NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF THE BUILT ENVIRONMENT

DEPARTMENT OF ARCHITECTURE
BACHELOR OF ARCHITECTURAL STUDIES (HONOURS) DEGREE
2010-2011 ACADEMIC YEAR
PART I - SECOND SEMESTER EXAMINATIONS – JUNE 2011
AAR 1206 – APPLIED STRUCTURAL STATICS AND DYNAMICS II

Instructions ***Duration: 3 Hours***

Answer all questions.

QUESTION 1

(a) A steel bar 100mm x 10mm in cross section is transmitting a pull of 135 kN. Calculate the stress in the bar.

Marks 6.0

(b) A timber tension member is 100 mm square in cross section. Calculate the safe load for the timber if the permissible stress is 8 N/mm^2.

Marks 6.0

(c) A steel bar 100mm x 12mm in cross section and 3 meter long is subjected to an axial pull of 130 kN. How much will it increase in length if the modulus of elasticity E = 210kN/mm^2.

Marks 6.0

(d) Calculate the cross-sectional dimension of a square brick pier to support an axial load of 360 kN if the permissible stress for the brickwork is 1.7 N/mm^2.

Marks 7.0

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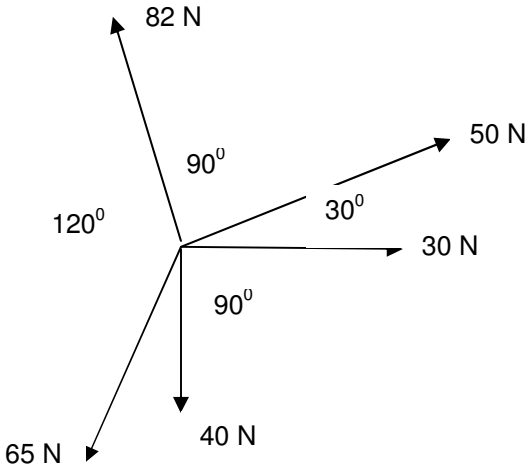
QUESTION 2

The following figure shows a system of concurrent forces acting on a body. Calculate the magnitude and direction of the resultant



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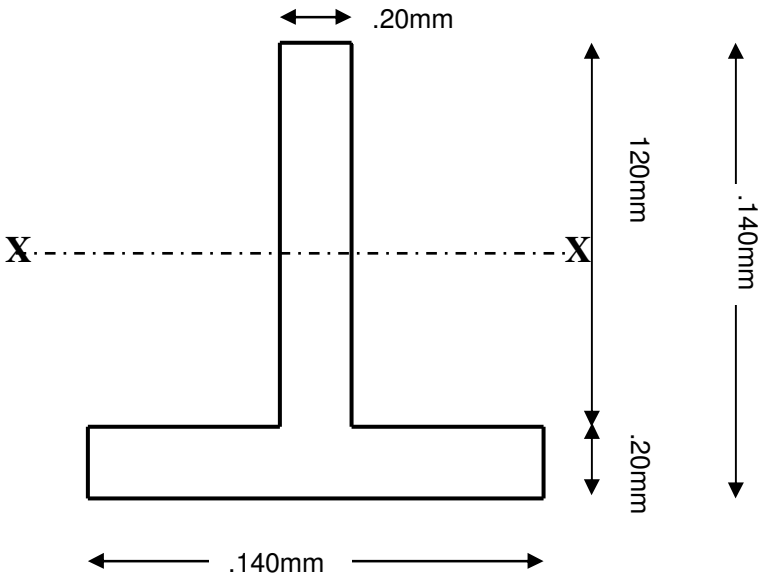
QUESTION 3

A T-section measures 140mm x 140mm x 20mm as shown in Figure Two.

Calculate I_{xx}.



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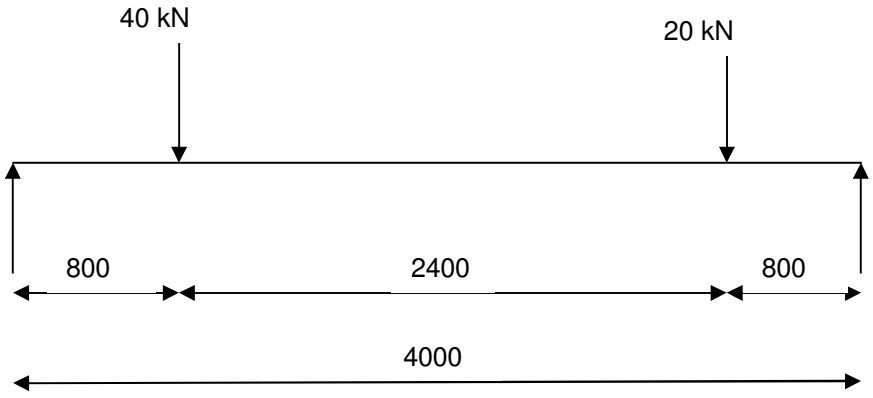
QUESTION 4

Calculate the reactions and draw the bending moment and shear force diagram of the beam shown in Figure 2.0**.**



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