Code: 9A21701 **R09**

B.Tech IV Year I Semester (R09) Supplementary Examinations June 2017

FINITE ELEMENT & MODELING METHODS

(Aeronautical Engineering)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

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1 (a) Briefly explain the equilibrium and energy method for deriving the characteristics of simplified FE model.
(b) Explain micro and macro mechanical model.

2 Explain the different types of co-ordinate systems with figures.

3 (a) Write short notes about Hermitian and Lagrangian interpolation function.
(b) Describe the concepts of nodes and elements in discretizing 1D and 2D solid continuation.

4 (a) Differentiate consistent and lumped man matrix.
(b) Write the assembly technique methods for stiffness matrix and force vectors.

5 (a) Explain the phenomenon of iso-parametric representation and with the advantages and disadvantages.
(b) Differentiate sub parametric and super parametric element with example.

6 (a) Briefly explain the one point and two point Gaussian quadrature for the numerical integration.
(b) Write short notes about frontal techniques.

7 Derive the strain displacement relation matrix for axi-symmetric triangular element. Also state the conditions for a problem to be axi-symmetric.

8 Explain the mesh generation techniques used in any two of the commercially available software.

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