

GAUTENG DEPARTMENT OF EDUCATION
SENIOR CERTIFICATE EXAMINATION

PLUMBING AND SHEET METALWORK SG

TIME: 3 hours

OCTOBER / NOVEMBER 2005
OKTOBER / NOVEMBER 2005

MARKS: 200

REQUIREMENTS:

- Drawing instruments

INSTRUCTIONS:

- Answer ALL the questions.
 - Ensure that all sketches are neat and in good proportion.
 - Answer Question 5.4 on Diagram Sheet 1. All the other questions must be answered in the answer book.
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QUESTION 1
WATER PURIFICATION

- 1.1 Name SIX areas in the water supply chain that need specific attention in order to prevent cholera. (6)
- 1.2 Name FIVE organisms that can pollute water. (5)
- 1.3 Name THREE types of filters that are suitable for water purification. (3)
- 1.4 Name the factors that may cause pollution of swimming pool water. (5)
- 1.5 What is the purpose of “backwashing” and how is it done? (4)
- 1.6 Why is water aerated? (2)
- [25]**

QUESTION 2
SEWERAGE

- 2.1 If the compressed air drain-testing apparatus shows a leak in the sewerage system, how would you go about detecting the leak? (4)
- 2.2 State TWO reasons why a sewerage system requires thorough planning. (4)
- 2.3 Name TWO basic methods of constructing ramps, that you would recommend. (4)
- 2.4 Which one of the basic methods of constructing ramps is the
- 2.4.1 most efficient method?
- 2.4.2 cheapest method? (4)
- 2.5 Name THREE methods which may be used to lift sewerage from the existing level to a higher level. (3)
- 2.6 Indicate the meaning of the following standard abbreviations:
- 2.6.1 CE
- 2.6.2 IE
- 2.6.3 CI
- 2.6.4 WC
- 2.6.5 ID
- 2.6.6 WHB (6)
- [25]**

QUESTION 3
SEWERAGE DISPOSAL

- 3.1 Design and draw a labelled simple longitudinal sectional sketch of a vacuum tank for a dwelling. (10)
- 3.2 Explain how a vacuum tank is emptied and how the sewerage is disposed of. (5)
- 3.3 Name TWO reasons why you would not allow waste water to be discharged into a septic tank. (4)
- 3.4 Name THREE instances where you would use a vacuum tank rather than a septic tank. (6)
- [25]**

QUESTION 4
SAFETY PRECAUTIONS

- 4.1 How would you apply industrial housekeeping in the plumbing workshop? (4)
- 4.2 Name the safety precautions you would take when using the treadle guillotine. (3)
- 4.3 How would you solve the problem of a leaking tap? (5)
- 4.4 What safety measures would you prescribe to prevent the possible transmission of Aids in the workshop? (6)
- 4.5 Name THREE causes of accidents in the workshop. (3)
- 4.6 Name the precautions you would take when drains have to be laid very shallow. (4)
- [25]**

QUESTION 5
WATER SUPPLY

- 5.1 Show by means of a labelled cross-sectional drawing, the design and lay-out you would use to install a slab urinal. (11)
- 5.2 Name TWO materials used for manufacturing slab urinals. (2)
- 5.3 Where are slab urinals usually installed? (4)
- 5.4 **Figure 5.4** on page 6 shows a sectional drawing of a wash handbasin in position. Complete the sectional drawing showing the water supply pipes and the drain pipes in position. (8)
- [25]**

QUESTION 6
CENTRAL HEATING

- 6.1 Name THREE principles of heating that you regard as important and give an example of how each is applied in a central-heating system. (9)
- 6.2 Design and draw a labelled diagrammatic sketch of a central-heating system for a three-storey building. Make use of three radiators on each floor and arrange the pipes according to the two-pipe dropping system. Indicate the flow of the water by means of arrows. (14)
- 6.3 Name TWO methods of arranging the pipes of a central-heating system. (2)
- [25]**

QUESTION 7
VENTILATION AND CENTRAL AIR-CONDITIONING

- 7.1 Name THREE aids that play an important role in improving the natural ventilation of a building. (3)
- 7.2 Explain what is meant by **ventilation**. (3)
- 7.3 Name and describe the THREE laws on which natural ventilation is based. (12)
- 7.4 Draw a sectional view of a dwelling and show by means of arrows how natural ventilation takes place. The drawing must show the following details:
- 7.4.1 External walls
 - 7.4.2 Fireplace
 - 7.4.3 Windows
 - 7.4.4 Doors
 - 7.4.5 Airbricks
- (7)
[25]

QUESTION 8
PATTERN DEVELOPMENT

The diagram on page 7 shows two views of a connecting piece with the shape of a truncated oblique cone.

The position of the groove joint is indicated on the front view.

Using a scale of 1:1, develop the pattern for the connecting piece according to the radial-line method.

[25]

TOTAL: 200

DIAGRAM SHEET / DIAGRAMVEL
QUESTION 5.4 / VRAAG 5.4

EXAMINATION NO.
EKSAMENNOMMER

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DIAGRAM FOR QUESTION 8
DIAGRAM VIR VRAAG 8