NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF ARCHITECTURE AND QUANTITY SURVEYING

DEPARTMENT OF ARCHITECTURE
BACHELOR OF ARCHITECTURAL STUDIES (HONOURS) DEGREE

PART II SUPPLENTARY EXAMINATIONS – AUGUST 2004
AAR 2105 STRUCTURAL DESIGN I

Instructions ***Time : 3 Hours***

Answer any FOUR questions.
All questions carry equal marks.

QUESTION 1

Draw Bending Moment and Shear force diagram for the beam in Fig. 1

QUESTION 2

Calculate I_{xx} and I_{yy} about the axis passing through its centroid and parallel to the base of the Section Shown in fig. 2.

QUESTION 3

A timber Cantilever beam project 2m and carries a 6KN point load at the free end. The beam is 150mm to 250 mm, as shown in fig. 3. Calculate the stresses in the extreme fibres

a) At the support
b) At a point 1m from the support

Ignore the weight of the beam.

QUESTION 4

The symmetrically loaded beam, shown in fig. 4. Carries three loads, and the internal span *I* to be such that the negative bending moment at each support equals the positive bending moment at C, what is the span *l*? If each load W is 100 KN, choose a suitable UB (f = 165 N/mm^2).

QUESTION 5

A 152mm x 76 mm @ 19kg/m steel tee section, as shown in fig. 5, may be stressed to not more than 155 N/mm2. What safe inclusive uniform load can the section Carry as a beam spanning 2.0m between simple supports?