

Total No. of Questions : 8]

SEAT No. :

P4674

[Total No. of Pages : 2

[4860] - 107

M.E. (Mechanical - Design)

COMPUTER AIDED ENGINEERING

(2008 Pattern) (Elective - III (C))

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to the candidates:*

- 1) Answers to the two sections should be written in separate answer books.*
- 2) Answer three questions from each section.*
- 3) Neat diagrams must be drawn wherever necessary.*
- 4) Figures to the right side indicate full marks.*
- 5) Assume Suitable data if necessary.*

**SECTION - I**

**Q1)** Explain the Generalized procedure in FEA in detailed steps. Define Node, Element, Domain, Continuum and Meshing. **[18]**

**Q2)** What is feature based modeling? Explain in detail. Describe Bottom Up and Top Down approach for assembly modeling with suitable example. **[16]**

**Q3) a)** What are Finite Element Method, Finite Difference Method and Finite Volume Method? Elaborate. **[8]**

b) Discuss different types of elements used in meshing in detail with their applicability. **[8]**

**Q4) a)** How Finite Element Method is better than other Numerical Techniques? Explain and List advantages and disadvantages. **[8]**

b) Define and Explain Convergence, Aspect Ratio, Warpage and Jacobian. **[8]**

**P.T.O.**

## **SECTION - II**

- Q5)** Define and Explain in detail Rotation, Reflection and Scaling in Geometric Modeling. **[18]**
- Q6)** a) What is non linearity in FEA? How it affects the solution? Explain. **[8]**  
b) Explain in detail Geometry Non Linearity and Material Non Linearity in detail. **[8]**
- Q7)** Explain the concept of Computational Fluid Dynamics in detail. What is difference between FEA and CFD from the context of application to engineering? Elaborate. List advantages of CFD. **[16]**
- Q8)** Explain in detail Model Formulation, Geometry and grid design, and boundary conditions for Computational Fluid Dynamics. Define and explain Residual. **[16]**

