higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

CONSTRUCTION PLANNING
NQF LEVEL 2

(12010042)

10 November 2022 (Y-paper)
13:00–16:00

This question paper consists of 7 pages.

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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. Start each question on a new page.
5. Use only a black or a blue pen.
6. Write neatly and legibly.

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QUESTION 1: TERMINOLOGY AND COMPONENTS OF THE CONSTRUCTION INDUSTRY

1.1 Define the following:

1.1.1 Deviation

1.1.2 Tolerance

1.1.3 Variation

(3 × 1) (3)

1.2 Choose ONE term for each of the following descriptions by choosing a word(s) from the list below. Write only the answer next to the question number (1.2.1–1.2.2) in the ANSWER BOOK.

cavity wall; gable; competent person; servitude

1.2.1 The triangular side wall of a building with a pitched roof.

1.2.2 A person(s) who is qualified by virtue of his/her experience and training.

(2 × 1) (2)

[5]

QUESTION 2: MEASURING, SETTING OUT AND LEVELLING

2.1 Briefly explain how one can avoid measuring errors when using a tape measure. (5 × 1) (5)

2.2 Complete the following sentences by choosing the correct word from those in brackets. Write only the answer next to the question number (2.2.1–2.2.6) in the ANSWER BOOK.

A spirit level is a very basic 2.2.1 (measuring/levelling) instrument. It has a 2.2.2 (see/faint) through section in the middle called a 2.2.3 (point/vial) which is filled with 2.2.4 (sand/liquid). The 2.2.5 (chip/bubble) will be in the 2.2.6 (middle/side) if the surface is level.

(6 × 1) (6)

2.3 Show your understanding of construction terminology by defining the following:

2.3.1 Benchmark

2.3.2 Levelling

2.3.3 Tripod

(3 × 2) (6)

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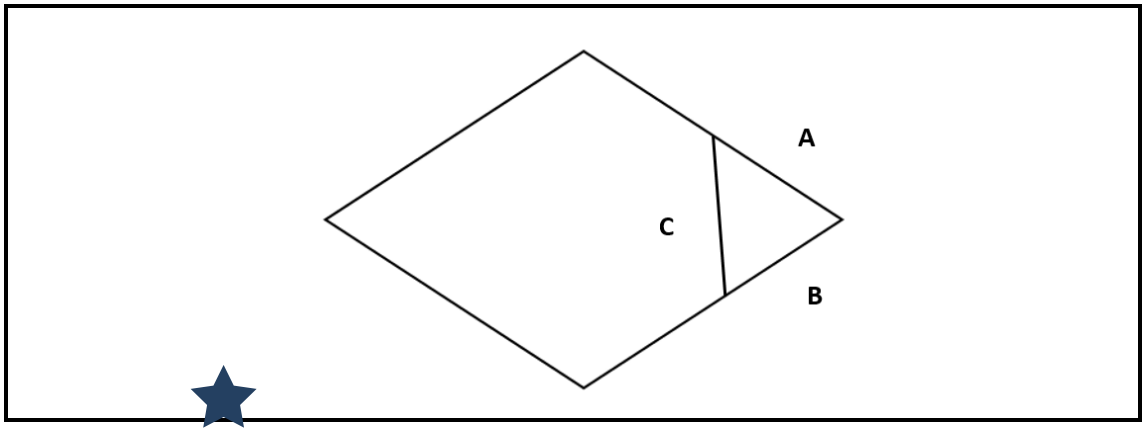
2.4 Briefly explain how a levelling instrument is used to measure horizontal distance. Assume that the level is already set up and ready to take readings.

(5 × 1) (5)

2.5 The figure below shows early stages of setting out of a house. Show your understanding of the 3-4-5 method by providing the values of the 3 sides, A, B and C.



(3 × 1) (3)

[25]

QUESTION 3: FOUNDATIONS

3.1 State THREE functions of foundations. (3)

3.2 Name the type of foundation that you would advise to be used under each of the following situations:

3.2.1 When the ground is soft and contains a lot of clay.

3.2.2 When an existing foundation is not strong enough to support a structure.

3.2.3 When a normal small house needs to be built.

(3 × 1) (3)

3.3 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (3.3.1–3.3.3) in the ANSWER BOOK.

3.3.1 An auger is a tool that is used to make a hole in the ground.

3.3.2 A piling rig is used to construct deep foundations.

3.3.3 To compact soil simply means to make it loose and workable.

(3 × 1) (3)

3.4 Name the instrument or device used by a geotechnical engineer to measure the strength of ground conditions. (1)

[10]

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QUESTION 4: BEHAVIOUR OF STRUCTURES

4.1 Various options are given as possible answers to the following sentences. Choose the correct answer and write only the letter (A–C) next to the question number (4.1.1–4.1.6) in the ANSWER BOOK.

4.1.1 A/An … load is a load that is not exactly in the centre of the column.

A eccentric
B elliptical
C gravitational

4.1.2 The … is a value in millimetres or centimetres that indicates the strength or stiffness of a column.

A dimensional measure
B radius of gyration
C axial load

4.1.3 The … length of a column means the amount of support it gives, and is not at all related to its actual length.

A total
B compressed
C effective

4.1.4 … is a type of response to compressive stress.

A Buckling
B Bulking
C Bulging

4.1.5 A/An … load is being applied along the axis of the column.

A elliptical
B axial
C gravitational

4.1.6 The … ratio gives a measure of the column's ability to resist buckling.

A gravitational
B critical
C slenderness

(6 × 1) (6)

4.2 Snow is an example of a force that act on an engineering structure.

Name any other FOUR forces that act on engineering structures. (4 × 1) (4)

4.3 Name FOUR shapes of arches that are commonly used. (4 × 1) (4)

4.4 Give the definition of a *strut* in engineering structures. (2)

4.5 Briefly explain what a uniformly distributed load is. (3)

4.6 Complete the following paragraph on pin-jointed frame structures by choosing a word from the list below. Write only the word(s) next to the question number (4.6.1–4.6.6) in the ANSWER BOOK.

roof trusses; dams; bridges; tensile; compressive; length; axial; deficient; effective

A pin-joined frame is a structure made up of slender members joined to each other at their ends. These frames are used for (4.6.1) ... and (4.6.2) ... and the arrangement of the members is such that they carry only axial forces. Remember that an/a (4.6.3) ... force acts along the (4.6.4) ... or axis of the member. This force may be (4.6.5) ... or (4.6.6) ... .

(6 × 1) (6)
[25]

QUESTION 5: INTERNATIONAL SYSTEM (SI) UNITS OF MEASUREMENTS

5.1 Explain why it was important to standardise measurements by creating the International System (SI) of Units in 1960. (2)

5.2 Add 12 minutes and 25 seconds to 1 hour, 55 minutes and 42 seconds.
Give the answer in hours, minutes and seconds. (3)

5.3 Convert 144 500 grams to kilograms. (1)

5.4 What are the units of measurements used for the following quantities?

5.4.1 Fuel in a car's petrol tank.

5.4.2 Electricity used in a household.

5.4.3 The volume of concrete needed to cast a slab.

5.4.4 The storage capacity of a cell phone.

(4 × 1) (4)
[10]

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QUESTION 6: AREA AND VOLUME

6.1 The walls of a bedroom must be covered with wallpaper. The dimensions of the room are 6, 2 m × 4, 0 m and 2 700 mm high. One roll of paper contains 3,5 m². How many rolls of paper are needed to cover the walls of the room?

NOTE: Do not consider doors and windows. (5)

6.2 How many tiles are needed to tile a floor of a room 6,2 m in length and 5,5 m wide?

The size of the tiles is 350 mm × 350 mm. (5)

[10]

QUESTION 7: TECHNICAL DRAWINGS

7.1 Briefly describe the procedure to follow when drawings are revised. (5 × 1) (5)

7.2 Technical drawings use different types of lines to convey different meanings.

Name FIVE different types of lines used in technical drawings. (5)

7.3 Write the following abbreviations in full:

7.3.1 BIC

7.3.2 RWP

7.3.3 WC

7.3.4 NTS

7.3.5 IC

(5 × 1) (5)

[15]

TOTAL: 100

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