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)

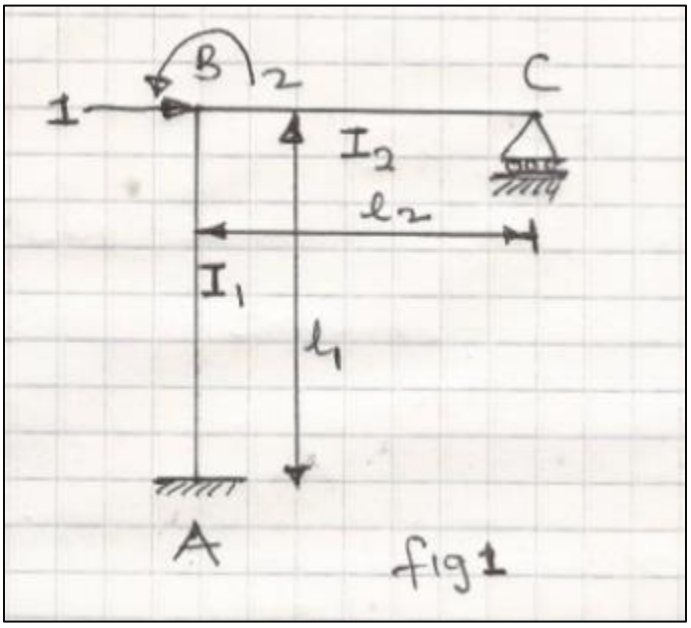
a) (i) Define finite element

(ii) State THREE applications of finite element **(2 marks)**

b) Explain the terms compactibility as applied in structural analysis. **(2 marks)**

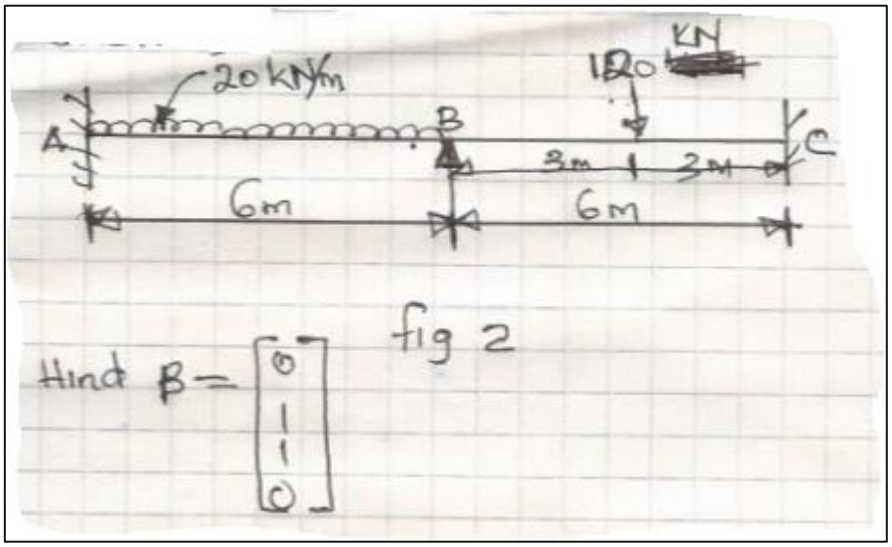
c) Using spring analogy, construct a three by three (3X3) stiffness matrix complete with an external force vectors. **(15 marks)**

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. (om++it the BMD sketch).



(20 marks)

QUESTION THREE

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

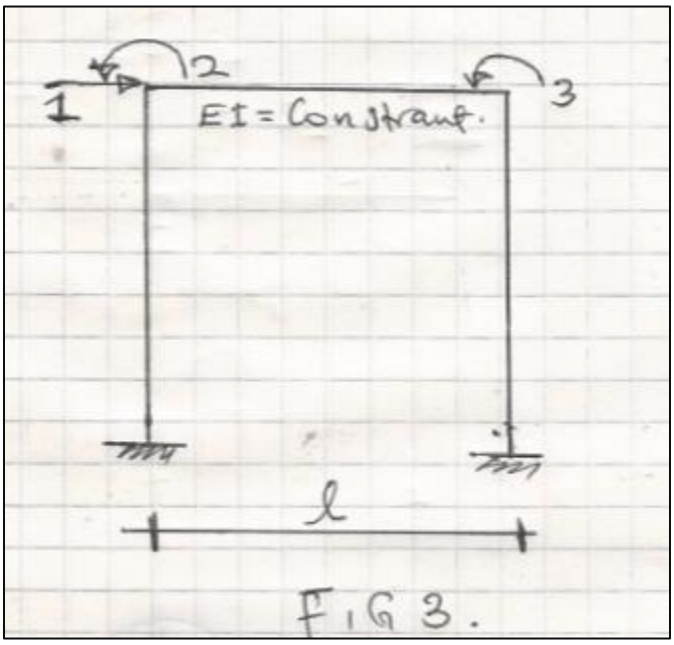


FIG 3.

QUESTION FOUR

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

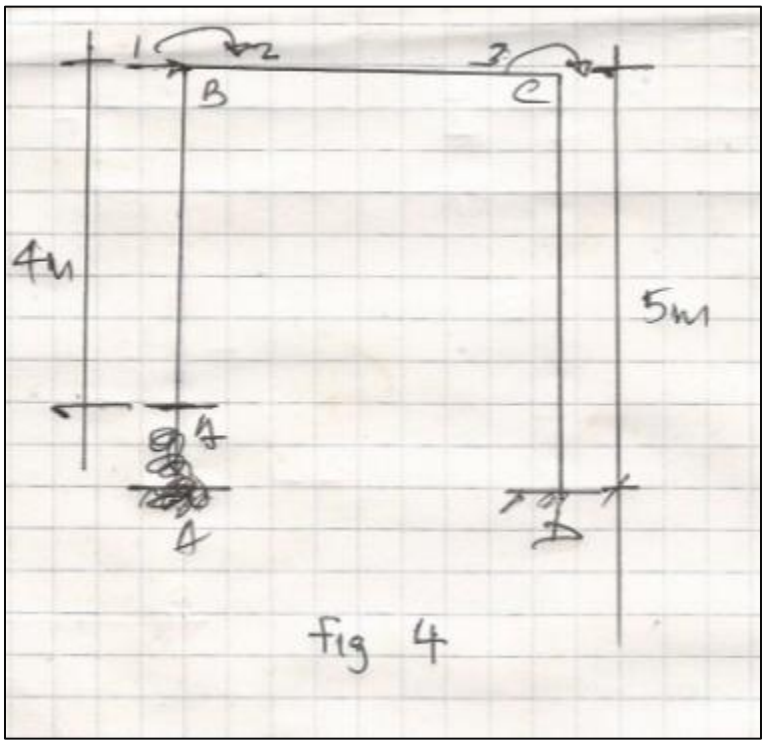


fig 4