization in engineering. **07**
- (b) Classify optimization problems on various basis. **07**

OR

- Q.5** (a) Explain the concept of optimization in engineering. **07**
 (b) A cylindrical shell of the heat exchanger is required to accumulate a total of 100 m length of standard diameter copper tubes. 1 m² cross sectional area inside the shell can accommodate 200 copper tubes. Design heat exchanger shell with an objective of minimizing the cost of H.E. by using following data. **07**
 (i) cost of copper tubes= Rs. 20,000
 (ii) cost of H.E. shell = Rs. 60,000 D^{2.5} L
 (iii) cost of floor space occupied = Rs. 10,000 DL
 Where D = Diameter of H.E. shell in m
 L= length of H.E. shell in m

All dimensions are in mm.



downloaded from
 StudentSuvidha.com