



KENYATTA UNIVERSITY
UNIVERSITY EXAMINATIONS 2018/2019
FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF
CONSTRUCTION MANAGEMENT

BRE 201: THEORY & DESIGN OF STRUCTURE

DATE: Monday, 10th December 2018

TIME: 11.00a.m-1.00p.m

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS FROM SECTION TWO

SECTION 1: COMPULSORY (30 MARKS)

QUESTION 1

a) Describe the following structural elements

i) Truss

ii) Column

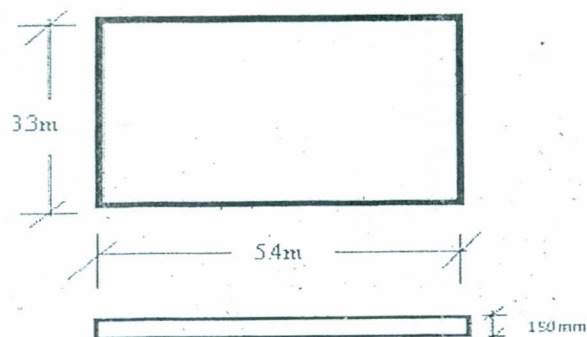
iii) Beam

(6 marks)

b) State and explain ANY THREE environmental loads acting on a structure. (3 marks)

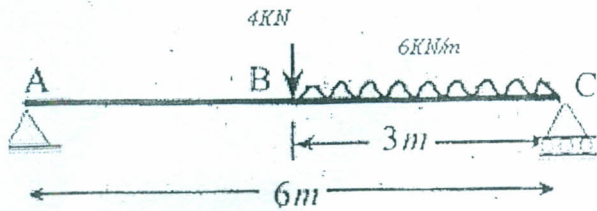
c) For an office building slab shown below, calculate the maximum design load using $1.4g_k + 1.6q_k$ loading combination. Slab dimension is 5.4m by 3.3m.

(Take concrete density = 24KN/m^3 , live loads for office buildings = 3.0KN/m^2) (4 marks)



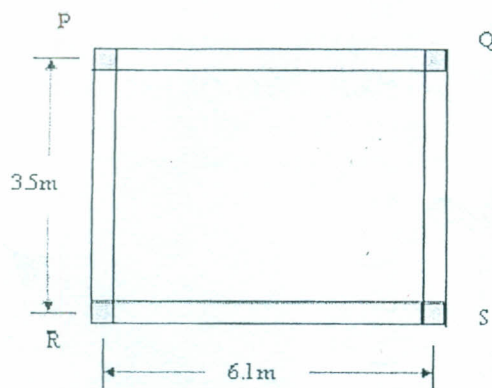
d) Find the reactions for the simply supported beam ABC as illustrated below

(4 marks)

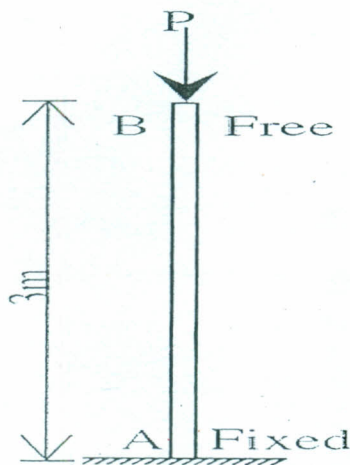


e) For a gymnasium building slab thickness 150mm and with slab finishes of 0.6 kN/m^2 shown below, calculate the loading transferred to beams PQ and PR. Slab dimension is 6.1m by 3.5m (6 marks)

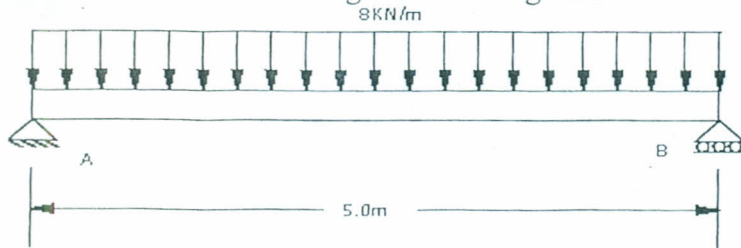
(Take concrete density = 24 kN/m^3 and live loads for gymnasium buildings = 4.0 kN/m^2)



f) A uniform column AB in height and having a section of 200mm by 175 mm is as shown below. Using Euler's formula, determine the buckling load for the column. (take $E = 200\text{ kN/mm}^2$) (For a column with one end fixed, other end completely free, $l_e = 2.0l$) (3 marks)



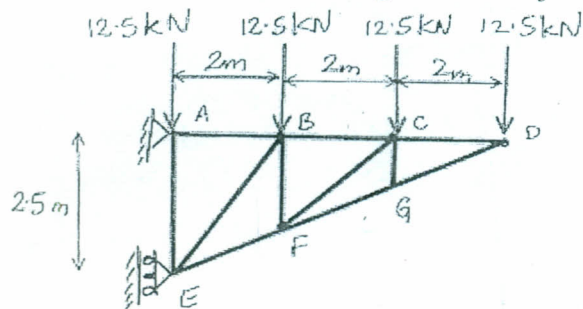
- g) For the beam shown below, compute the shear force and bending moment function and sketch the shear force and bending moment diagrams. (8 marks)



SECTION 2: ANSWER ANY TWO QUESTIONS (40 MARKS)

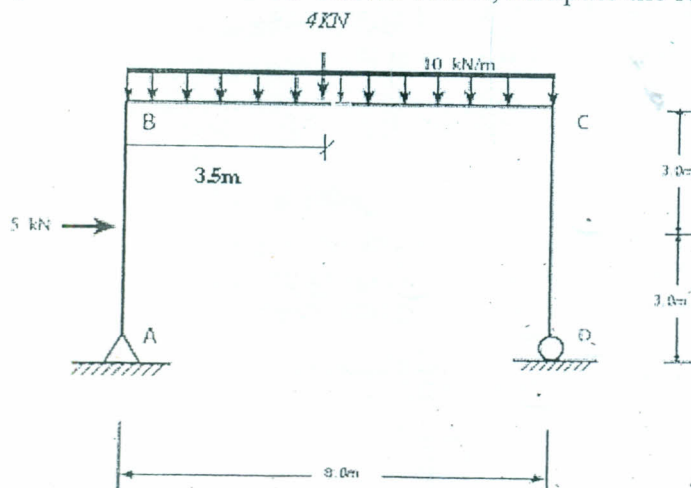
QUESTION 2

For the truss shown below, analyze the reactions at the supports and determine the internal forces in each of the members using method of joints. (20 marks)



QUESTION 3

- a) For the frame ABCD shown below, compute the reactions at supports A and D (6 marks)





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a) Describe the following structural elements

i) Truss

ii) Column

iii) Beam

(6 marks)

b) State and explain ANY THREE environmental loads acting on a structure.

(3 marks)

c) For an office building slab shown below, calculate the maximum design load using $1.4g_k + 1.6q_k$ loading combination. Slab dimension is 5.4m by 3.3m.

(Take concrete density = 24KN/m^3 , live loads for office buildings = 3.0KN/m^2)

(4 marks)

