higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

DRAWING OFFICE PROCEDURES AND TECHNIQUES

(First Paper)

NQF LEVEL 2

(12050702)

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

This question paper consists of 7 pages and 3 addenda.

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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. The drawings, sketches and diagrams must be done in pencil.
5. Freehand drawings, sketches and/or diagrams must be neat, reasonably large, in proportion and fully labelled.
6. ALL the abbreviations and symbols must comply with the latest National Building Regulations and all relevant SANS (SABS)-codes.
7. Write neatly and legibly.

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QUESTION 1: DRAWING OFFICE ORIENTATION

Read the following questions carefully and complete on the ANSWER BOOK:

1.1 Draughting is a basic form of graphic communication.

What is meant by *communication in the draughting environment*? (2)

1.2 Name FOUR typical occupations or careers in the draughting industry. (4)

1.3 Name FIVE skills and/or tools designer should have. (5 × 2) (10)

1.4 What is the name of the draughtsperson who invented orthographic projection? (1)

1.5 Name TWO of the sixteen professional bodies by writing it in the ANSWER BOOK. (2)

[19]

QUESTION 2: DRAWING OFFICE STANDARDS AND SPECIFICATIONS

2.1 Draughtspersons must take good and proper care of their specialised precision drawing instruments and equipment to ensure that it remains effective and precise.

Name FIVE measures to be applied in the caring of a pencil/clutch pencil. (5)

2.2 All engineering drawings should have a border around the edge of the drawing sheet.

Give the border sizes to be used on each of the following A sizes

2.2.1 A0

2.2.2 A1

2.2.3 A2

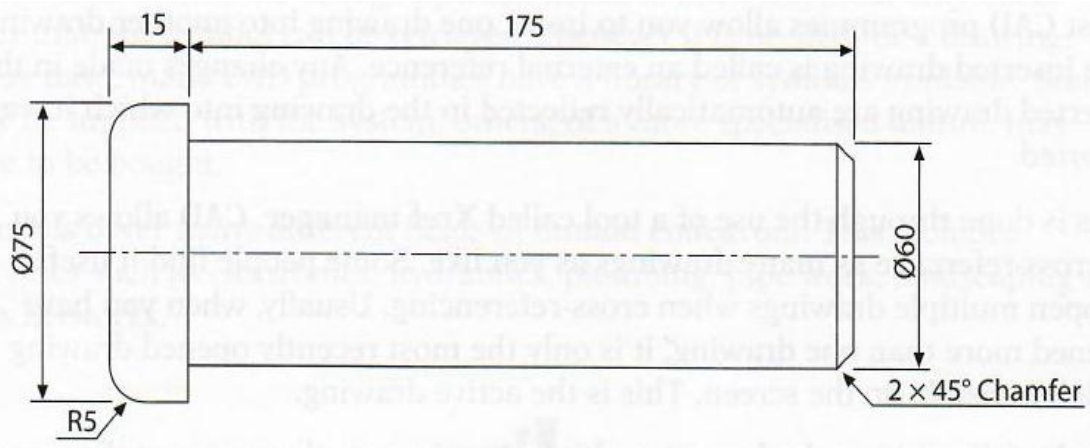
2.2.4 A3

2.2.5 A4

(5 × 1) (5)

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2.3 Make a freehand drawing in good proportion of a spindle, as shown, using the block on ADDENDUM A (attached).



(8)
[18]

QUESTION 3: DRAWING OFFICE LAYOUT AND EQUIPMENT

3.1 Polyester film is increasingly the preferred drawing material to be used in the drawing office.

Name SIX advantages of polyester film. (6)

3.2 Drawings are normally filed in an organised way and in accordance with a filing system, comprising some sort of indexing and drawing number system.

The drawing number that appears in the bottom right-hand corner of the drawing sheet is used to easily file and retrieve a drawing.

Name FOUR ways of numbering or assigning letters to drawings. (4)

3.3 List SEVEN sections of a technical report. (7)

3.4 Microfilming, also known as microfiche, is a reduction process whereby engineering drawings is copied on film.

Name ONE way to access the engineering drawing from the microfilm. (1)
[18]

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QUESTION 4: PRINCIPLES OF VISUALISATION AND PERCEPTION

4.1 Make ONE freehand drawing on ADDENDUM B (attached), from the written brief of a client. The brief requires you to create a freehand drawing a machine block to be used as a milling jig.

The block size is 135 mm in length, 125 mm in width and is 75 mm thick. A series of holes must be positioned on the face of the block as follows:

- A 75 mm diameter hole must be marked off in the centre of the block.
- Four 20 mm holes need to be marked off. The holes is set 25 mm in from each corner.
- Insert all the dimensions on the drawing. (6)

4.2 Make ONE freehand drawing on ADDENDUM C (attached), from the written brief of a client. The brief requires a freehand drawing of a bathroom.
The building contractor responsible for building the bathroom you drew a floor plan for, requested you to come on site and make changes to the drawing.
The changes are:

4.2.1 Reduce the size of the window. A 1 500 × 1 200 mm window is rather large for a bathroom, particularly when the wall in which it goes is only 2000 mm long. This leaves only 150 mm of wall either side of the window. The window overlaps the bath by 500 mm.

4.2.2 Based on the current drawing, the basin is going to be installed under the window. Most people would like a mirror and medicine cabinet installed over the basin. This is not possible with such a large window dominating the wall. Look at a way to move the basin from its current location to a place where a cupboard with a mirror can be installed above the basin.

The freehand drawing changes you are asked to make are:

- To reduce the window size so it ends before the bath starts.
- To move the basin so a mirror can be fixed above the basin.
- Make the necessary changes to your floor plan. (16)

4.3 Completed drawings are carefully checked and is approved by management before they are sent to the client. Particular attention must be paid to some of the more common errors found in a drawing.

Name any TWO of the common errors found in a drawing. (2)
[24]

QUESTION 5: UNITS OF MEASUREMENT

5.1 You will be required to work with the international system of units, commonly known as SI units in draughting.

Convert the following SI units below by completing the answer in the ANSWER BOOK.

5.1.1 1 minute = … seconds.

5.1.2 1 hour = … minutes.

5.1.3 12 hours = … minutes.

5.1.4 12 hours = … seconds.

5.1.5 10° Celsius = …Kelvin.

5.1.6 1 Acre = … Hectare.

5.1.7 1 full circle =…°.

(7 × 1) (7)

5.2 Degrees are used to denote angles in technical drawings.

Add the following angles:

5.2.1 33° 28' and 19° 12'.

5.2.2 210° 59' and 60° 22'

5.2.3 10° 01' and 130° 58'

Subtract the following angles:

5.2.4 105° 56' and 37° 57'

5.2.5 32° 27' and 18° 11'

5.2.6 09° 58' and 07° 01'

(6 × 1) (6)

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5.3 This question relates to exponential mathematics. Write the following numerals in the power of 10 notation.

5.3.1 0,00030

5.3.2 0,0000019

5.3.3 9 850 000

5.3.4 10 300 000

(4 × 2) (8)
[21]

TOTAL: 100

NC(O)

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ADDENDUM A **EXAMINATION NUMBER:**

2.3



(8)

(Hand in with the ANSWER BOOK)

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ADDENDUM B **EXAMINATION NUMBER:** | | | | | | | | | | | | | |

QUESTION 4 (Hand in with the ANSWER BOOK)

4.1

(6)

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ADDENDUM C **EXAMINATION NUMBER:** | | | | | | | | | | | | | |

4.2 (Use block to answer 4.2.1– and 4.2.2) **(Hand in with the ANSWER BOOK)**

(16)

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