higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ARCHITECTURAL GRAPHICS AND TECHNOLOGY

(Second Paper)

NQF LEVEL 2

(12050622)

20 November 2018 (X-Paper)
09:00–12:00

Calculators may be used.

This question paper consists of 7 pages.

NCV

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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. Do ALL drawing work, including candidate information, in pencil.
5. ALL drawing work must comply with the relevant SANS (SABS) recommended codes.
6. ALL abbreviations and symbols must comply with the latest National Building Regulations and ALL relevant SANS (SABS) codes.
7. A balanced layout is very important and candidates will be penalised for poor planning.
8. Sketches and/or diagrams must be neat, reasonably large, in proportion and fully labelled.
9. Write neatly and legibly.

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QUESTION 1: GENERAL

1.1 Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (1.1.1–1.1.10) in the ANSWER BOOK.

1.1.1 Architectural working drawings must comply with …

A National Building Regulations and local authority regulations.
B local authority regulations only.
C National Building Regulations only.
D NHBRC regulations only.

1.1.2 When drawing reinforced-concrete slabs and beams, a draughtsperson must be advised by a …

A structural engineer.
B land surveyor.
C quantity surveyor.
D building contractor.

1.1.3 The … works out how much a contractor must be paid at agreed intervals.

A Land surveyor
B Quantity surveyor
C Structural engineer
D Building contractor

1.1.4 The abbreviation CE on building plumbing drawings is used when identifying …

A cat's eyes.
B cleaning eyes.
C cooling elements.
D cover elevations.

1.1.5 Set of drawings used by the builder when building drawings are issued for construction:

A Rough-draft sketches
B Rendered-marketing drawings
C Sketch plan set
D Working-drawing sketch

1.1.6 The … determines the cost of the overall project.

A Building inspector
B Staff officer
C Quantity surveyor
D Land surveyor

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1.1.7 Shallow foundations are founded at a depth less than …

A 3,5 m.
B 3 m.
C 3,8 m.
D 4 m.

1.1.8 The following brick-masonry term is now outdated:

A One-brick wall
B Single-leaf walls
C Brick-wall elevation
D Cavity walls

1.1.9 A precast commercial lintel over an opening wider than 3 m must be designed by a/an …

A structural engineer.
B geotechnical engineer.
C draughtsperson.
D architect.

1.1.10 The individual wedge-shaped bricks in an arch:

A Soffit
B Crown
C Voussoirs
D Intrados

(10 × 2) (20)

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 (1.2.1–1.2.10) in the ANSWER BOOK.

1.2.1 Detail drawings, working drawings and schedules are all needed to create a set of plans that building contractors can easily build from.

1.2.2 If there is a possibility of misunderstanding an abbreviation on a working drawing it is best to write the description in full.

1.2.3 Green is used to show new masonry on a drawing.

1.2.4 Elevations help to interpret the layout of a plan.

1.2.5 One of the benefits of using a stop to cut multiple lengths of material is that the tape does not get tangled or bent when you are using it.

1.2.6 A theodolite is used to measure horizontal and vertical angles.

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1.2.7 The function of a foundation is to evenly distribute the load it carries to the soil that supports the foundation.

1.2.8 When setting out large arcs or arches one can set up a rigid bar as a radius arm by using various materials found on-site, like timber or boarding.

1.2.9 The most common material used for modern day lintels is timber.

1.2.10 The axed brick arch does not need to be carefully set out.

(10 × 1) (10)

1.3 Complete the following sentences by using the words in the list below. Write only the missing word or words next to the question number (1.3.1–1.3.7) in the ANSWER BOOK.

building line; SANS 10400; SANS 40010; 3-4-5; 5-3-4; Egyptians; Romans; quoins; laser; closer; soffit; crown

1.3.1 A ... indicates the furthest boundary of a building restriction area from the street or any boundary of a property. It is normally a fixed distance from the boundary of a property. (1)

1.3.2 ... is the code of practice for the application of national building regulations. (1)

1.3.3 The limitations of using the ... method to set shapes are that the triangle can be dropped and broken. (1)

1.3.4 The ... started making bricks in different colours and the ... introduced new brick-making techniques learned from their travels. (2)

1.3.5 The following terms are associated with masonry or brickwork: ... and ... (2)

1.3.6 The following terms are associated with the construction of arches: ... and ... (2)

1.3.7 You can use a distance ... in place of a tape measure. (1)

[40]

QUESTION 2: TERMINOLOGY AND COMPONENTS OF THE CONSTRUCTION INDUSTRY

2.1 Name TWO green-design pillars. (2)

2.2 Give TWO objectives of green building or green design. (2)

2.3 Explain *property servitude*. (2)

2.4 Name TWO items in a contract. (2)

2.5 Differentiate between *black water* and *grey water*. (1 + 1) (2)
[10]

QUESTION 3: MEASURING, SETTING OUT AND LEVELLING

3.1 List FIVE basic types of measuring equipment used in the building and construction industry. (5)

3.2 Explain how to measure successive intervals from the zero mark. (5)

3.3 Explain the concept of *setting out*. (4)

3.4 List and describe THREE setting-out instruments. (3 × 2) (6)
[20]

QUESTION 4: FOUNDATIONS

4.1 Explain THREE working principles of each of the following shallow foundations:

4.1.1 Strip foundation

4.1.2 Pad foundation

4.1.3 Raft foundation

4.1.4 Buoyed-up foundations

(4 × 3) (12)

4.2 Give THREE dangers of founding a structure on an unconsolidated fill or a fill that is not suitably compacted. (3)
[15]

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QUESTION 5: BRICKWORK, LINTELS AND ARCHES

5.1 Briefly explain the history of bricks and concrete masonry units. (3)

5.2 Define each of the following masonry terms:

5.2.1 Wall ties

5.2.2 Stretcher course

5.2.3 Soldier course

(3 × 2) (6)

5.3 Define each of the following arch terms:

5.3.1 Extrados

5.3.2 Soffit

5.3.3 Keystone

(3 × 2) (6)

[15]

TOTAL: 100

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