NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF BUILT ENVIRONMENT
DEPARTMENT ARCHITECTURE
APPLIED STRUCTURALSTATICS AND DYNAMICS
AAR1206

Main Examination Paper

May 2015

This examination paper consists of 3 pages

Time Allowed: 3 hours

Total Marks: 100

Special Requirements: GRAPH PAPER

Examiner's Name: Eng. V.V.DESAI

INSTRUCTIONS

1. Answer all questions
2. Each question carries 25 marks
3. Use of calculators is permissible

MARK ALLOCATION

QUESTION	MARKS
1.	**25**
2.	**25**
3.	**25**
4.	**25**
TOTAL	**100**

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

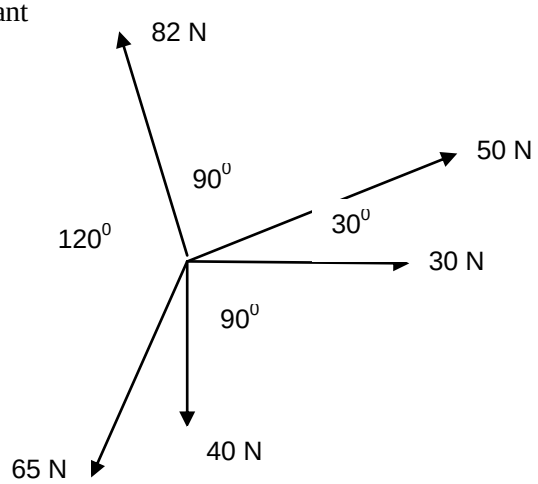
(d) Calculate the cross-sectional dimension of a square brick pier to support an axial load of 360 kN if the permissible stress for the brickwork is 1.7 N/mm^2.

Marks 7.0

TOTAL MARKS [25]

QUESTION 2

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

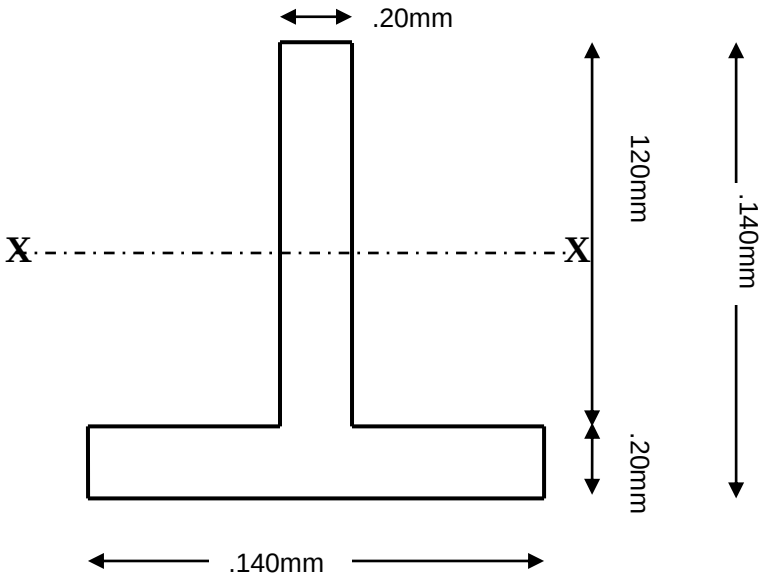


MARKS [25]

QUESTION 3

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

Calculate I_{xx}.



MARKS [25]

QUESTION 4

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