higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

BUILDING AND STRUCTURAL CONSTRUCTION N5

(8060015)

23 November 2020 (X-paper)
09:00–13:00

REQUIREMENTS: **Answer book (8/13)**
A2 drawing sheet
Hot-rolled steel sections (BOE 8/2)

Non-programmable calculators may be used

This question paper consists of 5 pages, 1 formula sheet and 1 addendum.

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
BUILDING AND STRUCTURAL CONSTRUCTION N5
TIME: 4 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Read all the questions carefully.

2. Answer all the questions and write legibly.
   QUESTIONS 1, 2 and 5 must be done on the supplied DRAWING SHEET.
   QUESTIONS 3 and 4 must be done in the ANSWER BOOK.
   QUESTION 6 must be done on ADDENDUM A (attached).

3. Number the answers according to the numbering system used in this question paper.

4. All drawings must be done in pencil with bold outlines.

5. The drawings must be done in accordance with the National Standards and must be fully labelled with descriptive notes and dimensions (where applicable).

6. All calculations must conform to the relevant SABS / SANS Code of Practice.

7. Write neatly and legibly.

QUESTION 1

FIGURE 1 shows the front view of a steel frame, with overhangs on both sides, to allow for passageways on both sides of the building.

Calculate the forces in the TWO reactions then use the graphical method to obtain the magnitude and direction of the forces in each of the members to distinguish between tension and compression forces.

This question must be answered on the supplied A2 DRAWING SHEET.

Use the following scales: Space diagram: 140 mm = 10 m
Vector diagram: 3 mm = 1 Kn

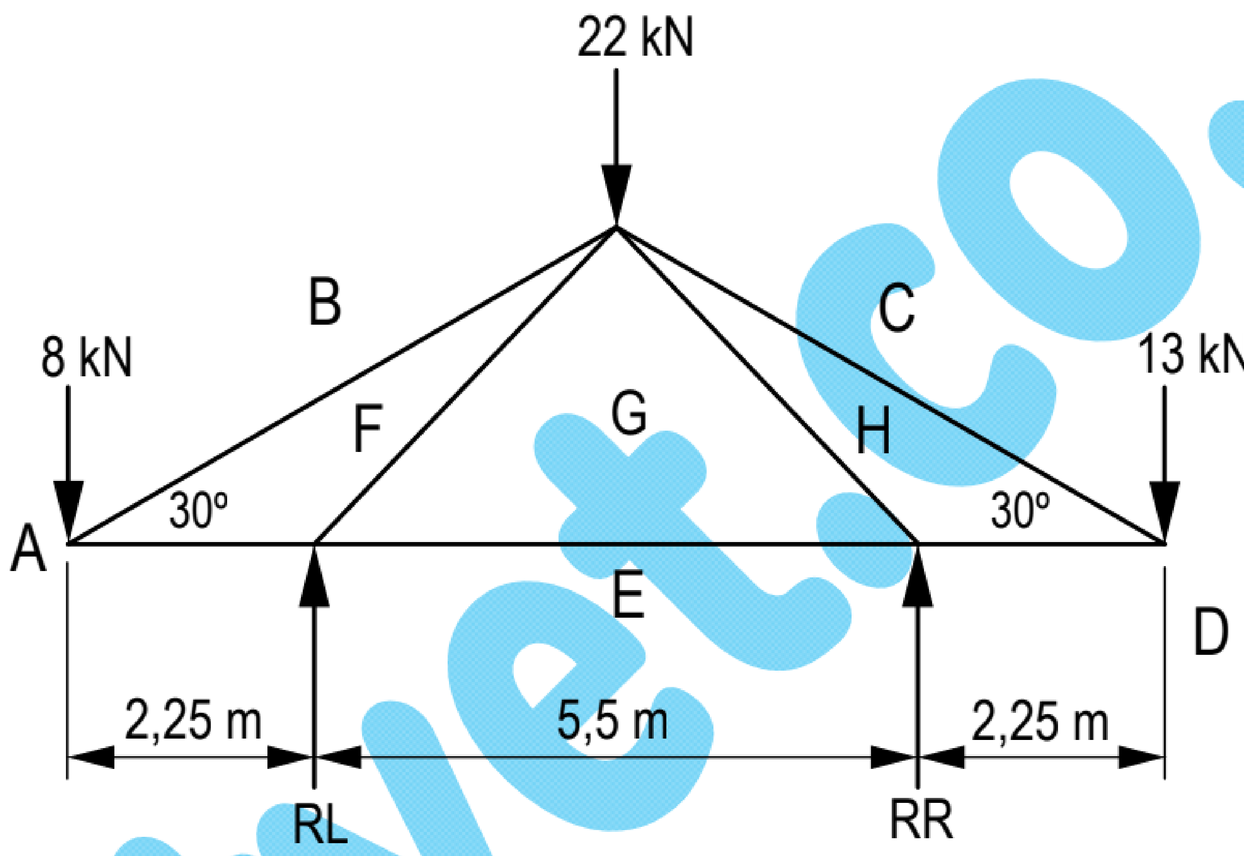

FIGURE 1

Indicate the struts and ties on the front view. Tabulate your answers. **[17]**

QUESTION 2

Use scale 1:5 to draw the longitudinal sectional front view of a steel staircase, including the foot of the staircase. The top of the first step is 175 mm above floor level and the rise and tread is 175 mm and 305 mm respectively. The staircase has open risers with the going of 280 mm.

The 305 × 50 mm thick timber treads are supported by 50 × 50 × 6 rolled steel angles which are welded to the outside of a 280 × 95 × 41,8 kg/m channel. The front edge of the tread is 15 mm below the top edge of the channel.

The completed drawing must be fully labelled and dimensioned. Show the positions of the floor level as well as the 6 mm welding symbol between the angle and channel. **[15]**

