

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)

CLASS: B.Tech.
BRANCH: Mechanical

SEMESTER: V
SESSION: MO/2025

SUBJECT: ME351 FINITE ELEMENT METHODS

TIME: 02 Hours

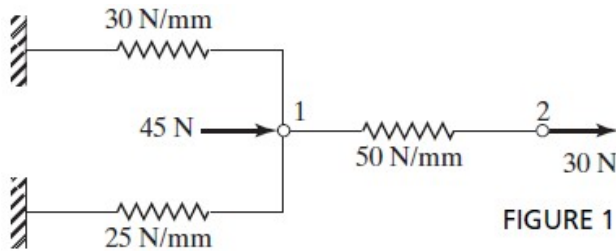
FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates
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Q.1 Explain the various steps used in finite elements in engineering, followed by a suitable example. [5] CO 1 BL 1

Q.2 Determine the displacements of the nodes of the spring system shown in Fig. 1. [5] 2 2



Q.3 Derive an expression for the potential energy approach with a neat sketch. [5] 3 1

Q.4 Derive expressions for the Galerkin and least square methods. [5] 2 3

Q.5 Derive an expression of the shape functions for a linear element with neat sketches. [5] 3 2

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