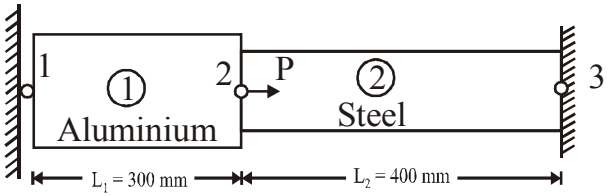
(b) Determine the nodal displacement at node 2, stresses in each material and support reactions in the bar shown in fig. below due to applied force = 500 kN. Given $A_1$ = 2400 $mm^2$, $L_1$ = 300 mm, $E_1 = 0.7 \times 10^5$ $N/mm^2$; $A_2$ = 1200 $mm^2$, $L_2$ = 400 mm. $E_2 = 2 \times 10^5$ $N/mm^2$. **5+10**




**8.** (a) Explain the post processing phase in reference to FEM software package.

(b) Discuss dynamics analysis using FEM.

(c) Write a short note on applications of FE analysis to 1-D problem. **3×5=15**



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# H-61

## B. Tech. EXAMINATION, May 2018

(Eighth Semester)

(B. Scheme) (Main & Re-appear)

(ME)

ME402B

COMPUTER AIDED DESIGN

*Time :* 3 *Hours*] [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

**Note** : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

## Unit I

**1.** (a) Differentiate between 2D and 3D geometric models.

(b) Explain Implicit and Explicit functions.

(c) Discuss the historical developments of CAD/CAM. **3×5=15**

**2.** (a) What is Geometric Transformation ? Find the reflection matrix when the axis of reflection is given by $y = 5x$. Also determine the reflection of point (7, 5) about this axis.

(b) Differentiate between orthographic and perspective projections. **10+5**

## Unit II

**3.** Explain the parametric representation of following analytical surfaces : **15**

(a) Ruled surface

(b) Surface of revolution

(c) Coons surface

(d) Plane surface.



**4.** Differentiate between Bezier, B-Spline and Hermite Curves. Find the equation of a Hermite cubic spline that passes through points (1, 2) and (3, 4) and whose tangent vectors are the two lines connecting these two points with point (3, 5). **15**

## Unit III

**5.** What are the basic elements of a boundary represented solid model scheme ? Explain briefly. Develop an algorithm for planer intersection polygon of two solid using B-rep schemes. **15**

**6.** Explain in brief the basic elements of CSG model. Discuss the main building operations of CSG schemes with examples. **15**

## Unit IV

**7.** (a) What is finite element analysis ? How does it work ?