

B.E. Fifth Semester (Mechanical Engineering) (Old)
Computer Software Application - I : 5 SM 1

P. Pages : 2

Time : Three Hours



AU - 3119

Max. Marks : 80

- Notes :
1. All question carry equal marks.
 2. Answer **three** question from Section A and **three** question from Section B.
 3. Assume suitable data wherever necessary.
 4. Illustrate your answer necessary with the help of neat sketches.
 5. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION - A

1. a) Explain the use of computers in: 6
i) Design ii) Manufacturing

- b) What is design Workstation? 7

OR

2. a) Explain the working of following input devices used in CAD. 5
i) Digitizers ii) Scanners

- b) Explain the following types of display devices. 8
i) Direct-view storage tube ii) Raster-scan display

3. a) Explain the various cursor control devices used in CAD. 6

- b) What is interface? Compare serial and parallel interfaces. 7

OR

4. a) Explain the following two-dimensional geometric transformations. 6
i) Translation ii) Rotation
iii) Scaling iv) Reflection

- b) What is the significance of homogenous coordinates in geometric transformation? 7

5. a) Why standardization is needed in computer graphics? State the various graphics standards available. 8

- b) Distinguish between direct and indirect data exchange translators. 6

OR

6. a) What do you understand by shape based formats and product data formats? 7

- b) Explain the functions of Graphics Package. 7

SECTION - B

7. a) What do you understand by C-rep and B-rep approaches? Compare them. 7
b) What is parametric solid modeling? What are the various types of sweeps used in solid modeling? 6

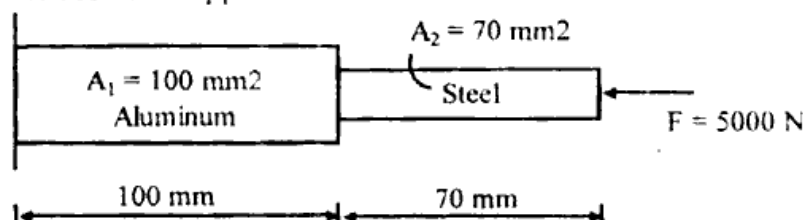
OR

8. a) With the neat sketch explain the various boolean operations used in CSG solid modeling. 7
b) What do you understand by 2D, 2½D, and 3D wire-frame models? 6
9. a) Discuss the various steps used in the finite element method. 7
b) State and describe the various types of boundary conditions used in the engineering problems. 6

OR

10. a) Explain the penalty approach used in the finite element method. 6
b) State and describe the various types of elements used in the finite element analysis. 7

11. A stepped Bimetallic bar, made of aluminum ($E = 70 \times 10^3 \text{ N/mm}^2$) and steel ($E = 200 \times 10^3 \text{ N/mm}^2$) is subjected to the axial force of 5000N as shown in figure. It is attached to the rigid wall at node 1. using the matrix analysis method determine.
i) The nodal displacements and
ii) The reaction force at support. 14



OR

12. Below figure shows two springs having stiffness 12 and 8 N/mm respectively, connected in series one end of the assembly is fixed and a force of 60N is applied at the other end, using the finite element method determine.
i) The displacement at nodes 2 & 3
ii) The deflections of individual spring
iii) The reaction force at support. 14

