



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:

BSC IN CIVIL ENGINEERING

ECE 2408 : THEORY OF STRUCTURES V

END OF SEMESTER EXAMINATION

SERIES: APRIL 2016

TIME: 2 HOURS

DATE: 11 May 2016

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

-Drawing instruments.

This paper consists of **FIVE** questions.

Attempt question ONE (Compulsory) and any other TWO questions.

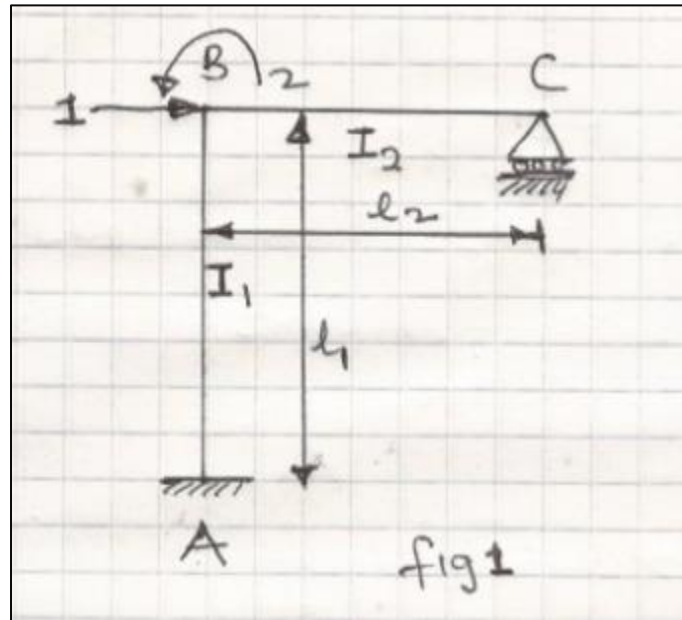
Do not write on the question paper.

QUESTION ONE (COMPULSORY)

- a) Define the term finite element and state its **THREE** advantages. **(2 marks)**
- b) Explain the terms compactibility as applied in structural analysis. **(2 marks)**
- c) Using spring analogy, construct a three by three (3X3) stiffness matrix complete with an external force vectors. **(15 marks)**

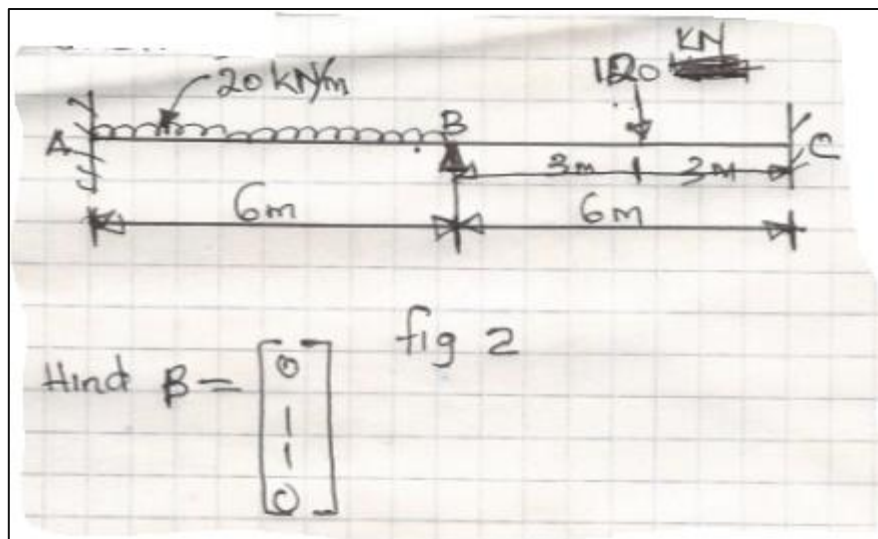
d) Generate the stiffness matrix for the structure with co-ordinates as shown in fig. 1.

(11 marks)



QUESTION TWO

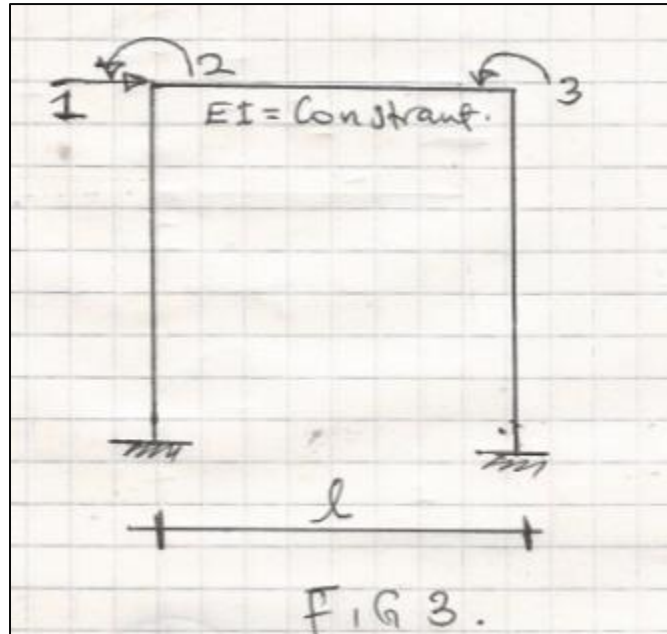
a) Using stiffness method, analyze the continuous beam shown in fig. 2. (omit the BMD sketch).



(20 marks)

QUESTION THREE

- a) Generate a stiffness matrix for the structure with coordinates as shown in fig.3. (20 marks)



QUESTION FOUR

- a) Generate the (β) matrix for the portal frame shown in fig. 4. below. (20 marks)

