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Reg. No.....

Name.....

**B.TECH. DEGREE EXAMINATION, NOVEMBER 2014**

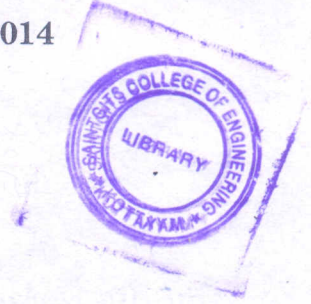
**Eighth Semester**

Branch : Civil Engineering.

**FINITE ELEMENT ANALYSIS (C)**

(Old Scheme—Prior to 2010 Admissions)

[Supplementary/Mercy Chance]



Time : Three Hours

Maximum : 100 Marks

*Answer all questions.  
Assume missing data wherever necessary.  
Every question carries 20 marks.*

- 1. (a) (i) Explain general procedure of FEA.
- (ii) Solve using Gaussian elimination technique.

$$4a + 2b + c = 12$$

$$4b + 4c = 9d = 21$$

$$4a + 10b = 5c + 4d = 32$$

$$4a + 10b + 13c + 8d = 52$$

Or

- (b) Explain displacement approach of FEA. Also explain the advantages and disadvantage of different FEA techniques.

- 2. (a) (i) Explain Energy principles.
- (ii) Explain principle of virtual displacements using an example.

Or

- (b) Illustrate the variational basis of FEA with an example.

- 3. (a) Explain Lagrangian and Hermitian interpolation.

Or

- (b) Explain conforming and non-conforming elements with an example.

- 4. (a) Derive stiffness matrix and load vector of Linear Strain Triangle.

Or

- (b) Write short notes on :
  - (i) Constrained Strain Triangle.
  - (ii) Isoparametric elements.

Turn over

(iii) Gauss quadrature.

(iv) Bar elements.

5. (a) Explain :

(i) Plate bending theory

(ii) Reduced and selective integration.

Or

(b) (i) Explain locking problems. Explain the preventive measures.

(ii) Explain Mindlin theory.

(5 × 20 = 100 marks)

