Candidate name (first, last)
First
Last
Candidate enrolment number
Date of birth (DDMMYYYY)
Gender (M/F)
Assessment date (DDMMYYYY)
Centre number
Candidate signature and declaration*

• If any additional answer sheets are used, enter the additional number of pages in this box.
• Please ensure that you staple additional answer sheets to the back of this answer booklet, clearly labelling them with your full name, enrolment number, centre number and qualification number in BLOCK CAPITALS.
• All candidates need to use a black/ blue pen. Do not use a pencil or gel pen.
• If provided with source documents, these documents will not be returned to City & Guilds, and will be shredded. Do not write on the source documents.

*I declare that I had no prior knowledge of the questions in this assessment and that I will not divulge to any person any information about the questions.

You should have the following for this examination
• a pen with blue or black ink
• non-programmable scientific calculator

General instructions
This question paper is the property of City and Guilds of London and should be returned after the examination.
• The maximum marks for each question is shown in brackets.
• Answer all questions.
1. State the term used for each of the following fluid categories.
   a) Category 3. (1 mark)
   b) Category 4. (1 mark)
   c) Category 5. (1 mark)

2. Explain the function of a Float switch in a break cistern. (2 marks)

3. Differentiate between how mechanical and non-mechanical protect against back flow. (2 marks)
4. Figure 1 shows an integral controlled cold water booster pump. Identify the components labelled A and B. (2 marks)

5. State where the secondary return pipework should enter the cylinder for correct secondary circulation. (1 mark)

6. Under the Water Act 2003, what **two** documents regulate how plumbers must install, commission and maintain water supplies within domestic buildings? (2 marks)

7. State **two** components in an unvented hot water system that enable water to be discharged to a safe termination. (2 marks)
8 Explain how the 3 tier temperature control safety features of an unvented hot water system protects the consumer. (6 marks)
9 a) Explain why the pump is positioned after the vent and feed pipework as shown in Figure 2. (2 marks)

b) Explain why it is important to maintain a maximum dimension of 150 mm between the vent and feed. (3 marks)

10 Define the term Boiler Interlock. (2 marks)
11 State two advantages of underfloor heating. (2 marks)

12 State the regulation that sets the provisions for the ventilation of a building. (1 mark)

13 Complete Table 1 by stating the maximum distances, in metres, from the soil stack to the appliance when installing the diameter waste pipework shown. (3 marks)

<table>
<thead>
<tr>
<th>Waste pipe diameter (mm)</th>
<th>Maximum distance (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

Table 1

14 Explain the installation requirements on the outlet pipe of a WC macerator. (6 marks)
15 Compare the operating principles of air source heating and ground source heating.

16 What action should be taken to rectify a 40 mm waste pipe that has exceeded a 3 m run?

17 Identify the two renewable systems that conserve water usage.

18 State how a standing (static) pressure test on a cold main would be carried out?
19. Explain how the internal components of a double-check valve protects wholesome water from contamination. (2 marks)

![Figure 3](image)

20. What type of installation is shown in Figure 4? (1 mark)

![Figure 4](image)
21 Discuss the advantages and disadvantages of installing a micro renewable system. (9 marks)