NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF THE BUILT ENVIRONMENT

DEPARTMENT OF ARCHITECTURE
BACHELOR OF ARCHITECTURAL STUDIES (HONOURS) DEGREE

PART II END OF SECOND SEMESTER EXAMINATIONS – JUNE 2007
AAR 1206– APPLIED STRUCTURAL STATICS & DYNAMICS

Instructions ***Duration: 3 Hours***

Answer all questions.
Marks will be awarded to neatly presented work.
You can draw either in pencil or technical pen.
Number all your sheets.
Do not write your name on any sheet.

QUESTION 1

(a) Briefly describe the following terms:-

(i) Dead loads
(ii) Wind loads
(iii) Tension
(iv) Compression

[16]

(b) State and briefly describe any three types of structures.

[6]

(c) Trusses are considered more economic for long spans than beams. Explain.

[3]

QUESTION 2

(a) State the principle (law) of triangles.

[4]

(b) Define the following terms:-

(i) concurrent forces.

(ii) coplanar forces.

[4]

(c) A load of 100kg is suspended in equilibrium from two weightless strings as shown in Fig Q2 below. Find the tensions in the strings. [7]

(d)

A beam is AC is supported by a light inextensible string over a frictionless pulley as shown in Fig Q2(d) above. Determine the tension in the string and the horizontal and vertical reactions at C.

[10]

QUESTION 3

a) State the conditions of equilibrium of a rigid body.

[5]

b) Fig. Q3 below shows a truss carrying a static load. Determine the external reactions and the internal forces in all the members of the truss.

[20]

QUESTION 4

(a) For the beam given below, determine the support reactions and draw the moment and shear diagrams.

[15]

(b) Fig 4(b) show a wooden column, 15cmx10cm, cross-section and 1,8m high. Assuming a permissible stress of 6N/mm² and Young's Modulus E = 1,12x10 N/mm², calculate the safe axial load N for the column and by how much does the column shorten under this load? [10]

END OF EXAMINATION