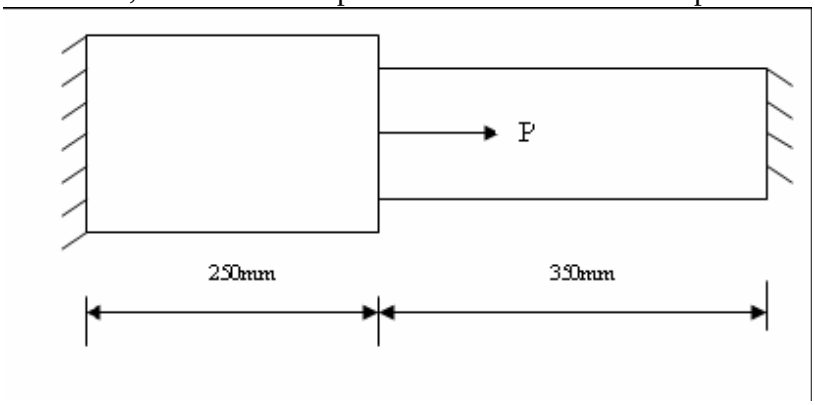
QUESTION BANK
COMPUTER AIDED DESIGN

1.	Discuss the reasons for implementing CAD. Also draw a diagram showing product cycle with the implementation of CAD.
2.	What are different types of geometric technique available? Describe the common facilities available in a solid modeling package.
3.	A rectangle formed by four points PQRS whose coordinates are P(50,50),Q(100,50),R(100,80),S(50,80).Find the new coordinates of the rectangle in reduced size using scaling factors $S_X = 0.5$ and $S_Y = 0.6$.
4.	Explain concept of GKS graphic standard in detail with the implementation.
5.	Find the refection matrix when the axis of reflection is line y = 3x +2.
6.	Explain various types of modeling techniques.
7.	Write Bresenham's algorithm for generation of line also indicate which raster locations would be chosen by Bresenham's algorithm when scan converting a line from screen co-ordinate (2,0) to (11,4).
8.	What are the capabilities of a typical general purpose FEA Package? Enumerate various type of design problem that could be handled by FEA.
9.	What is the working principle of following hardware parts of CAD workstation? (i) Plotter (ii) Graphical Digitizer Table (iii) Keyboard.
10.	Write roll of ICG in CAD.
11.	Write short note on CSG and B-rep.
12.	The two end points of a line segment have coordinates (1,3) and (3,6). If this is to be scaled to twice its present size, write the transformation matrix and the coordinates of the new end points.
13.	With help of Bresenham's line algorithm highlight the pixel to be illuminated if a line is to be drawn between end points (20,10) and (30,18).
14.	Explain process of optimization along with suitable example.
15.	Discuss different types of elements used in FEM.
16.	Derive an expression for stiffness matrix of one dimensional truss element.
17.	What is geometric transformation? Explain Translation , rotation, scaling with respect to 2D

18.	What is CAD database? Explain the advantage of database with popular database models.
19.	Importance of RDBMS in CAD.
20.	Write a short note on Elements used in FEA
21.	What do you mean by compatible and incompatible problem in optimum design? Explain
22.	Differentiate between Engineering Design and Optimum Design
23.	What is the working principle of (i) Graphical Digitizer Table (ii) Keyboard?
24.	Discuss Johnson method of optimum design.
25.	Find the equation of a Bezier curve which is define by the four control points as (80,30,0),(100,100,0),(200,100,0) and (250,30,0).
26.	Why do you consider studying geometric modeling is important in relation to CAD in manufacturing industry? Explain (i) wire frame modeling (ii) surface modeling (iii) solid modeling with suitable example.
27.	What is transformation of geometry? With suitable figure and matrix discuss following transformation. (i) Scaling (ii) Reflection (iii)Rotation
28.	Explain the various steps required to solve mechanical problem using finite element analysis
29.	Describe Compare GKS-3D and PHIGS.
30.	Give a brief description about the Bspline curves.
31.	What is FEA ? discuss its engineering applications
32.	What do you mean by primary and subsidiary design equation? Explain (8) With example
33.	Explain **Bresenthham** algorithm for line .
34.	Write short note on CSG and B-rep.
35.	With help of suitable example explain 2D Transformation (i) Translation and (ii) Shearing
36.	Differentiate between GKS and PHIGS
37.	Write a short note on Bezier surfaces.
38.	Explain Hermite cubic spine curve with neat sketch also write its characteristics and obtain the parametric equation for the same.
39.	A two step as shown in figure is subjected to thermal loading conditions. An axial load P = 20000 N applied 20° C to the end. The temperature of the bar is raised by 50 ° C. calculate element stiffness matrix and global stiffness matrix

	Consider E1 = 70 x 103 N/mm2, E2 = 200 x 103 N/mm2, A1 = 700mm2, A2 = 1000mm2, α1 = 23 x 10-6 per °C and α2 = 11.7 x 10-6 per °C 
40.	Axial load P = 400 KN is applied at 25° C to the rod as shown in fig. The temperature is then raised to 60° C. The coefficient of thermal expansion for Aluminium is 23x10-6 per °C and Steel is 11.7x10-6 per °C. AAl = 900 mm2, ASteel = 1200 mm2, EAl = 70 x 109 N/m2, ESteel = 200 x 109 N/m2. Using FEM, (1) Determine the nodal displacement and element stresses. (2) The reaction forces at the supports.