

**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

**PLUMBING
NQF LEVEL 4**

NOVEMBER 2011

(12030544)

**18 November (Y-Paper)
13:00 – 16:00**

Candidate will require a calculator.

This question paper consists of 8 pages.

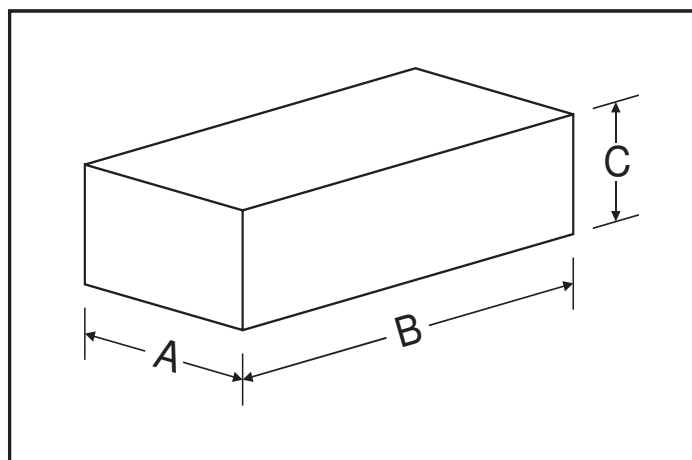
**TIME: 3 HOURS
MARKS: 120**

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, then answer all its sub-sections.
 5. Cross out any answers, or part thereof, which must not be marked, by drawing a straight line through it.
 6. Write neatly and legibly.
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QUESTION 1

- 1.1 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (1.1.1 – 1.1.6) in the ANSWER BOOK.
- 1.1.1 The purpose of the stays that you are using on profiles is to keep people from entering your building site. (1/2)
- 1.1.2 A single-leaf wall is a continuous vertical section of wall that is one masonry unit wide. (1/2)
- 1.1.3 When mixing mortar, you may replace a portion of the prescribed cement with an equal quantity of lime. (1/2)
- 1.1.4 When a manhole is built far from houses, schools or pathways, it is not necessary to install a cover on the manhole. (1/2)
- 1.1.5 You may use concrete blocks to build a manhole, provided that they were manufactured by a respectable person. (1/2)
- 1.1.6 A valve box may not be deeper than 600mm, so that a person lying on the ground can reach the invert of the drain. (1/2)
- 1.2 FIGURE 1 shows a traditional clay brick with sides A, B and C. Write only their dimensions next to the question numbers (1.2.1 – 1.2.3) in the ANSWER BOOK.
- 1.2.1 Dimension A (1)
- 1.2.2 Dimension B (1)
- 1.2.3 Dimension C (1)

**FIGURE 1**

- 1.3 Explain in simple steps how to use two straight edges and a spirit level to check if a foundation is level. (6)
[12]

QUESTION 2

- 2.1 What is a site datum and what is it used for by the plumber? (2)

- 2.2 Who determines the site datum on a building site? (1)

- 2.3 Name THREE leveling instruments that you can use to excavate trenches to their required invert levels. (3)

- 2.4 What is a rodding eye? (2)

- 2.5 FIGURE 2 is a site plan of a dwelling, showing the drainage layout and municipal connection. Calculate the following:

- 2.5.1 The invert level of RE2 (4)

- 2.5.2 The invert depth of RE2 (2)

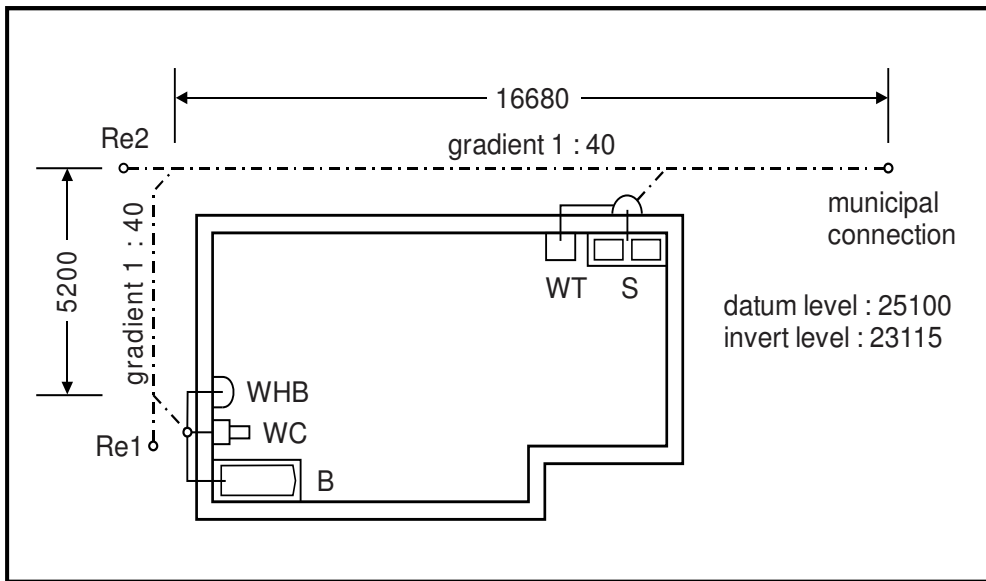


FIGURE 2

- 2.6 How wide will you excavate a trench if you need to lay a drain pipe of Ø150mm? (1)

- 2.7 Name TWO types of soil that you might come across when excavating trenches. (2)

- 2.8 If you are not sure whether an excavation needs to be shored or what type of shoring to use, what will you do? (2)

2.9 Name TWO types of bedding material. (2)

2.10 Why is it compulsory to discharge at least one waste fixture, such as a hand wash basin, into a gully? (1)

2.11 Name TWO kinds of tests that are used to detect leaks in a drainage system. (2)

[24]

QUESTION 3

3.1 What is the purpose of a tap flange? (1)

3.2 What tool will you use to grind away any dirt build-up that may have collected on the seat of a tap? (1)

3.3 In FIGURE 3 you see a schematic diagram of a tap that explains its operation. Give the names of components A, B and C. Write only the names next to the question numbers (3.3.1 – 3.3.3) in the ANSWER BOOK.

3.3.1 Item A (1)

3.3.2 Item B (1)

3.3.3 Item C (1)

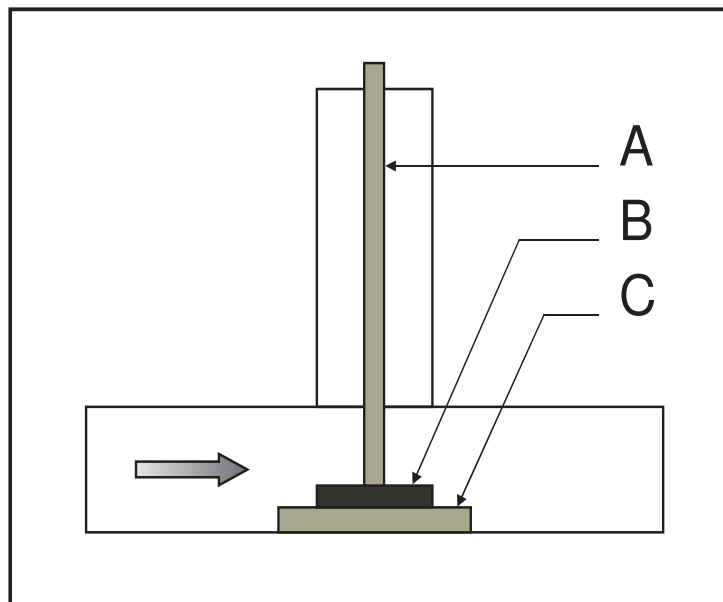


FIGURE 3

3.4 Why do pipes often burst during cold winter nights? (1)

3.5 Explain in simple steps how to repair a leak in a copper pipe. (9)

3.6 What is a cascade clamp used for? (1)

- 3.7 Name THREE ways to remove a blockage or obstruction in a drainage system. (3)
 - 3.8 List THREE methods to cut out a damaged piece of copper pipe. (3)
 - 3.9 Why is it not advisable to use beige coloured μ PVC fittings above ground? (1)
 - 3.10 What is the purpose of the rubber ring in a μ PVC fitting? (1)
- [24]**

QUESTION 4

- 4.1 What will happen if you use two different types of material for a box gutter and flashings? (1)
- 4.2 Figure 4 shows a cross-section of an installed box gutter. Name items A and B. Write only the name next to the question number (4.2.1 – 4.2.2) in the ANSWER BOOK.
 - 4.2.1 Item A (1)
 - 4.2.2 Item B (1)

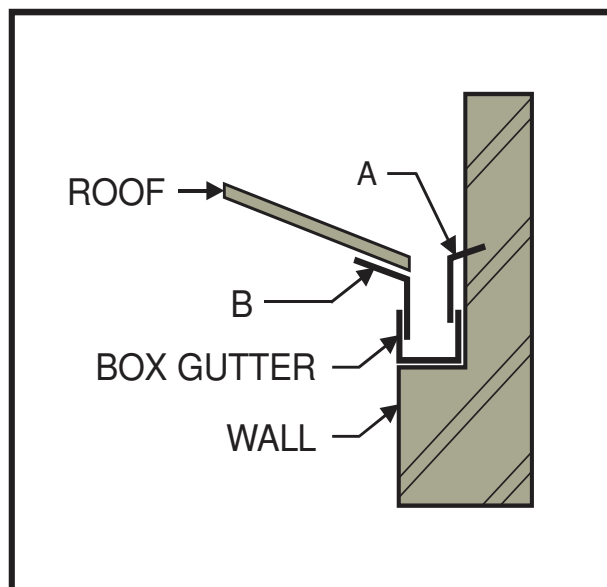


FIGURE 4

- 4.3 Name TWO tools that you can use to cut GMS sheeting. (2)
- 4.4 At what angle will you bend an abutment flashing? (1)

- 4.5 What is the minimum depth that you must rake out or saw cut a joint to install a cover flashing? (1)
- 4.6 What kind of screws must be used to screw a cover flashing to a wall? (1)
- 4.7 Why can't you use an acid based sealant for sealing between a flashing and a wall? (1)
- 4.8 What is a *chimney flashing*? (2)
- 4.9 Name the THREE parts of a chimney flashing. (3)
- 4.10 What is a *soaker* and what is it used for? (2)
- 4.11 What types of material are used for soakers? (2)
- [18]**

QUESTION 5

- 5.1 What is solar energy? (2)
- 5.2 What is radiant energy? (2)
- 5.3 What is a *solar collector* and what is its function? (3)
- 5.4 Explain the process of heating that is taking place in a solar system. (6)
- 5.5 Why does a traditional geyser that is used in a solar heating system use less electricity? (2)
- 5.6 Solar heating systems are very suitable in South Africa. Explain why? (1)
- 5.7 Name the THREE types of active solar water heating systems. (3)
- 5.8 Explain the operation of an active solar water heater briefly. (2)
- 5.9 Why are passive solar heating systems more reliable and easier to maintain than active solar heating systems? (1)
- 5.10 Why is it important to have a backup heating system in a solar water heating system? (2)
- 5.11 What is a *demand water heater*? (1)
- 5.12 List THREE very important factors that you must consider before installing a solar hot water system. (3)
- 5.13 What is an *integrated collector system (ICS)*? (2)
- [30]**

QUESTION 6

- 6.1 What valuable document will you use to convince the bank to lend you money for your new business? (1)
- 6.2 What is *profit*? (1)
- 6.3 List THREE ways in which clients might want to pay you. (3)
- 6.4 What must be specified in the contract that you draw up with a client? (4)
- 6.5 State THREE points of advice that you will give someone who has to deal with an unhappy customer. (3)
- [12]**
- TOTAL: 120**