



School	<b>NBE</b>	Subject Area & Catalogue number	<b>CIVE 1002</b>
Course Name	<b>STRUCTURES 1</b>		

Official Reading Time: **10 Minutes**

Writing Time: **3 Hours**

Instructions to Candidates:

**This exam is worth 40% of the total course marks**

**Attempt all questions**

**Marks for each question are noted below**

**Please excuse any inaccuracies in the drawings and use the dimensions provided**

**State any assumptions made**

Permitted Materials

**'Open book', i.e. any calculator and any reference materials are allowed.**

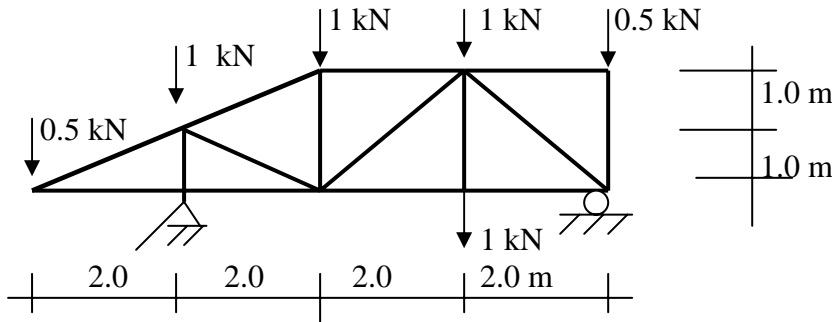
Examiner: **Stefan Hornlund**, Tel 8302 2228

Paper reviewed by: **Virginia Mehrtens**

**Question 1**

**(16 Marks)**

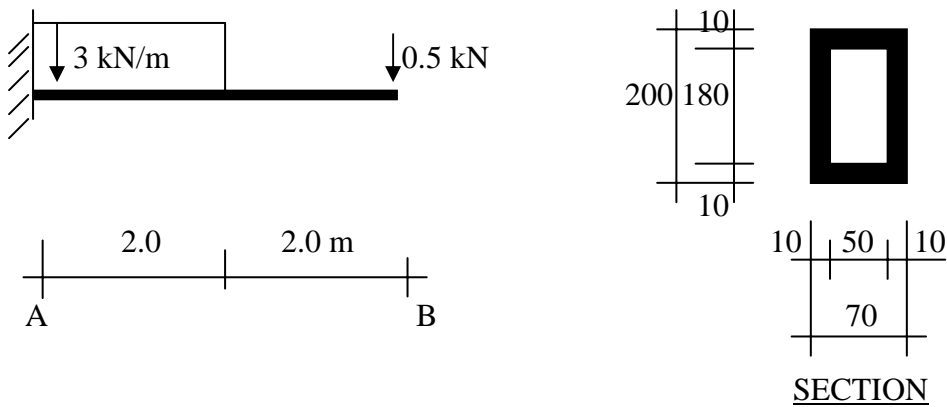
Determine the forces in all members of this loaded truss.



**Question 2**

**(10 Marks)**

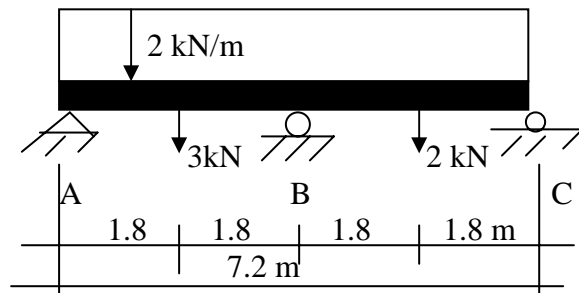
Calculate and draw the Shear Force and Bending Moment diagrams for this loaded cantilever beam. Also calculate the amount of deflection at the free end (B) of the beam if the beam cross section is a rectangular hollow steel section (on edge), as per the section drawing below, with an E-value of  $200\,000\text{ N/mm}^2$ .



**Question 3**

**(14 Marks)**

a) Calculate and draw the Shear Force and Bending Moment diagrams for this loaded continuous roof beam. Include all extreme values and any points of contra-flexure.



b) If this beam arrangement was changed to consist of two separate beams A-B and B-C, how would that effect the Bending Moment diagram(s)? Sketch the new BMD(s) and comment on the main differences. No calculations are required.

END OF QUESTIONS

DO NOT COMMENCE WRITING UNTIL INSTRUCTED TO DO SO