higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

CONSTRUCTION PLANNING
NQF LEVEL 2

(12010042)

8 November 2018 (X-Paper)
09:00–12:00

This question paper consists of 7 pages.

NCV

TIME: 3 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. Do drawings, sketches and diagrams in pencil.
5. Sketches and diagrams must be neat, reasonably large, in proportion and fully labelled.
6. Rule off across the page after each completed question.
7. Clearly cross out ALL work you do NOT want to be marked.
8. ALL abbreviations and symbols must comply with the latest National Building Regulations and all relevant SANS (SABS) codes.
9. Write neatly and legibly.

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QUESTION 1: TERMINOLOGY AND COMPONENTS OF THE CONSTRUCTION INDUSTRY

1.1 List any THREE different materials to be used by a bricklayer in the building industry. (3 × 1) (3)

1.2 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (1.2.1–1.2.2) in the ANSWER BOOK.

1.2.1 Most clients will choose a registered home builder to build their dwelling to the approved building standards.

1.2.2 The national building regulations are the rules which must be adhered to by all builders in South Africa.

(2 × 1) (2)
[5]

QUESTION 2: MEASURING, SETTING OUT AND LEVELLING

2.1 Explain the following terms:

2.1.1 Builder's square

2.1.2 Optical square

2.1.3 Plumb bob

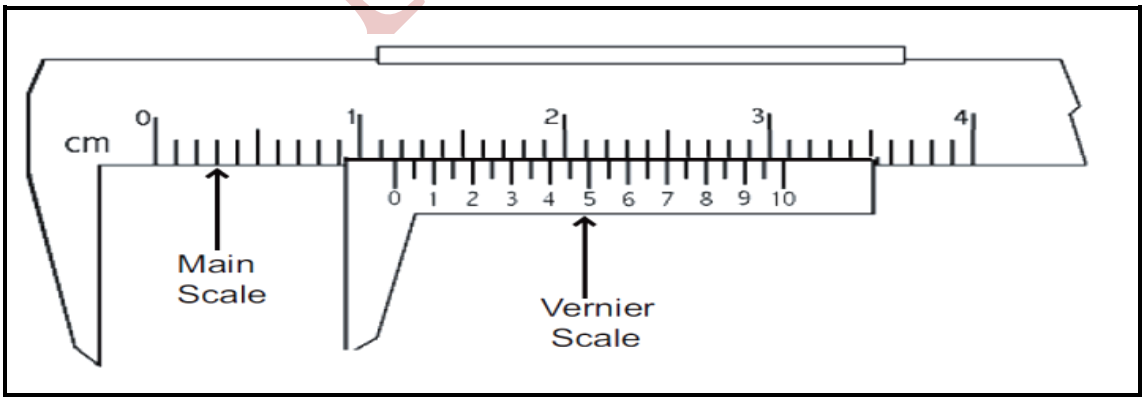
2.1.4 Error of parallax

(4 × 2) (8)

2.2 Explain the setting out of a right angle (90°) using the Pythagoras theorem or 3:4:5 method. (4 × 1) (4)

2.3 Briefly explain the correct way of using a measuring tape. (5 × 1) (5)

2.4 Study the Vernier calliper in FIGURE 1 below and give the reading on the Vernier scale.



(2)

FIGURE 1

2.5 Briefly describe the construction activities on a building site indicated by the following building terms:

2.5.1 In situ

2.5.2 Excavation

2.5.3 Setting out

(3 × 2) (6)
[25]

QUESTION 3: INTERNATIONAL SYSTEM (SI) UNITS OF MEASUREMENTS

3.1 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (3.1.1–3.1.5) in the ANSWER BOOK.

3.1.1 1 000 pounds is equal to 400 kg.

3.1.2 The unit of density is kilograms per cubic meter (kg/m^3).

3.1.3 The SI unit of force is Newton.

3.1.4 The symbol for energy is N.

3.1.5 Thermodynamics involves the relationship between heat and other forms of energy.

(5 × 1) (5)

3.2 A car has travelled a distance of 200 km in 2 hours.

Calculate the velocity of the car in m/s. Show ALL calculations and units. (3)

3.3 Convert 3 km to mm. Give the answer in scientific notation. (2)
[10]

QUESTION 4: FOUNDATIONS

4.1 What is the purpose of having a foundation in a building? (2)

4.2 The soils on which construction buildings are founded differ from region to region.

Name the foundations suitable for each description of a soil type below:

4.2.1 Commonly used for houses where part of the house is going to be built on good ground and part of it on poor ground

4.2.2 Commonly used in multi-level houses built in problem soil

4.2.2 Commonly used for single-level houses on good and solid soil

4.2.4 Reinforced concrete slab covering the foundation and floor surface suitable for single-level houses on poor and unstable soil.

(4 × 2) (8)
[10]

QUESTION 5: AREA AND VOLUME

5.1 A half-brick wall with dimensions of 8 m × 5 m must be built in the garden. The size of the brick is 222 mm × 72 mm.

5.1.2 Calculate the area of the garden wall. (1)

5.1.2 Calculate the number of bricks required to build the half brick garden wall. (4)

5.2 A square bedroom has one-brick walls. The dimensions of one wall is 6 m × 3 m. The room has two doors of 1,2 m × 2 m each and three windows of 2 m × 2 m each.

Calculate the volume of paint needed to paint the inside of the room if the application rate of the paint is 8 m² per litre. (5)
[10]

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QUESTION 6: TECHNICAL DRAWINGS

6.1 Different symbols and abbreviations are used in architect's drawings.

Draw the symbols that represent the following items:

6.1.1 Earth fill

6.1.2 Finished wood

6.1.3 Water closet pan

6.1.4 North point

6.1.5 Staircase

(5 × 1) (5)

6.2 Engineering drawings are drawn by an engineer to go with the architects plans.

Briefly explain the use of the following drawings:

6.2.1 Site plan

6.2.2 Sections

6.2.3 Steel fixers

(3 × 2) (6)

6.3 A plan of a room is drawn to a SCALE of 1:400. The one side of the room on the plan is 8 mm and the other side is 6 mm.

Calculate the actual area of the room. (4)

[15]

QUESTION 7: BEHAVIOUR OF STRUCTURES

7.1 Define the following building terms:

7.1.1 Simply supported beam

7.1.2 Cantilever beam

7.1.3 Neutral axis

7.1.4 Tie

7.1.5 Strut

(5 × 2) (10)

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7.2 Give the names of the following construction structure members:

7.2.1 The length is 10 or more times the width

7.2.2 Pin-jointed frames in two dimensions only

7.2.3 Pin-jointed frames in three dimensions that have depth

7.2.4 The length is less than 10 times the width

(4 × 1) (4)

7.3 A load is a force that is applied to a specific area of a structure or to the structure as a whole.

Give FOUR examples of natural forces that can act on a structure. (4)

7.4 FIGURE 2 below shows a well-built semi-circle arch.

Name the SEVEN parts of the arch. Write only the answer next to the question number (7.4.1–7.4.7) in the ANSWER BOOK.

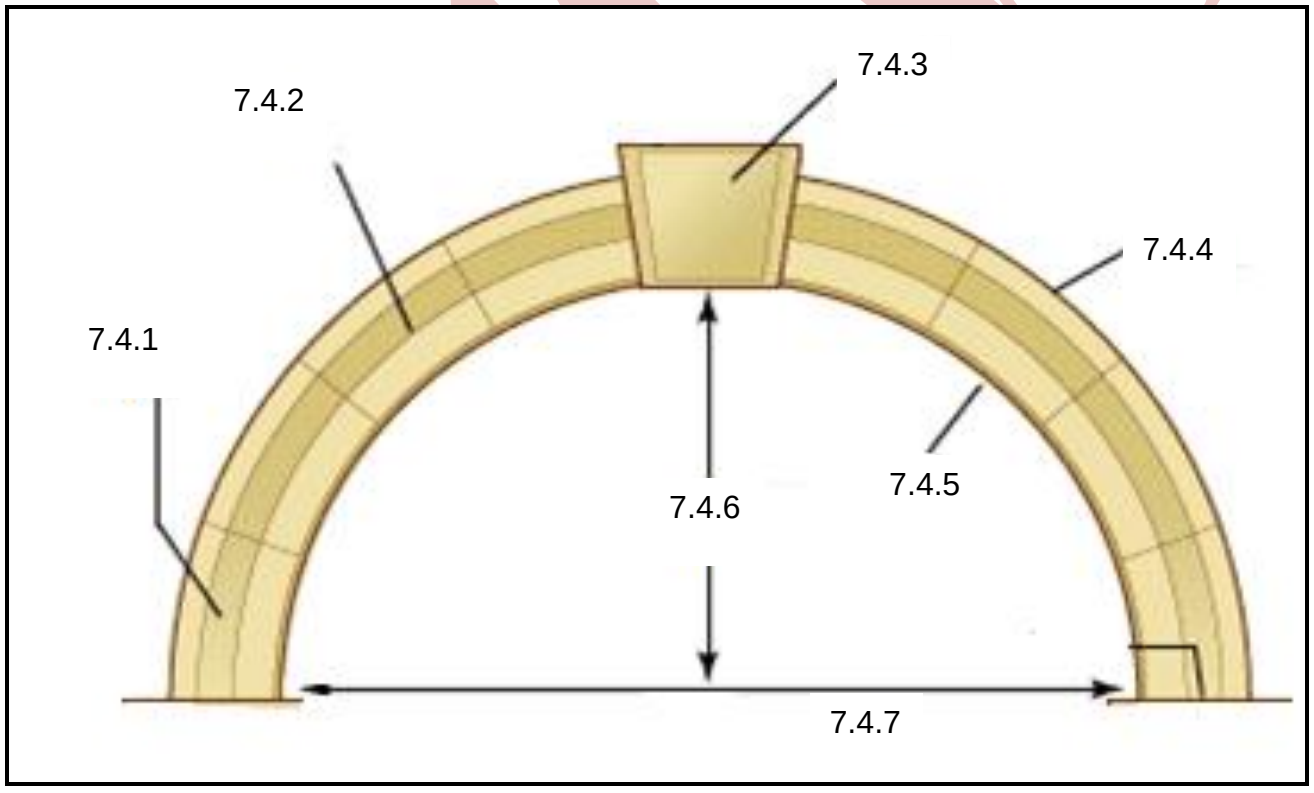

FIGURE 2

(7 × 1) (7)
[25]

TOTAL: 100

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