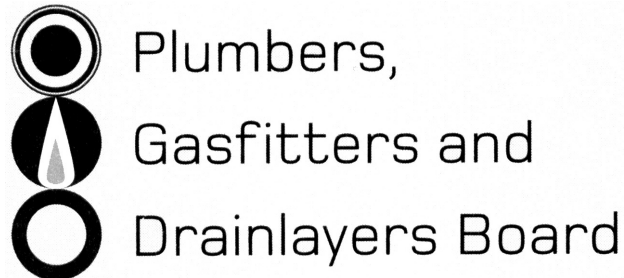


Affix label with Candidate Code  
Number here.  
If no label, enter candidate  
Number if known

.....

No. 9195



## REGISTRATION EXAMINATION, JUNE 2020

# CERTIFYING PLUMBER

QUESTION AND ANSWER BOOKLET

Time allowed THREE hours

### INSTRUCTIONS

Check that the Candidate Code Number on your admission slip is the same as the number on the label at the top of this page.

Do not start writing until you are told to do so by the Supervisor.

Total marks for this examination: 100.

The pass mark for this examination is 60 marks.

Write your answers and draw your sketches in this booklet. If you need more paper, use pages 22-25 at the back of this booklet. Clearly write the question number(s) if any of these pages are used.

All working in calculations must be shown.

### Candidates are permitted to use the following in this examination:

Drawing instruments, approved calculators, document(s) provided.

Publications, Acts, Regulations, Codes of Practice, or Standards other than the ones provided are NOT permitted in the examination room.

Check that this booklet has all of 21 pages in the correct order and that none of these pages is blank.

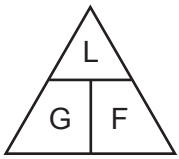
**YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION**

## USEFUL FORMULAE

Circumference of circle =  $2 \times \pi \times R$  or Circumference of circle =  $\pi \times D$

Area of circle =  $\pi \times R^2$  or Area of circle =  $0.7854 \times D^2$

Volume of cylinder =  $\pi \times R^2 \times H$  or Volume of cylinder =  $0.7854 \times D^2 \times H$



length = L

gradient = 1:G

fall = F

## SECTION A

### QUESTION 1

A corrugated iron roof has a pitch of 20°.

The maximum wind speed expected for the location is 35 metres per second.

A 100 mm vent has been installed, penetrating the roof 600 mm below the ridge.

Sketch a diagram showing the flashing required for the installation. Show all measurements.

The completed installation is to comply with the minimum requirements of the New Zealand Building Code clause E2/AS1 External Moisture.

Total 7 marks

## QUESTION 2

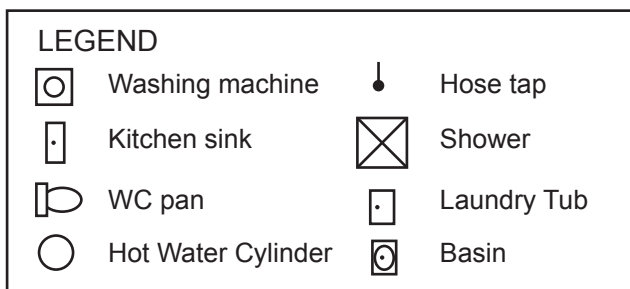
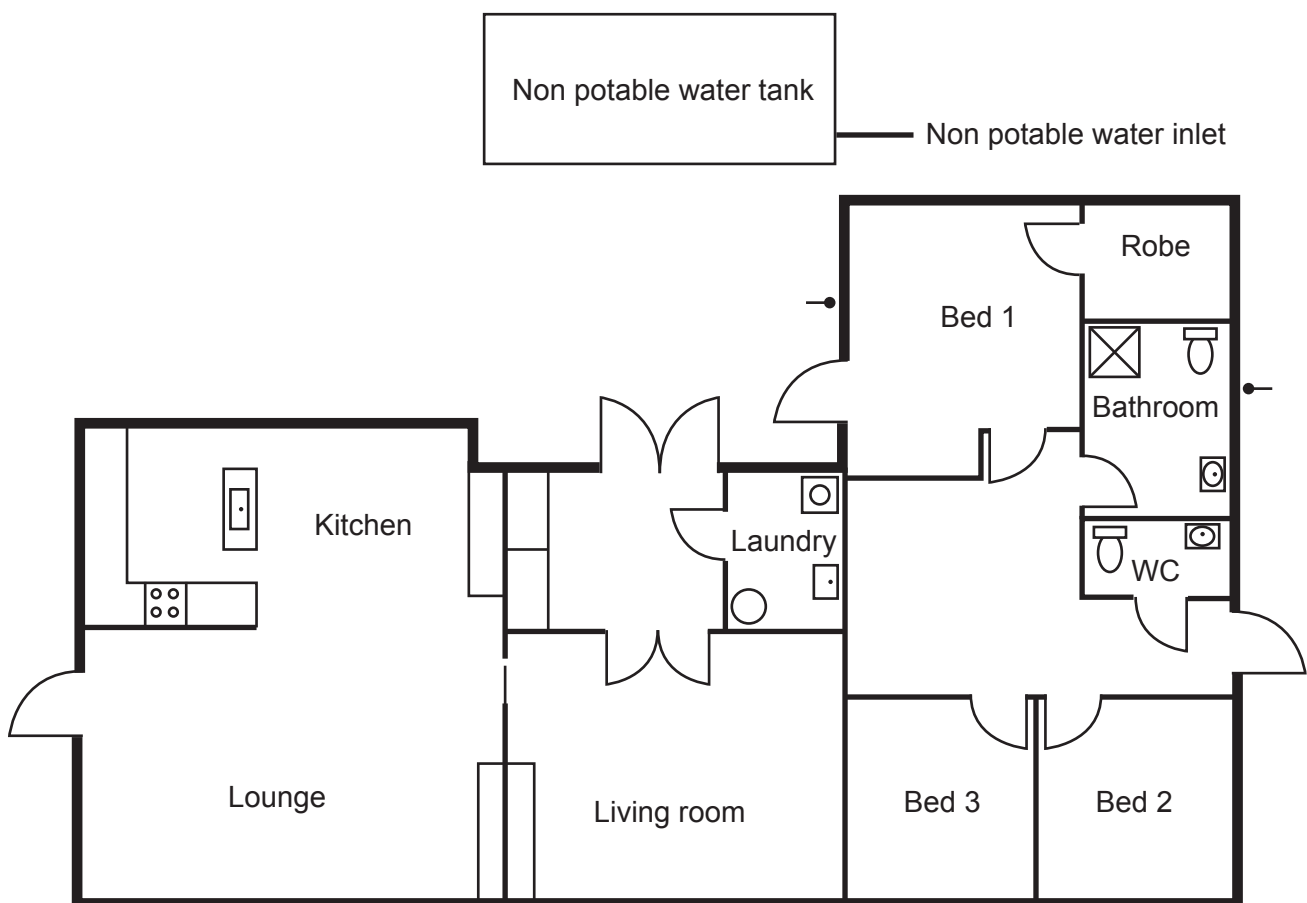
The diagram below shows the floor plan view of a dwelling.

The dwelling will be supplied with potable water from the network utility operator's water main. It will also have a non-potable water supply from a storage tank.

(a) Non-potable water is to be used to supply all outlets permitted to receive non-potable water.

Complete the diagram to show the required potable and non-potable cold water supply pipework to serve all outlets.

(4 marks)

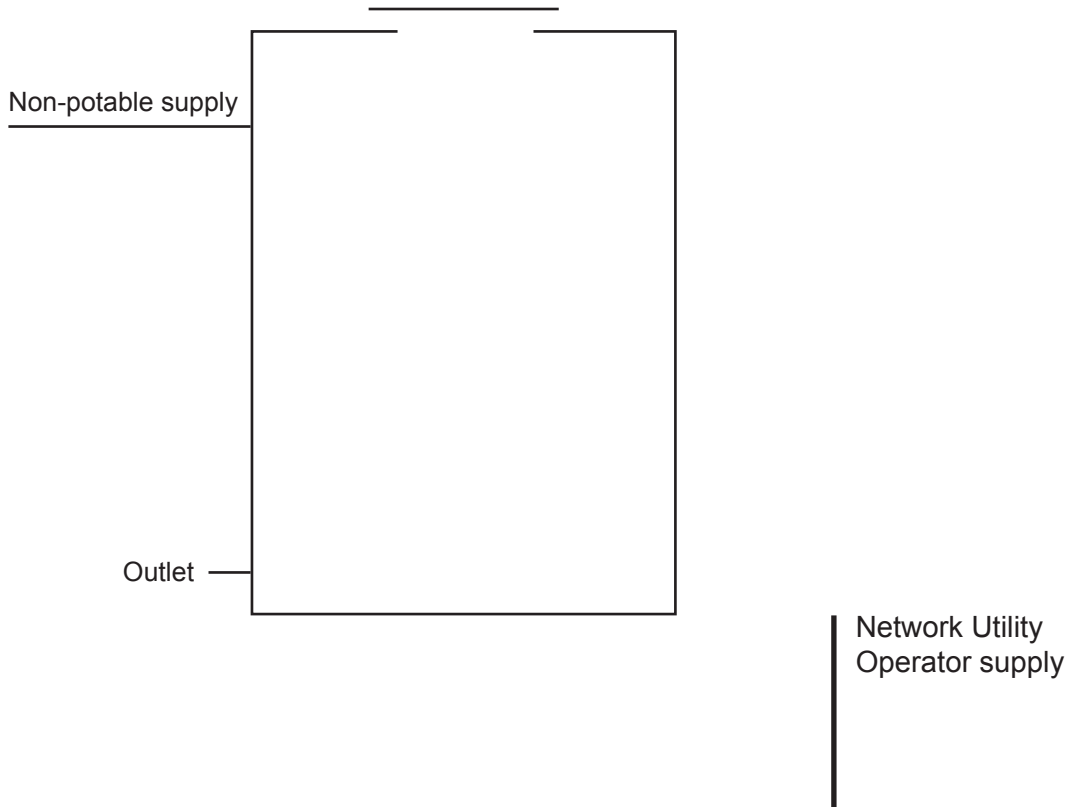


Network Utility Operator potable water supply

**QUESTION 2 (cont'd)**

(b) The drawing below shows an elevation of the water tank.

Complete the starter drawing below to show a method of connecting the potable water supply to the storage tank so that the system complies with the New Zealand Building Code clause G12 Water Supplies. Label, in full, any valve(s) used.



(3 marks)

(c) Give TWO methods of identifying which parts of the system convey non-potable water.

1 \_\_\_\_\_

2 \_\_\_\_\_

(2 marks)

**Total 9 marks**

**QUESTION 3**

(a) (i) Name the stack system shown in Figure A below.

---

---

(1 mark)

(ii) On the diagram, show the discharge pipework and any vent pipework required to connect the WC pan and basin on the second level to the stack system so that the system complies with AS/NZS 3500 Part 2: Sanitary plumbing and drainage.

(2 marks)

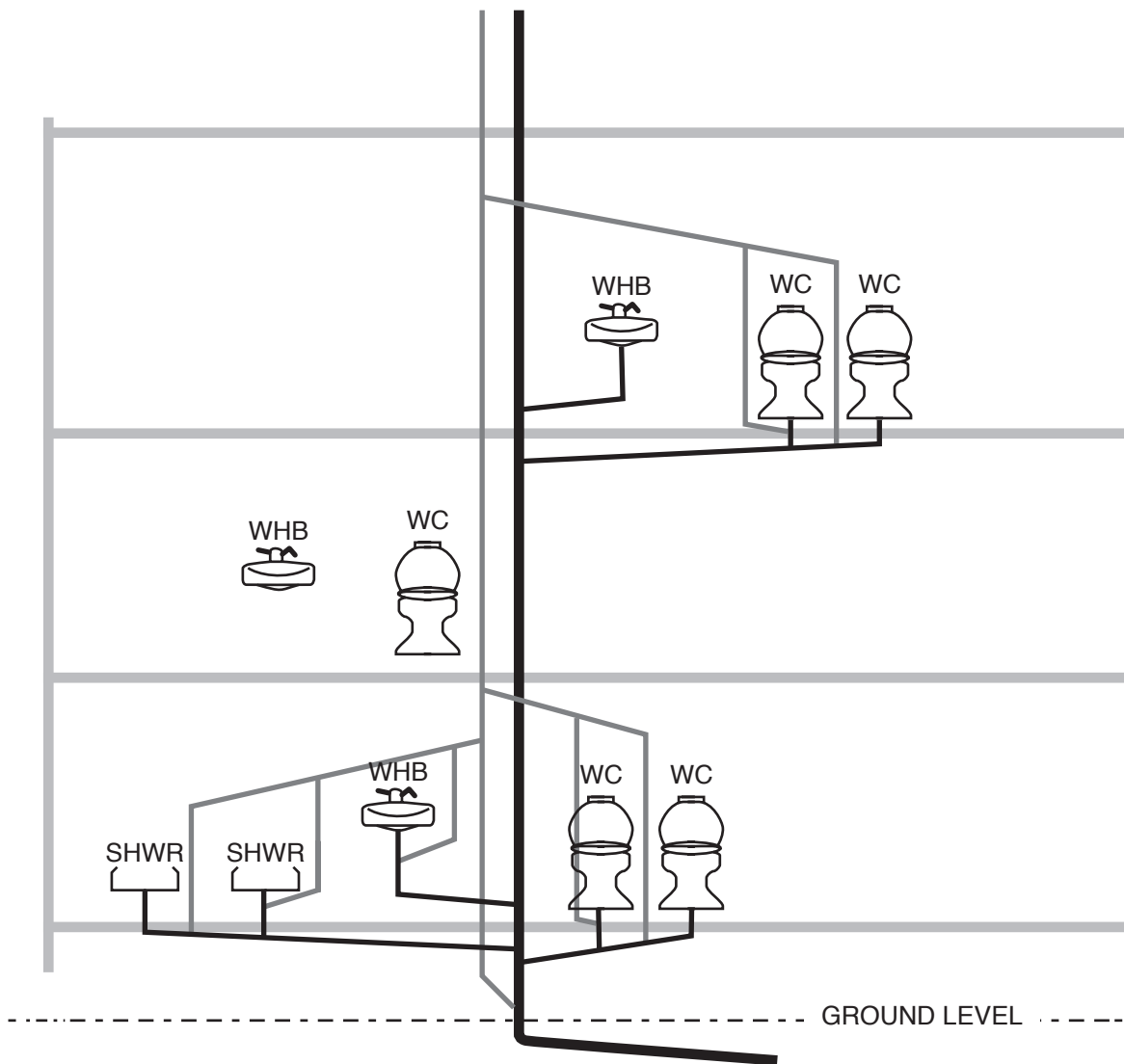


FIGURE A

**QUESTION 3 (cont'd)**

(b) (i) Name the stack system shown in Figure B below.

---

---

(1 mark)

(ii) On the diagram, show the discharge pipework and vent pipework required to connect the WC pan and basin on the second level to the stack system so that the system complies with AS/NZS 3500 Part 2: Sanitary plumbing and drainage.

(2 marks)

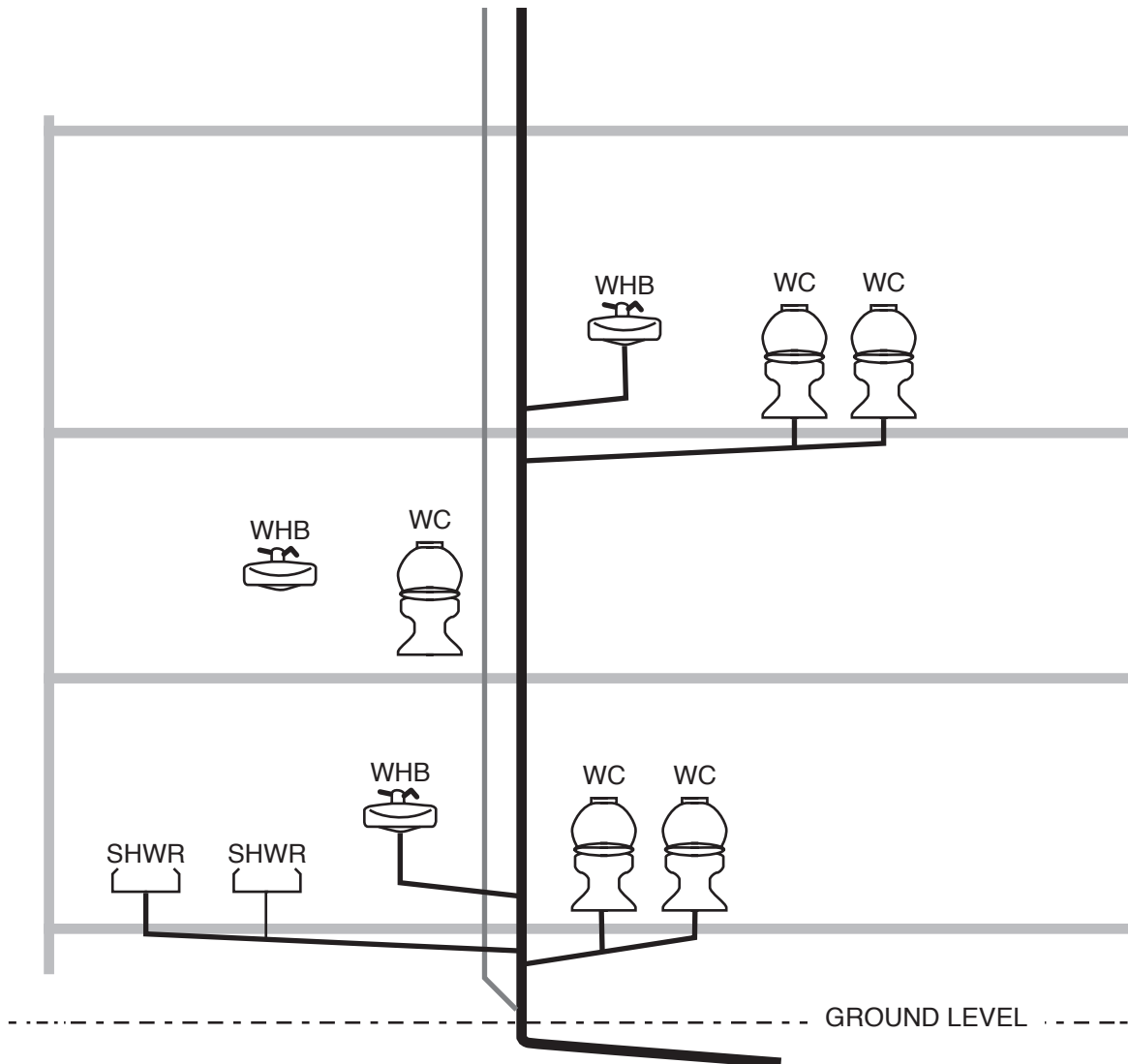


FIGURE B

**QUESTION 3 (cont'd)**

(c) (i) Name the stack system shown in Figure C below.

---

---

(1 mark)

(ii) On the diagram, show the discharge pipework and vent pipework required to connect the WC pan and basin on the second level to the stack system so that the system complies with AS/NZS 3500 Part 2: Sanitary plumbing and drainage .

(2 mark)

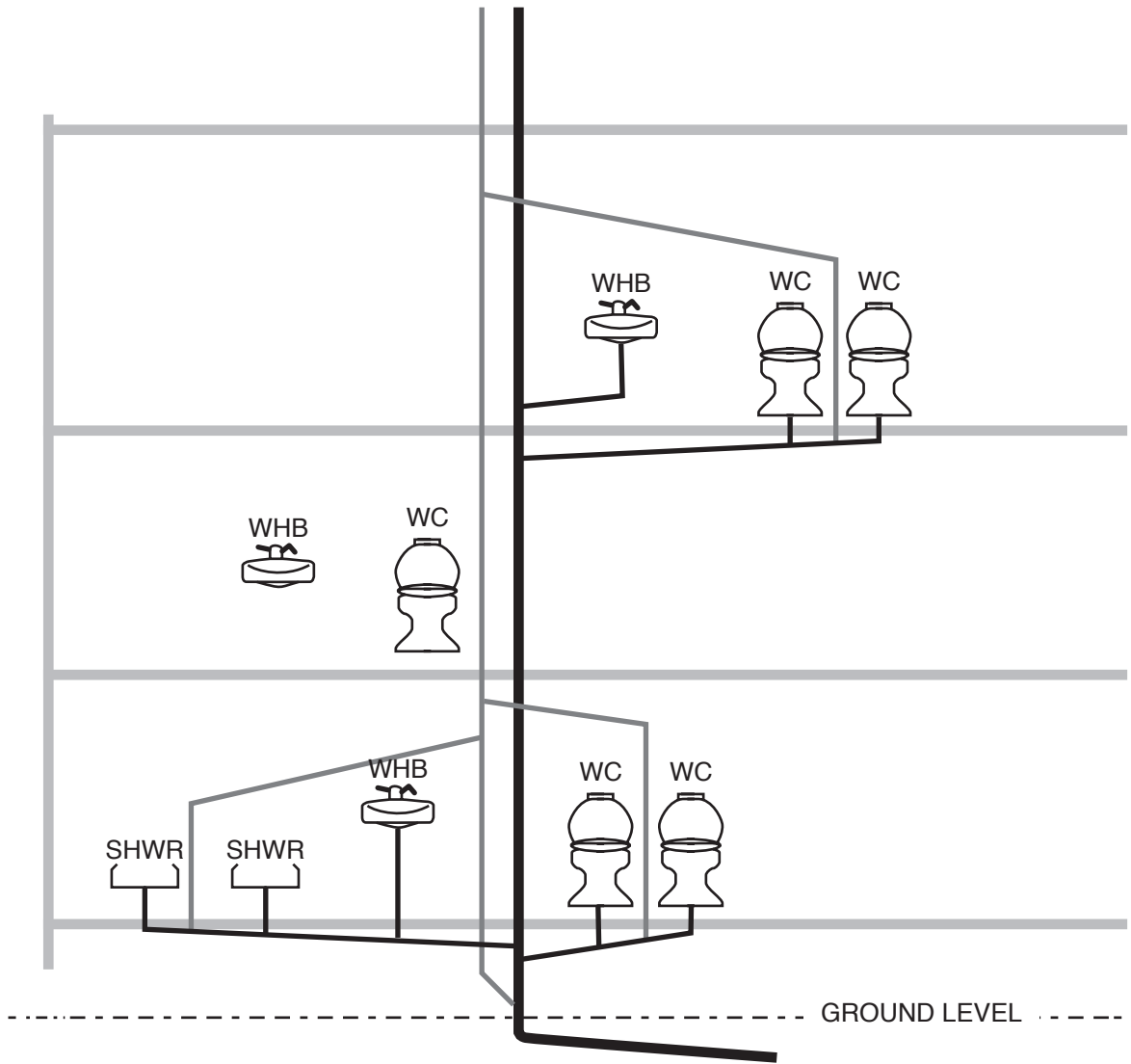


FIGURE C

**Total 9 marks**



#### QUESTION 4

(a) Name THREE approved codes of practice or guidelines relating to safety that are relevant to work carried out in the plumbing industry.

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

(3 marks)

(b) Name the TWO categories used in relation to managing worksite hazards.

1 \_\_\_\_\_

2 \_\_\_\_\_

(2 marks)

**Total 5 marks**

**QUESTION 5**

The diagram below shows the floor plan view of a proposed dwelling.

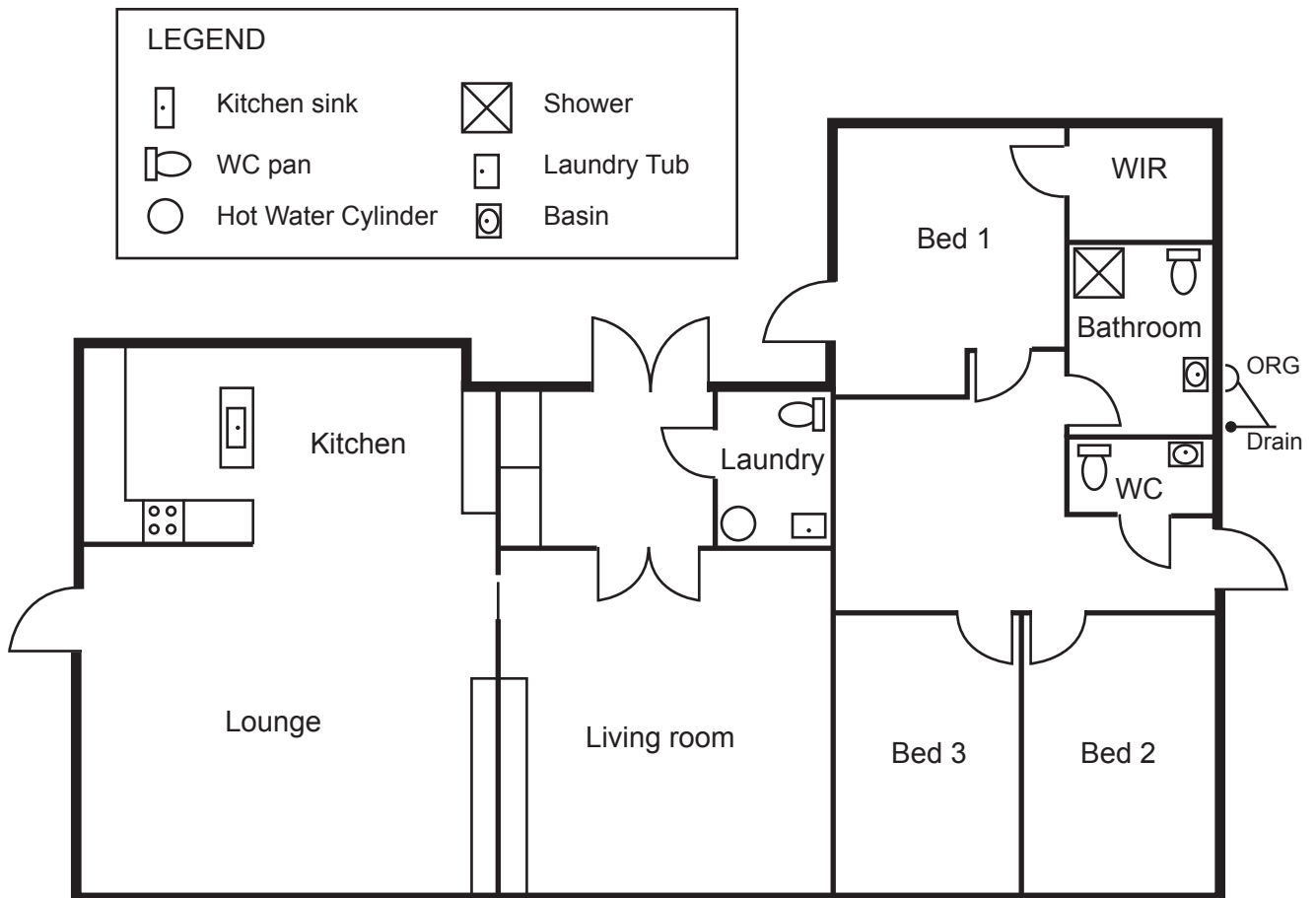
The plan is drawn to a scale of 1:100

The dwelling is to be built on a concrete pad foundation.

The drainage for the dwelling has been completed, and the connection point for the sanitary plumbing is as shown on the plan.

The sanitary plumbing system is to comply with the minimum requirements of AS/NZS 3500 Part 2: Sanitary plumbing and drainage.

- (a) On the plan, complete the underslab pipework to show all discharge pipes and vent connections that will be required to be installed before the concrete floor is poured.
- (b) On the plan, show the minimum allowable diameter for each section of discharge and vent pipework.



**Total 9 marks**

**QUESTION 6**

(a) A trench is required for a water main from a property boundary to a dwelling.

Give FOUR checks that should be carried out before starting any on-site excavation.

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_

(4 marks)

(b) Give SIX actions that could be taken to reduce the risk of an accident when working in an excavation.

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_
- 5 \_\_\_\_\_
- 6 \_\_\_\_\_

(6 marks)

**Total 10 marks**

**QUESTION 7**

- (a) A faulty temperature/pressure relief valve (TPR) on a hot water storage vessel is to be replaced.

Give THREE items of information that are required to enable a suitable replacement valve to be selected.

1 \_\_\_\_\_  
\_\_\_\_\_  
2 \_\_\_\_\_  
\_\_\_\_\_  
3 \_\_\_\_\_  
\_\_\_\_\_

(3 marks)

- (b) A cold water expansion valve is to be installed on the inlet pipework to a hot water storage vessel.

Give the pressure rating requirements that must be met.

\_\_\_\_\_  
\_\_\_\_\_

(1 mark)

- (c) A tempering valve is to be installed in a hot water system.

Give TWO factors that will determine its location.

1 \_\_\_\_\_  
2 \_\_\_\_\_

(2 marks)

**QUESTION 7 (cont'd)**

(d) Complete the following table regarding the requirements for testing hot water pipework before wall linings are installed.

Acceptable solution document	Test pressure	Test time

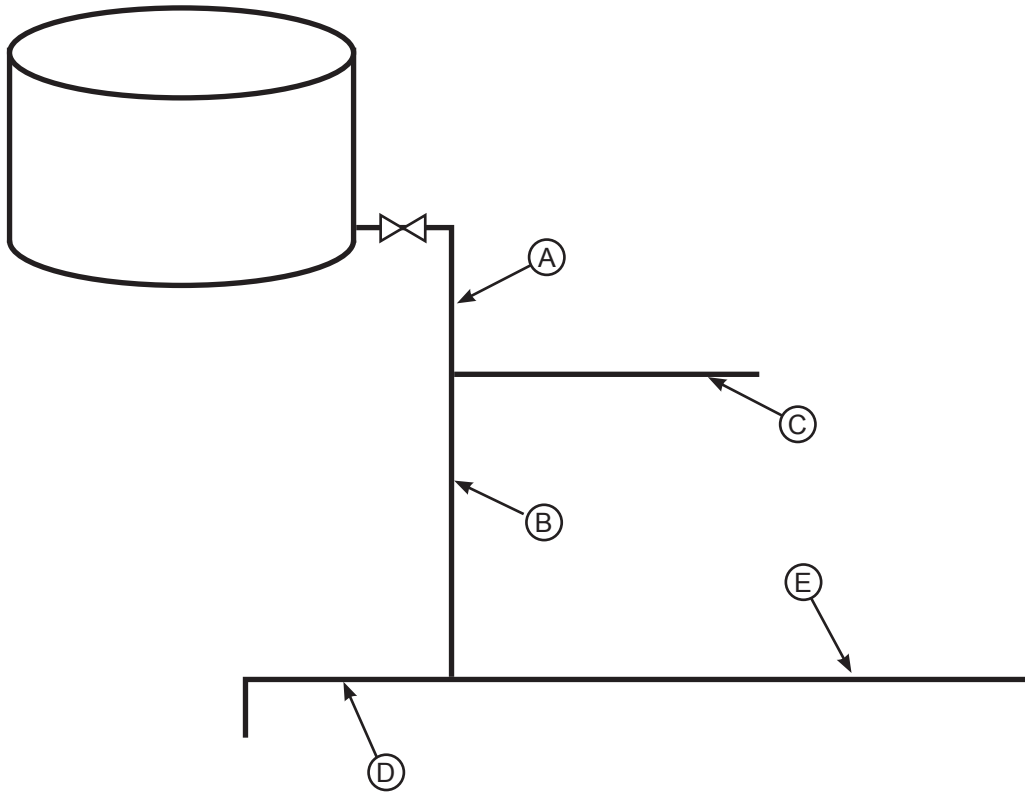
(3 marks)

**Total 9 marks**

### QUESTION 8

The diagram below shows a schematic of the potable cold water pipework from a 1500 litre tank to a series of cold water outlets.

The cold water pipework dimensions are given in the table below the diagram.



Section of pipework	Length	Diameter (ID)
A	2 metres	32 mm
B	3 metres	25 mm
C	4 metres	15 mm
D	3 metres	15 mm
E	8 metres	20 mm

**QUESTION 8 (cont'd)**

(a) Calculate the total volume of the pipework.

---

---

---

---

---

(4 marks)

(b) AS/NZS 3500 Part 1: Water services recommends using an initial chlorine dose of 50 mg/litre when disinfecting a water tank and supply pipework.

Calculate in grams the minimum amount of chlorine that is required to disinfect the tank and pipework.

---

---

(2 marks)

(c) Give a circumstance where a 50 mg/litre dose would not be adequate.

---

(1 mark)

**Total 7 marks**

**QUESTION 9**

(a) State FIVE factors that need to be checked when carrying out maintenance of a solar collector panel.

1 \_\_\_\_\_  
\_\_\_\_\_  
2 \_\_\_\_\_  
\_\_\_\_\_  
3 \_\_\_\_\_  
\_\_\_\_\_  
4 \_\_\_\_\_  
\_\_\_\_\_  
5 \_\_\_\_\_  
\_\_\_\_\_

(5 marks)

(b) Give THREE methods for protecting a solar collector water heating system from damage due to frost.

1 \_\_\_\_\_  
\_\_\_\_\_  
2 \_\_\_\_\_  
\_\_\_\_\_  
3 \_\_\_\_\_  
\_\_\_\_\_

(3 marks)

(c) Give an advantage of an evacuated tube solar collector compared with a flat plate collector.

\_\_\_\_\_

(1 mark)

**Total 9 marks**



**QUESTION 10**

A customer has stated that they are not satisfied with the hot water available in the shower. They have advised that the temperature of the water is adequate and that they do not run out of hot water, but that the hot water in the shower is weak.

(a) Give THREE possible remedies to improve the shower performance that would be considered exempt work as prescribed in Schedule 1 of the Building Act.

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

(3 marks)

(b) Give THREE situations relating to working on hot water supply systems that will require a consent from the local building consent authority.

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

(3 marks)

**Total 6 marks**

**QUESTION 11**

A discharge stack system is being designed so that it will comply with AS/NZS 3500 Part 2: Sanitary plumbing and drainage.

(a) Give a circumstance in which each of the following vents are required.

(i) Relief vent

---

---

(ii) Cross relief vent

---

---

(2 marks)

(b) An 80 mm discharge stack serving sanitary fixtures on three levels is installed so that it complies with AS/NZS 3500 Part 2: Sanitary plumbing and drainage.

(i) Give FOUR restrictions that apply to the system.

1 

---

---

2 

---

---

3 

---

---

4 

---

---

(2 marks)

**QUESTION 11 (cont'd)**

(b) (ii) The stack is to be constructed from copper.

Give FOUR requirements the installation of the supports for the stack must meet.

1 \_\_\_\_\_  
\_\_\_\_\_

2 \_\_\_\_\_  
\_\_\_\_\_

3 \_\_\_\_\_  
\_\_\_\_\_

4 \_\_\_\_\_  
\_\_\_\_\_

(4 marks)

**Total 8 marks**

## SECTION B

Answer the following multiple-choice questions by writing your answer (A, B, C, D or E) in the box provided after each one of the questions.

Each correct answer in this section of the examination is worth 1 mark.

Should your choice of answer be unclear no mark will be awarded.

1. When flashing a square penetration through a roof, what is the minimum height required for the upstand on the flashing to comply with New Zealand Building Code clause E2/AS1?

- A 75 mm.
- B 90 mm.
- C 100 mm.
- D 110 mm.
- E 150 mm.

2. What is the maximum roof pitch on which an EDPM rubber boot flashing is permitted to be used to seal a roof penetration to comply with New Zealand Building Code clause E2/AS1?

- A 10°
- B 15°
- C 20°
- D 30°
- E 45°

3. At which pipe diameter does fitting a soaker flashing under a flexible boot flashing become required for the installation to comply with the New Zealand Code clause E2/AS1 External moisture?

- A 41 mm
- B 52 mm
- C 66 mm
- D 86 mm
- E 105 mm

4. Which of the following is the minimum requirement for stored water from a solar water heating system to prevent the growth of legionella bacteria?
- A The temperature must reach 60°C or higher once a week for not less than 1 hour.
  - B The temperature must reach 55°C for 2 hours once a day.
  - C The temperature must reach 100°C every two days.
  - D The temperature must be kept above 60° at all times.
  - E The temperature must be kept above 70°C at all times.

5. Why is a restricted entry zone required at the base of a discharge stack?
- A To prevent blockages from occurring.
  - B To stop oscillation within the discharge stack.
  - C To stop the pipe running full bore.
  - D To prevent trap seal loss.
  - E To increase the number of discharge units the stack can convey.

6. Which of the following is NOT an acceptable reason to disturb the scene of an accident that has resulted in serious harm?
- A To recover plant and equipment from the site.
  - B To save a life.
  - C To prevent suffering of an injured person.
  - D To maintain public access to services (eg. gas and electricity).
  - E To prevent serious damage to property.

7. An accident resulting in serious harm has occurred on a job site.  
Which of the following must be contacted with details of the accident as soon as possible?
- A The local territorial authority.
  - B WorkSafe.
  - C The Plumbers, Gasfitters and Drainlayers Board.
  - D The Health and Safety Representative for the site.
  - E The Regional Health and Safety inspector.

8. A certifying plumber has employed an apprentice who now holds a trainee limited certificate.  
What is the minimum length of time the apprentice must work in the direct presence of the certifying plumber?
- A 6 months.
  - B 12 months.
  - C 24 months.
  - D 36 months.
  - E Until such time as the apprentice achieves registration.

9. Edge protection is to be erected around the perimeter of a roof.  
What is the maximum allowable gap from the edge of the spouting to the guardrail?
- A 50 mm.
  - B 100 mm.
  - C 150 mm.
  - D 200 mm.
  - E 250 mm.

10. What is the maximum allowable temperature for hot water supplied to a basin in an aged-care facility?
- A 32°C.
  - B 36°C.
  - C 45°C.
  - D 50°C.
  - E 55°C.
- 

11. Within what length of time must the Plumbers, Gasfitters and Drainlayers Board be notified of a registered plumber's change of address?
- A 7 days.
  - B 28 days.
  - C 6 weeks.
  - D 3 months.
  - E 6 months.
- 

12. By what date must registered plumbers renew their annual practising licence?
- A 1 March.
  - B 1 April.
  - C 20 May.
  - D 30 June.
  - E 31 December.
- 

**Total 12 marks**





This page is available for additional working or answers

Question number \_\_\_\_\_

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---



This page is available for additional working or answers

Question number \_\_\_\_\_

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

For Examiner's use only

Question number	Marks	Marks
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
Section B		
Total		