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POLITEKNIK
Jabatan Pengajian Politeknik

EXAMINATION AND EVALUATION DIVISION
DEPARTMENT OF POLYTECHNIC EDUCATION
(MINISTRY OF HIGHER EDUCATION)

CIVIL ENGINEERING DEPARTMENT

FINAL EXAMINATION

JUNE 2012 SESSION

C5303 : THEORY OF STRUCTURES 2

DATE : 24 NOVEMBER 2012
DURATION : 2 HOURS (8.30 – 10.30 AM)

This paper consists of **FIVE (5)** pages including the front page.
Answer **FOUR (4)** questions only.

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DO NOT OPEN THIS QUESTION PAPER UNTIL INSTRUCTED BY THE CHIEF INVIGILATOR

INSTRUCTION:
This section consists of **SIX (6)** essay questions. Answer **FOUR (4)** questions only. Write your answer's in the answer booklet.

QUESTION 1

Referring to Figure 1 and using the method of joints, determine:

a) Reactions at C and D (4 marks)

b) Forces in each member of the truss with respect to

i. joint C (6 marks)

ii. joint D (6 marks)

iii. joint E (6 marks)

iv. joint A (3 marks)

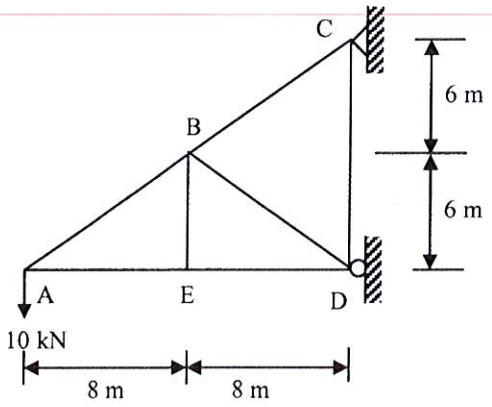

Figure 1

QUESTION 2

Determine the vertical displacement at joint D of the truss as shown in **Figure 2.** The cross section area, A of each member is 1000 mm^2 and Modulus Elasticity, E = 200 kN/mm^2. (25 marks)

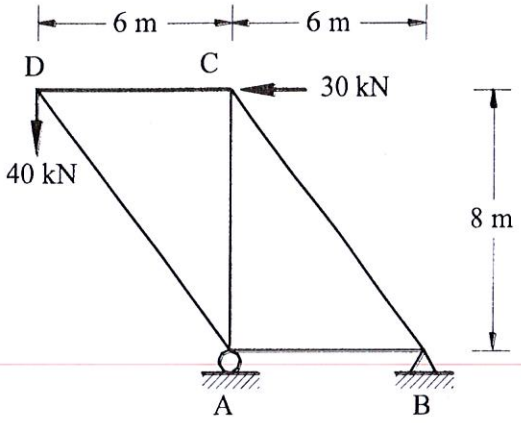

Figure 2

QUESTION 3

Determine the internal force in each member of the truss shown in **Figure 3** below. Given AE is constant and assume BE as the redundant member. (25 marks)

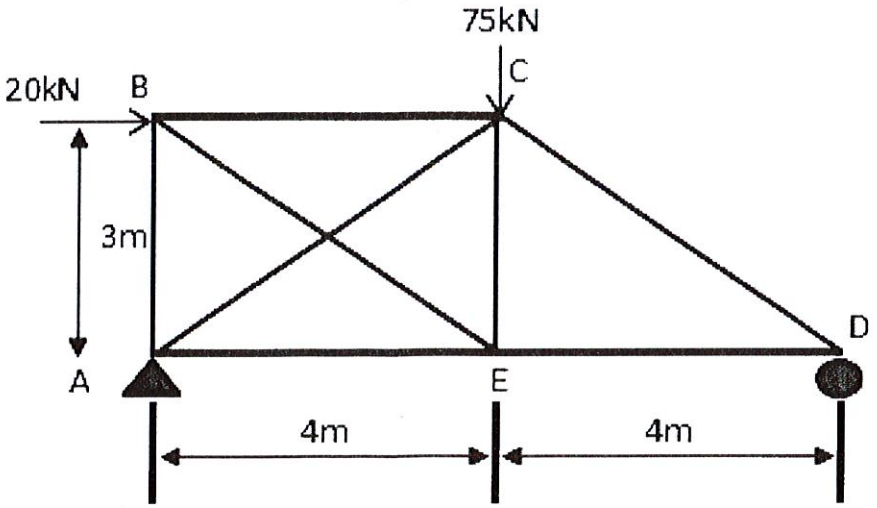

Figure 3

QUESTION 4

a) Refering to the beam in **Figure 4(a),** sketch the influence line for the:

i. vertical reaction at point B. (3 marks)

ii. vertical reaction at point D. (3 marks)

iii. shear force at point C. (3 marks)

iv. moment at point C. (3 marks)

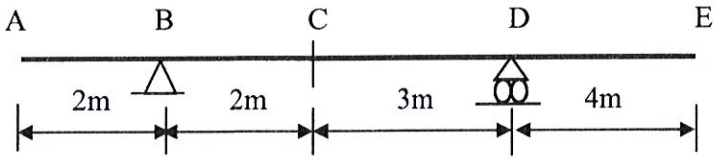

Figure 4 (a)

b) Determine the maximum shear force and maximum moment in the beam due to a series of loads moving in one direction from right to left as shown in **Figure 4(b)** below.

(13 marks)

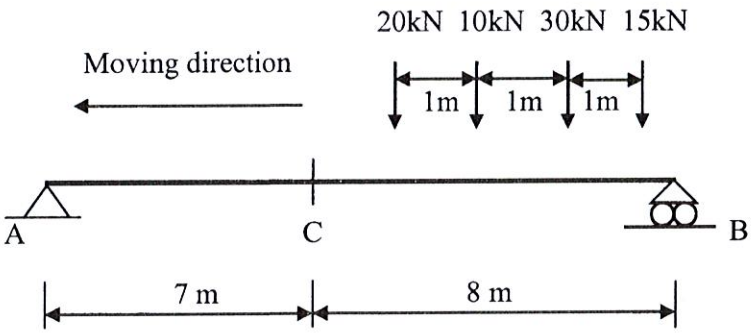

Figure 4 (b)

QUESTION 5

Determine the absolute maximum moment in the simply supported beam as given by the loading system shown in **Figure 5**.

(25 marks)

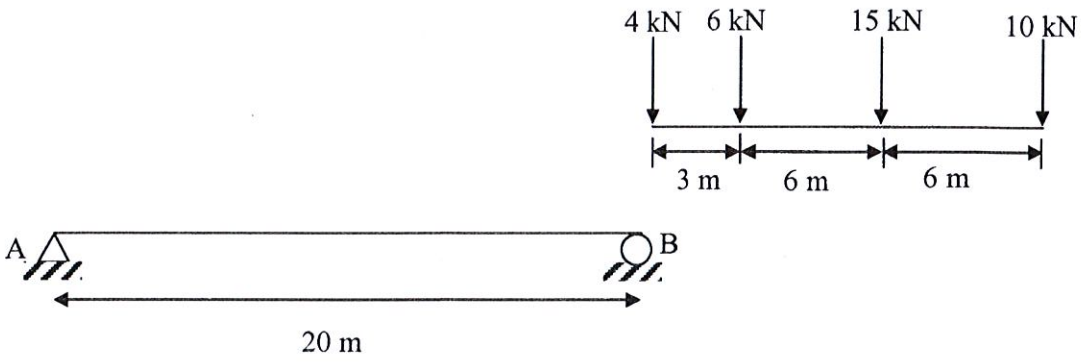

Figure 5

QUESTION 6

Refer to the **Figure 6,**

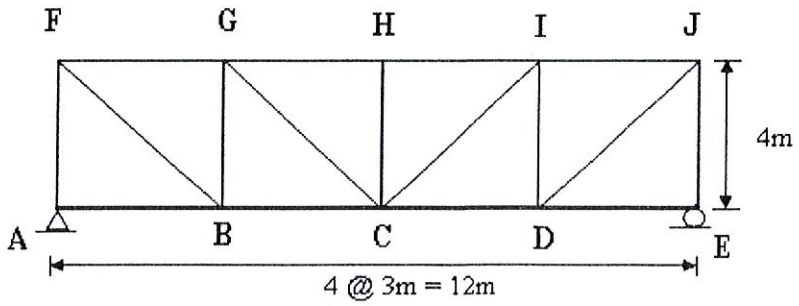

Figure 6

a) Draw the influence line for the vertical reaction at joint A and E (5 marks)

b) Draw the influence line for the force in member GC and ID (10 marks)

c) Determine the maximum force in member GC and ID due to the uniformly distribution load of 100kN/m and point load of 50kN (10 marks)