

**UNIVERSITY OF SOUTH AUSTRALIA**  
**SCHOOL OF GEOINFORMATICS, PLANNING & BUILDING**

PROGRAM(S): **Graduate Certificate in Building & Planning**

COURSE: **BUILDING STRUCTURES 5 (02601)**

EXAMINATION: **External Exam, Semester 1, 2001**

DURATION: **3 Hours of Exam time preceded by 10 minutes of Reading time, a total of 3 Hrs 10 Mins.**

EXAMINER: **Stefan Hornlund, Tel 08 - 8302 2228**

**INSTRUCTIONS TO CANDIDATES:**

- This exam is worth 40% of the total course marks
- Attempt all questions
- All questions are of equal value
- Any Reference materials are allowed. Calculator is allowed.
- State any assumptions made

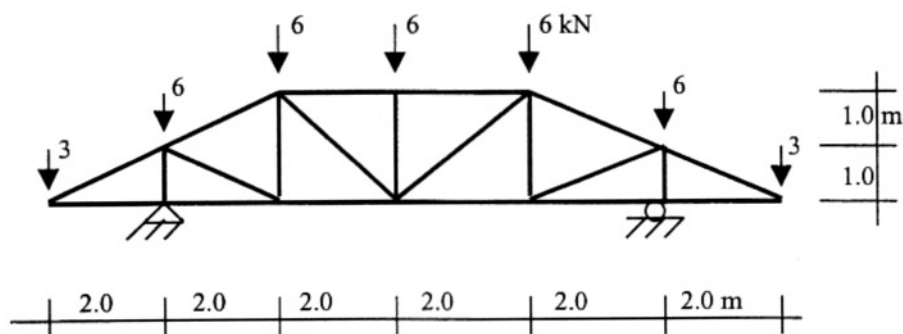
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**NOTES FROM EXAMINER:**

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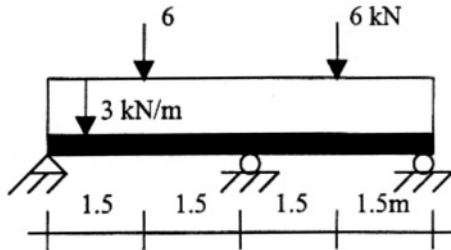
**Question 1**

Calculate the forces in all members of this loaded, pin-connected, truss.



### Question 2

- Calculate and draw the Shear Force and Bending Moment Diagrams for this loaded beam. Include all maximum values and all points of contraflexure.
- Determine the minimum required beam size, based on bending stress only, if the beam material has a maximum permitted bending stress of  $F_b = 8\text{MPa}$  and the width of the beam must be 75 mm.



### Question 3

- Calculate and draw the bending moment diagram for this loaded 3-pin frame (pin-connections at A, C and E). Include all maximum values and any points of contra-flexure.
- If the ridge connection (C) was made rigid, the frame would become a statically indeterminate 2-pin frame. Sketch how you think the new BMD would look (no calculations required) and comment on if/how you think the maximum bending moment would change.

