M.E. First Semester (Mechanical Engineering (Adv. Manu. & Mech. Sys. Desig.)) (New-CGS)

13460 : Computer Aided Design and Engineering : 1 MMD 3

P. Pages : 2

Time : Three Hours

* 0 6 5 7 *

AW - 3549

Max. Marks : 80

Notes : 1. Answer **three** question from Section A and **three** question from Section B.
2. Due credit will be given to neatness and adequate dimensions.
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 typical product life cycle. **7**

b) Explain the different types of coordinate system. **6**

2. a) Explain the concept of layers used in various software packages. **7**

b) What is feature based modeling? Explain the steps used in feature based modeling. **6**

3. a) Explain constructive solid geometry (CSG) method of solid modeling. **7**

b) Explain Bezier curves. **6**

4. a) Explain transformation of geometry with an example. **7**

b) Explain the various mating conditions in an assembly. **6**

5. a) Explain the following formats of data exchange between CAD software- **8**
i) IGES ii) STEP

b) Explain the following in assembly modeling. **6**

i) Top-Down assembly ii) Bottom-up assembly

SECTION – B

6. a) Explain the general steps of finite element method. **7**

b) Explain discretization of element in FEA. **7**

7. a) What is a shape function? State the characteristics of shape function. **6**

b) Explain the different types of boundary conditions. **7**

8. a) Explain elemental and global stiffness matrix. **6**

b) Explain constant-strain Triangle (CST). **7**

9. a) State the various applications of FEA in heat transfer analysis with suitable example. **6**

b) Explain modeling capabilities of commercial FEA softwares. **7**

10. Determine the stiffness matrix, stresses and reactions in the truss structure shown in fig. (1). Take E = 210 GPa and A = 1000 mm^2. **13**

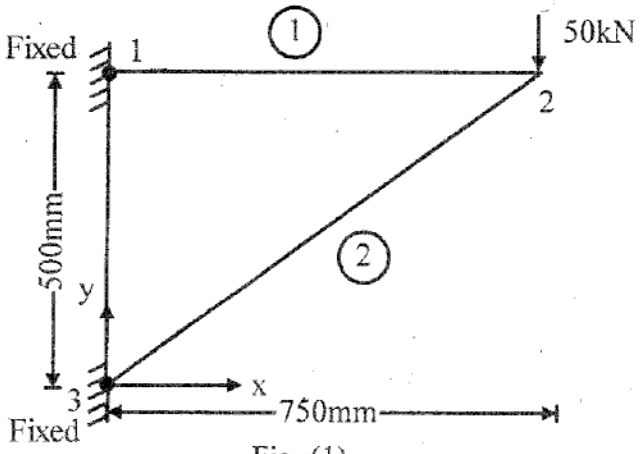

Fig. (1)

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