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

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No. 9195

Plumbers, Gasfitters and Drainlayers Board

REGISTRATION EXAMINATION, JUNE 2023

CERTIFYING PLUMBER

QUESTION AND ANSWER BOOKLET

Time allowed THREE hours

INSTRUCTIONS

Please check that the booking reference number on your booking confirmation slip is the same as the number on the label at the top of this page.

Do not remove the exam booking confirmation slip from your exam paper.

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

Total marks for this examination: 100.

This exam booklet consists of 2 sections

Section A – Questions 1 to 10

Section B – Questions 1 to 12

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 25-28 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.

Do not use red pen for drawings or writing in your paper.

Check that this booklet has all of 30 pages in the correct order.

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 = $0.7854 \times D^2 \times H$

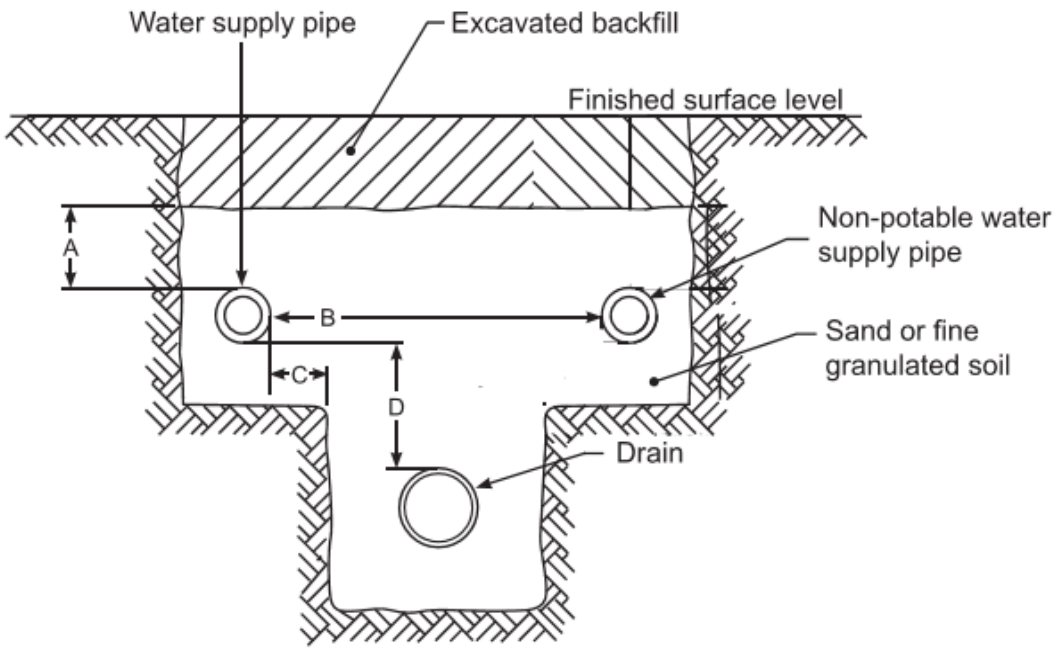
length = L
gradient = 1:G
fall = F

SECTION A

QUESTION 1

A water supply pipe is to be installed to comply with AS/NZS 3500 Part 1: Water services.

(a) The diagram below shows potable and non-potable water supply pipes laid in a trench with a drain.



(a) Give the minimum measurement required for each of the distances marked A, B, C and D.

A _____

B _____

C _____

D _____

(4 marks)

(b) Before entering a building, the potable water supply pipe must cross over a telecommunications cable.

Give TWO requirements in addition to the minimum allowable separation distance that must be met in relation to the cross over.

1 _____

2 _____

(2 marks)

Total 6 marks

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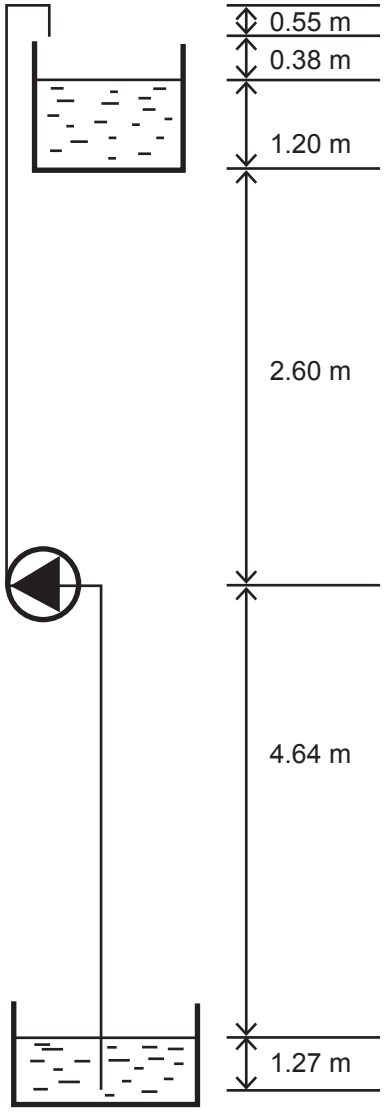
QUESTION 2

The diagram below shows a pumping system.



Using the information on the diagram, give the total measurements for each of the following.

(a) Static suction lift _____

(b) Total static head _____

(c) Total delivery head _____

(d) Static delivery head _____

(e) Total pump head _____

Total 5 marks

INTENTIONALLY BLANK

QUESTION 3

Some people require supervison when completing plumbing work.

(a) State the minimum length of time that a trainee plumber must work under the direct supervision of their supervisor.

_____

(1 mark) ☐

(b) State the minimum length of time that a plumber working with an exemption under supervision must work under the direct supervision of their supervisor

_____

(1 mark) ☐

(c) Name TWO licensing categories other than trainees and exemption holders that also have supervision requirements that must be met by a certifying plumber.

1 _____

2 _____

(2 marks) ☐

(d) Describe what is meant by the term nominated person in relation to plumbing.

_____

_____

(2 marks) ☐

Total 6 marks ☐

QUESTION 4

(a) A plumber has been injured at work.

Give EIGHT items of information that should be included on the accident record.

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

8 _____

(4 marks)

(b) Give THREE examples of positions within a company that would be considered officers of the company, and be responsible for ensuring that PCBU (persons conducting a business or undertaking) meet their health and safety responsibilities.

1 _____

_____

2 _____

_____

3 _____

_____

(3 marks)

(c) Give an example of a plumbing job that would be considered Particular Hazardous Work.

_____

(1 mark)

QUESTION 4 (cont'd)

(d) Name the organisation to which a Particular Hazardous Work Notification form needs to be submitted.

_____

(1 mark)

(e) State how long before work commences that a Particular Hazardous Work Notification form should be submitted.

_____

(1 mark)

Total 10 marks

QUESTION 5

The plan on the next page shows a proposed two-storey dwelling and the layout of the sanitary fixtures in the dwelling.

The plan is drawn to a scale of 1:100

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

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

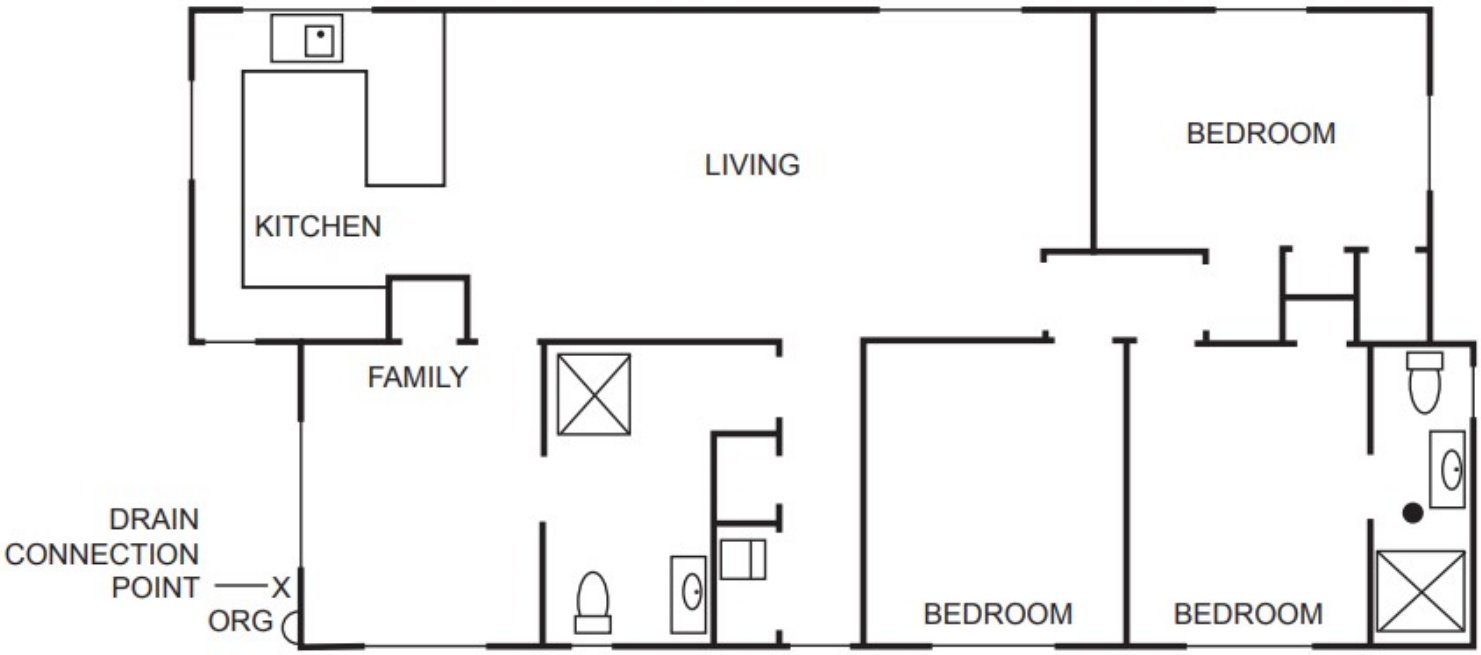
The sanitary plumbing system is to comply with the minimum requirements of AS/NZS 3500 Part 2: Sanitary plumbing and drainage.

(a) On the plan, draw all requires pre-slab discharge pipes and show the location of any requires vent(s).

(b) On the plan, show the minimum allowable diameter for each section of discharge and vent pipework drawn in (a).

Total 11 marks

QUESTION 5 (cont'd)



QUESTION 6

(a) (i) Give THREE events after which a backflow prevention device must be tested.

1 _____

_____

2 _____

_____

3 _____

_____

(3 marks)

(ii) State who is required to arrange for a backflow prevention device to be tested.

_____

(1 mark)

(b) State the requirements that must be met if a bypass system is to be fitted to a backflow prevention device installation.

_____

_____

(2 marks)

QUESTION 6 (cont'd)

(c) The following table lists some plumbing fixtures or installations requiring backflow protection.

Complete the table by ticking the appropriate boxes to show the cross connection hazard rating of each so that each complies with the minimum requirements of the New Zealand Building Code acceptable solution G12/AS1: Water Supplies.

Fitting, fixture, or installation	High	Medium	Low
Hairdressing sink			
Car washing equipment			
Swimming pool			
Dentist spittoon			
Untreated water storage tank			
Irrigation systems with underground controllers			

(3 marks)

Total 9 marks

QUESTION 7

Hot water cylinder installations are to be designed to comply with New Zealand Building Code clause G12/AS1 Water Supplies.

(a) (i) Complete the table to show the maximum allowable hot water temperature for each situation given.

Situation	Temperature
Supply to a wash hand basin at a pre-school	
Supply to a wash hand basin in a commercial building	
Supply to a bath in a dwelling	

(ii) State the minimum temperature at which hot water should be stored to prevent the growth of legionella bacteria.

(2 marks)

(b) (i) State the capacity at which a third seismic restraint strap becomes required on a hot water storage cylinder.

(1 mark)

(ii) Explain where on the cylinder the three straps must be located.

(2 marks)

(c) State the minimum length of time a hot water cylinder relief drain installed under a concrete floor slab must last to meet the durability requirements of the New Zealand Building Code.

(1 mark)

QUESTION 7 (cont'd)

(d) A relief valve drain for a hot water cylinder is to be installed, and will be 8 metres long.

(i) Give the maximum number of bends permitted to be used in the design of the drain.

_____

(1 mark)

(ii) Give FIVE other requirements that must be met relating to the installation of the relief valve drain.

1 _____

2 _____

3 _____

4 _____

5 _____

(5 marks)

Total 12 marks

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QUESTION 8

Define each of the following terms as it relates to the New Zealand Building Code.

(a) Acceptable solution.

(2 marks)

(b) Verification method.

(2 marks)

(c) Alternative solution.

(2 marks)

Total 6 marks

INTENTIONALLY BLANK

QUESTION 9

The diagram below shows part of a foul water installation consisting of four discharge stacks.

Each stack is to have a relief vent fitted. All the relief vents are to connect to a header vent.

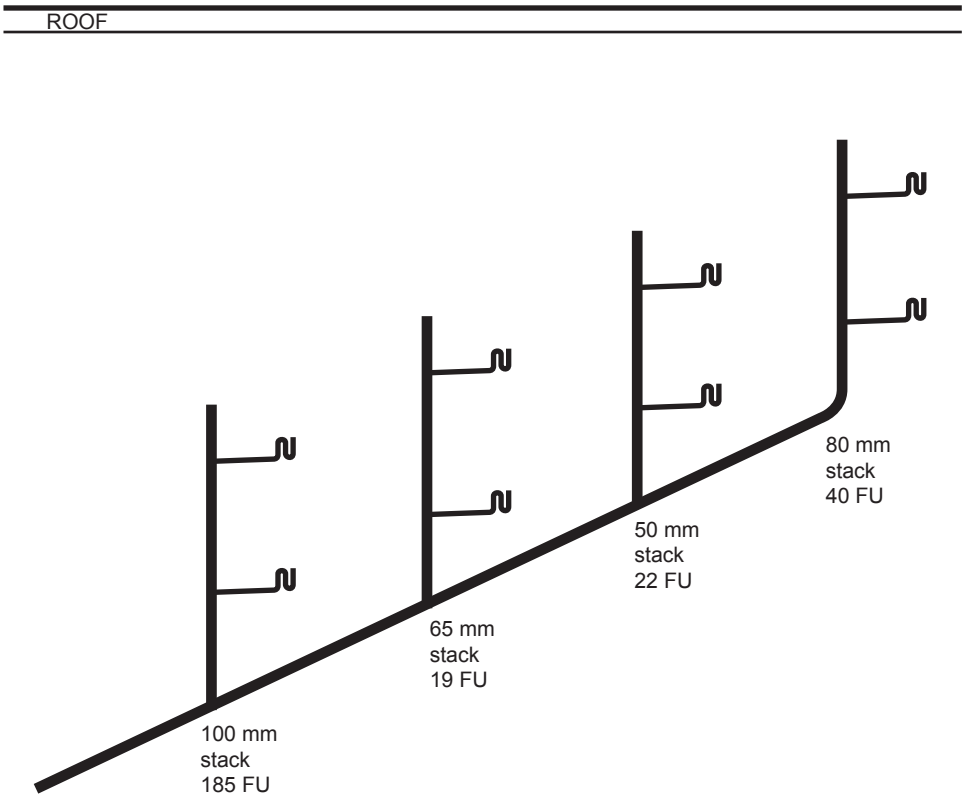
The header vent is to connect to the stack vent from the 100 mm foul water stack.

The developed length of each relief vent is 16 metres.

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

(a) Complete the drawing to show the relief vents, header vent and stack vent.

(4 marks)



(b) Using the stack diameters and fixture unit ratings (FU) shown on the diagram, size each vent. Write your answers on the diagram.

(7 marks)

Total 11 marks

QUESTION 10

(a) Give TWO reasons why a cover is fitted to storage water tanks.

1 _____

2 _____

(1 mark)

(b) In addition to a cover, give FOUR requirements that must be met for the installation of a tank to comply with New Zealand Building Code.

1 _____

2 _____

3 _____

4 _____

(4 marks)

(c) Give TWO benefits of installing break tanks in a high-rise building.

1 _____

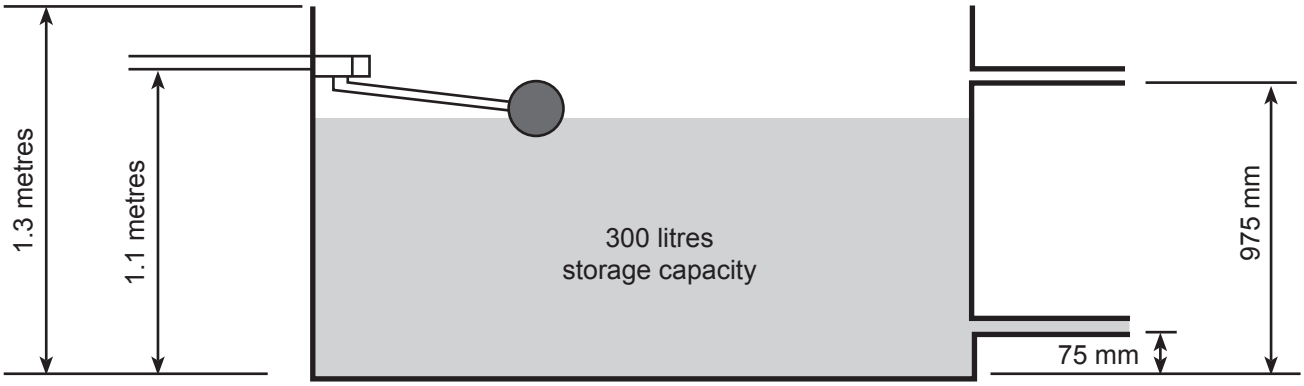
2 _____

(2 marks)

QUESTION 10 (cont'd)

(d) AS/NZS 3500 Part 1: Water services specifies that the storage capacity of any tank shall be taken to be the volume of water above the invert of the outlet pipe when the water surface is 20 mm below overflow level.

The diagram below shows a round tank that meets this requirement.



All connection points for the tank are 25 mm.

Using the information shown on the diagram, calculate the diameter of the tank.

(5 marks)

Total 12 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. Which of the following is the best method of controlling hazards in the workplace and to comply with the Health and Safety in Employment Act?

   A Isolate employees from the hazard.

   B Minimise the hazard to the employees.

   C Eliminate the hazard from the employee's workplace.

   D Provide all necessary personal protection equipment to employees.

   E Monitor the employees' health and exposure to the hazard.

   ☐

2. 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 provide help to an injured person.

   C To remove a deceased person.

   D When directed by a police officer.

   E To make the site safe.

   ☐

3. Which of the following is an advantage of using an indirect heating system?

   A Higher temperatures can be achieved.

   B The temperature can be maintained at a more stable level.

   C One heat source can be used for both potable and non-potable hot water supplies.

   D The pressure rating of the circulating pump can be increased.

   E A tempering valve is not required on the installation.

   ☐

4. An 8 metre length of pipe has been installed at a gradient of 1:80 (1.25%).

What is the pipe fall?

A 8 mm.

B 10 mm.

C 80 mm.

D 100 mm.

E 1000 mm.

☐

5. A water service carrying non-potable water is to be installed.

Which colour pipe or marking should be used to enable future identification of the pipe?

A Pink.

B Red.

C Yellow.

D Orange.

E Purple.

☐

6. What is the minimum depth below ground level a water main is permitted to be installed below a lawn or garden as specified in the New Zealand Building Code clause G12 Water Supplies?

A 450 mm.

B 500 mm.

C 600 mm.

D 750 mm.

E 1000 mm.

☐

7. What is the minimum allowable pressure for a hydrostatic soundness test on cold water pipework?

   A 100 kPa.

   B 500 kPa.

   C 1000 kPa.

   D 1500 kPa.

   E 2000 kPa.

   ☐

8. How is the pressure rating for a temperature pressure relief valve installed on a hot water cylinder determined?

   A Must be higher than that of the cold water expansion valve and that of the cylinder.

   B Must be lower than that of the cold water expansion valve and that of the cylinder.

   C Must be of the same pressure rating as that of the cold water expansion valve and that of the cylinder.

   D Must be lower than that of the cold water expansion valve and higher than that of the cylinder.

   E Must be higher than that of the cold water expansion valve and lower than that of the cylinder.

   ☐

9. A community care building must store how many litres of water per person for use when the water supply to the building is interrupted?

   A 25

   B 50

   C 75

   D 100

   E 150

   ☐

10. To provide backflow protection, what is the minimum size for an air gap?

A Equal in size to the inlet pipe diameter.

B 2 × the inlet diameter or 25 mm, whichever is greater.

C 3 × the inlet diameter or 30 mm, whichever is greater.

D 20 mm.

E 40 mm.

☐

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. A pipe is to be laid at a gradient of 2.5%. The fall is 1350 mm.

What is the length of the pipe?

A 5.4 m

B 11.4 m

C 14 m

D 54 m

E 140 m

☐

Total 12 marks ☐

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Question number _____

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Question number	Marks	Marks
1		
2		
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Section B		
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