



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T140(E)(A12)T

NATIONAL CERTIFICATE

BUILDING AND STRUCTURAL CONSTRUCTION N5

(8060015)

12 April 2019 (X-Paper)
09:00–13:00

OPEN-BOOK EXAMINATION

REQUIREMENTS: ONE A2 drawing sheet
Hot-rolled structural steel sections (BOE 8/2)

This question paper consists of 7 pages and 1 formula sheet.

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
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TIME: 4 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
 2. Read ALL the questions carefully.
 3. Number the answers according to the numbering system used in this question paper.
 4. Draw a 20 mm border line around the DRAWING SHEET on both sides.
 5. Use only pencil on the DRAWING SHEET.
 6. Use both sides of the DRAWING SHEET.
 7. Draw ALL drawings according to the required scale.
 8. Round off calculations to THREE decimal places.
 9. Use your discretion where dimensions are NOT given.
 10. Write neatly and legibly.
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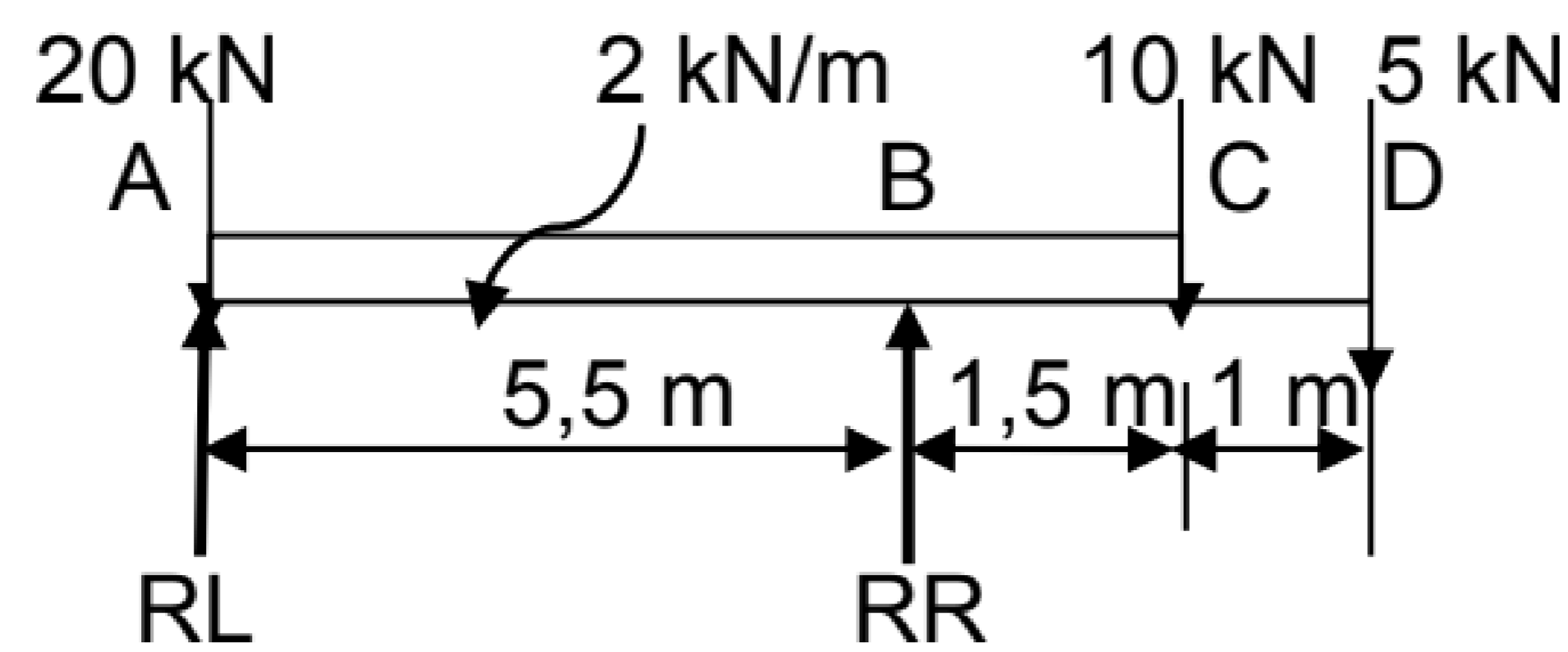
SECTION A**QUESTION 1: LOADED BEAM****FIGURE 1**

FIGURE 1 shows a simple supported beam.

- 1.1 Calculate the reactions RL and RR. (4)
- 1.2 Calculate the shear-force values and draw to a suitable scale a shear-force diagram. (8)
- 1.3 Calculate the maximum bending-moment values and draw to a suitable scale a bending-moment diagram. (4)

[16]**QUESTION 2: SELECT STEEL BEAM**

The maximum bending moment and maximum shear force of a loaded simple supported beam are 29,75 kN/m and 18 kN respectively. Select from the hot-rolled structural steel sections (BOE 8/2) a suitable I-section with tapered flange if the maximum bending stress may NOT exceed 165 MPa.

- 2.1 Calculate the section modules. (4)
- 2.2 Investigate the safety factors. (4)

[8]