

[03- 4203]

IV/IV B.E. DEGREE EXAMINATION

Second Semester

Mechanical Engineering

COMPUTER AIDED DESIGN

(Common for Mechanical and M.P. & I Engineering)

(Effective from the admitted batch of 1999-2000)

Time : Three hours

Maximum : 70 marks

First question is compulsory.

Answer any FOUR out of the remaining questions.

Answer to question no. 1 must be at one place.

All questions carry equal marks.

Assume suitable data wherever necessary.

1. (a) What is CPU? What are its functions in workstation?

(b) How joystick and light pen are used as cursor control devices?

(c) What is the transformation matrix for reflection of image?

(d) Write an algorithm to compute cross-sectional area.

(e) What are the advantages Artificial intelligence?

(f) What is B-rep solid modeling?

(g) What is inference engine in AI?

2. (a) What is CAD workstation? Explain its major components and their functions?

(b) Explain how the CAD system offers for development of database for manufacturing.

3. (a) Perform a 60° rotation of triangle ABC with vertices A (10, 10), B (70, 20), C (80, 50) about a point P (2, -1).

(b) What is homogeneous matrix? What is its importance in the application of transformations? Explain a general 3D transformation homogeneous transformation matrix?

4. What is clipping? Explain any method for line clipping. Clip the line segment AB having end coordinates A (-40, 20), B (30, 80) against a rectangular window whose lower left corner is at L (-30, 10) and upper right corner at R (20, 60).

5. (a) Explain different phases of finite element analysis.

(b) Describe how the above phases are implemented in ANSYS.

6. (a) Explain CAD application in analysis of mechanisms.

(b) How the boundary conditions are important in stress-strain analysis of an object?

7. (a) Explain CAD application in analysis of centroid and moment of inertia.

(b) Discuss the application of artificial intelligence in CAD.

8. Write short notes on the following.

(a) CAD hardware

(b) Surface modeling

(c) Shape functions in FEM.

[2490/L/08]