M.E. First Semester (Mecha. Engg. (Adv. Manu. & Mech. Sys. Design)) (New-CGS)

13460 : Computer Aided Design and Engineering : 1 MMD 3

P. Pages : 2 | **AU - 3380**

Time : Three Hours | Max. Marks : 80

* 0 3 4 1 *

Notes :
1. All question carry marks as indicated.
2. Answer **any three** question from Section A and **any three** question from Section B.
3. Due credit will be given to neatness and adequate dimensions.
4. Assume suitable data wherever necessary.
5. Illustrate your answer necessary with the help of neat sketches.
6. Non-programmable Electronic calculator permitted.
7. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION - A

1. a) Discuss the different 'Geometric Modeling Capabilities' considered while selecting the CAD/CAM system. **7**

b) Describe the concept of various co-ordinate system required for geometric display systems. **6**

2. a) Explain the scope of CAD in the conventional process of product cycle. **7**

b) Explain the terms. **6**
i) Geometric constraints
ii) Model viewing
iii) Parameters and Dimensions

3. a) Explain the concept of LAYERS in the CAD system. **6**

b) Enlist and explain various assembly Analysis activities provided by CAD systems once assemblies are created. **7**

4. a) Explain the following types of surfaces with suitable sketches. **8**
i) Plane ii) Ruled
iii) Revolved and iv) Tabulated

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

5. a) Explain in brief the description of IGES file highlighting the philosophy of conversion methodology. **7**

b) Differentiate between Bezier curve and B-spline curve. **6**

SECTION - B

6. a) Explain the general steps in FEA. **7**

b) List out the commonly used 2D (any two) and 3D (any three) finite elements with the help of neat sketches. **6**

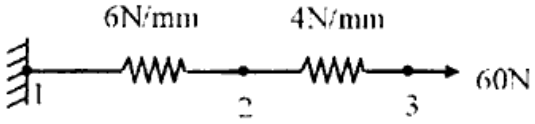
7. a) Describe by taking suitable example the following. **6**
   i) Free Meshing
   ii) Mapped Meshing
   iii) Sweep Meshing

   b) Explain the types of boundary condition in structural mechanics problems. **7**

8. a) Name the commonly used methods for deriving the element stiffness matrix equation. Briefly describe any one method by taking suitable example. **7**

   b) Explain by taking suitable example. What do you mean by the convergence of FE solution. **7**

9. Figure shows two springs having stiffness 6 N/mm and 4 N/mm is connected in a series using FEM Determine: **13**
   i) The displacement of node 2 and 3
   ii) The deflection of individual spring
   iii) The reaction force at support



10. Derive the methodology to develop a stiffness matrix and load vector for two noded beam element with two degree of freedom. **13**

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