Total No. of Questions : 4]

SEAT No. :

PA-10074

[Total No. of Pages : 2

[6009]-367

T.E. (Mechanical) (Insem)

COMPUTER AIDED ENGINEERING

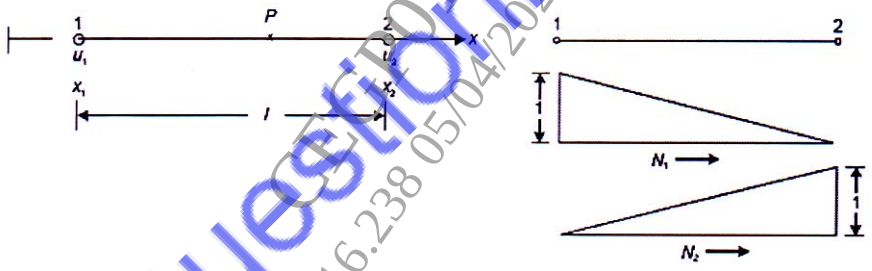
(2019 Pattern) (Semester - II) (302050)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume Suitable data if necessary.***

Q1) a) Using generalized coordinate approach, find shape functions for two noded bar element **[6]**



Figures 1

b) Write down Computer Aided Engineering (CAE) software based 3 steps: Preprocessing, Solution and Post-processing in detail. **[5]**

c) Explain in details difference between Finite Element Method and Finite Difference Method. **[4]**

OR

Q2) a) What is CAE? Explain CAE driven design process in the product development. **[6]**

b) What is meant by Shape function? With neat sketch explain the convergence criteria for Shape function in finite element Analysis. **[5]**

P.T.O.

c) Define the terminology : **[4]**

Nodal unknowns and field variables

using one dimensional bar/beam/any 2D elements

Q3) a) Explain following element quality criterion's : (Any 5) **[10]**

i) Jocabian

ii) Aspect ratio

iii) Minimum element length

iv) Skewness

v) Minimum and maximum angles

vi) Average element size

b) Differentiate between higher order elements and refined mesh. **[5]**

OR

Q4) a) Why do we carry out meshing in solving finite element problems ? How to decide element type and element length? **[7]**

b) Explain the following with examples : **[8]**

i) Effect of Mesh Density in the Critical Region

ii) Geometry Associative Mesh