

NA TIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF THE BUILT ENVIRONMENT
DEPARTMENT OF ARCHITECTURE
BACHELOR OF ARCHITECTURAL STUDIES (HONOURS) DEGREE
2013-2014 ACADEMIC YEAR
PART I – SECOND SEMESTER EXAMINATIONS – MAY 2014
AAR 1206 – APPLIED STRUCTURAL STATICS AND DYNAMICS

Instructions

Duration: 3 Hours

Answer all questions

QUESTION 1

(a) *Figure 1.0a shows the free body diagram for the system of concurrent forces which are in equilibrium. Determine the resultant'*

(10)

(b) *If the four forces shown in Figure 1(b) are in equilibrium calculate the magnitude of force F and its direction.*

(15)

[25]

QUESTION 2

In the examples shown in Figure 2(a) and (b) calculate the net moment about point A

[25]

QUESTION 3

(a) *Calculate the direct stress in a reinforced concrete column of cross section 400mmx 350mm subjected to a compressive load of 3000 kN.*

(8)

(b) *A solid circular rod is subjected to a tensile force of 750 kN. If the permissible stress in steel is 460 N/mm² what is the minimum diameter of the rod in millimeter?*

(8)

(c) *A force is applied to a steel bar, originally 3.0 meters in length, causing it to extend by 1.5 mm. Calculate the strain in the bar.*

(9)

[25]

QUESTION 4

Calculate the I_{xx} and I_{yy} of the channel section shown in Figure 3.0.

[25]