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, NOVEMBER 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.

This exam booklet consists of 2 sections

Section A – Question 1 to 10

Section B – Question 1 to 13

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 25-26 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 28 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) Complete the table below to identify which hazard management category each of the actions listed fits into.

Action	Minimise	Eliminate
Replacing a noisy machine		
Using earmuffs or earplugs		
Using edge protection when working at heights		
Training staff in the correct use of equipment		
Wearing safety glasses		
Fitting safety guards to machinery		
Providing screens around an area where welding is taking place		
Completing work, usually performed at heights, on ground level		

(4 marks)

(b) The Health and Safety at Work Act defines 'notifiable injury or illness' in relation to a person.

Give SIX examples of injuries or illnesses that would be in this category.

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

(3 marks)

Total 7 marks

QUESTION 2

The plan on the opposite page shows the layout of sanitary fixtures for a new 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.

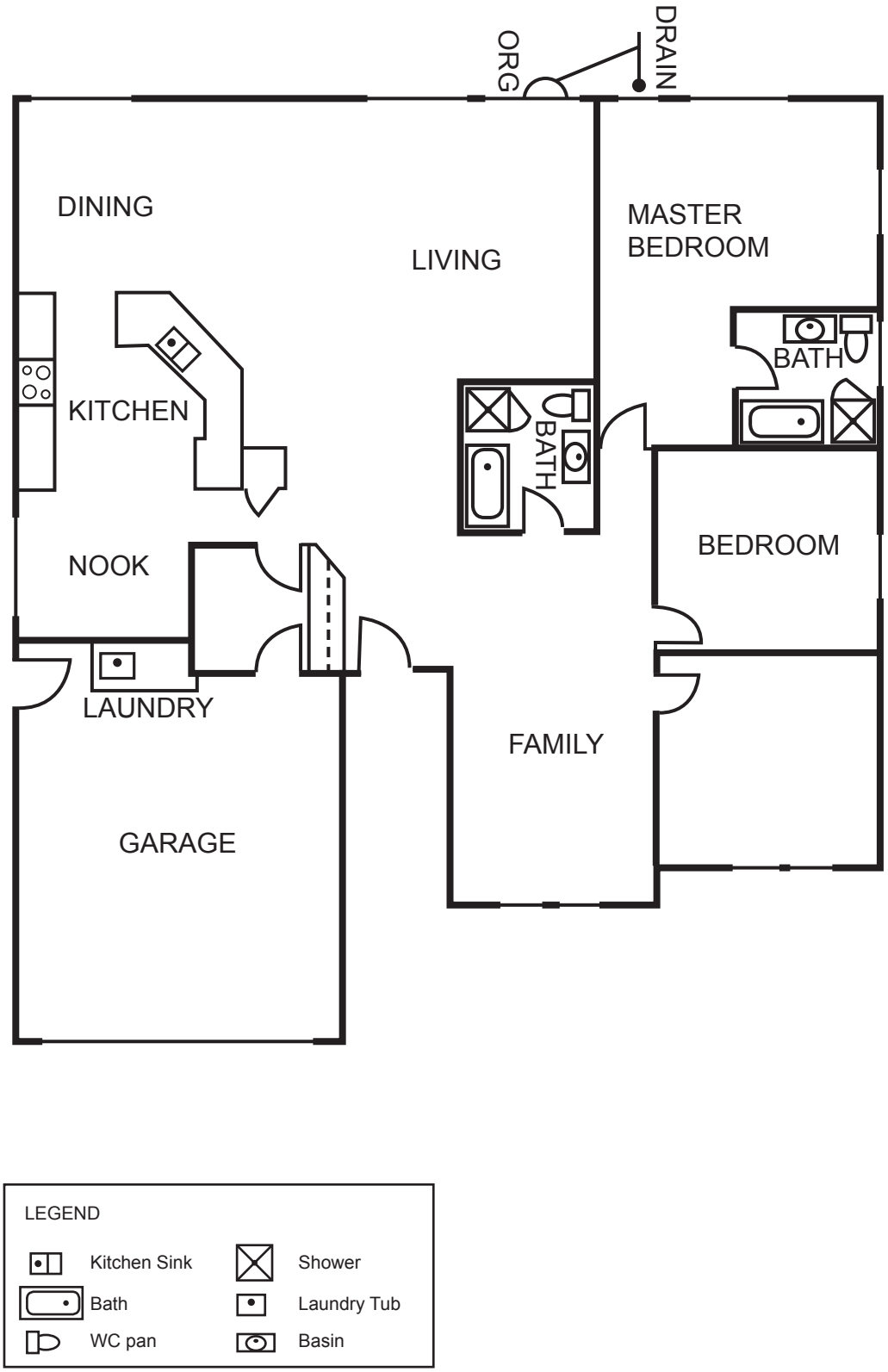
The sanitary plumbing system is to comply with the minimum requirements of AS/NZS 3500 Part 2: Sanitary plumbing and drainage.

(a) On the plan, complete the underslab pipework to show all discharge pipes and vent connections that will need to be installed before the concrete floor is poured.

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

Total 9 marks

QUESTION 2 (cont'd)



QUESTION 3

(a) Give SIX requirements that must be met when installing an untrapped floor waste so that it complies with AS/NZS 3500 Part 2: Sanitary plumbing and drainage.

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

(3 marks)

(b) Give the angle at which a stack offset changes from being vertical to being graded.

_____

(1 mark)

(c) A 6 m length of foul water pipe is to be installed at a gradient of 1:50.

Calculate in mm the fall required.

_____

_____

(2 marks)

QUESTION 3 (cont'd)

(d) A 5 m length of foul water pipe falls 125 mm over its length.

Calculate the gradient the pipe has been installed at.

_____

_____

(2 marks)

Total 8 marks

QUESTION 4

The schematic diagram shows a series of fixtures fitted with flushing valves supplied by a break tank. The available head to the upper level is 4 m.

Answer the following so that the system complies with the minimum requirements of AS/NZS 3500 Part 1: Water services.

(a) Complete the following table to give the diameter of the pipe supplying the flushing valves in each labelled section of the diagram.

Section	Diameter
A – B	
B – C	
C – D	
E – F	
E – G	
H – I	

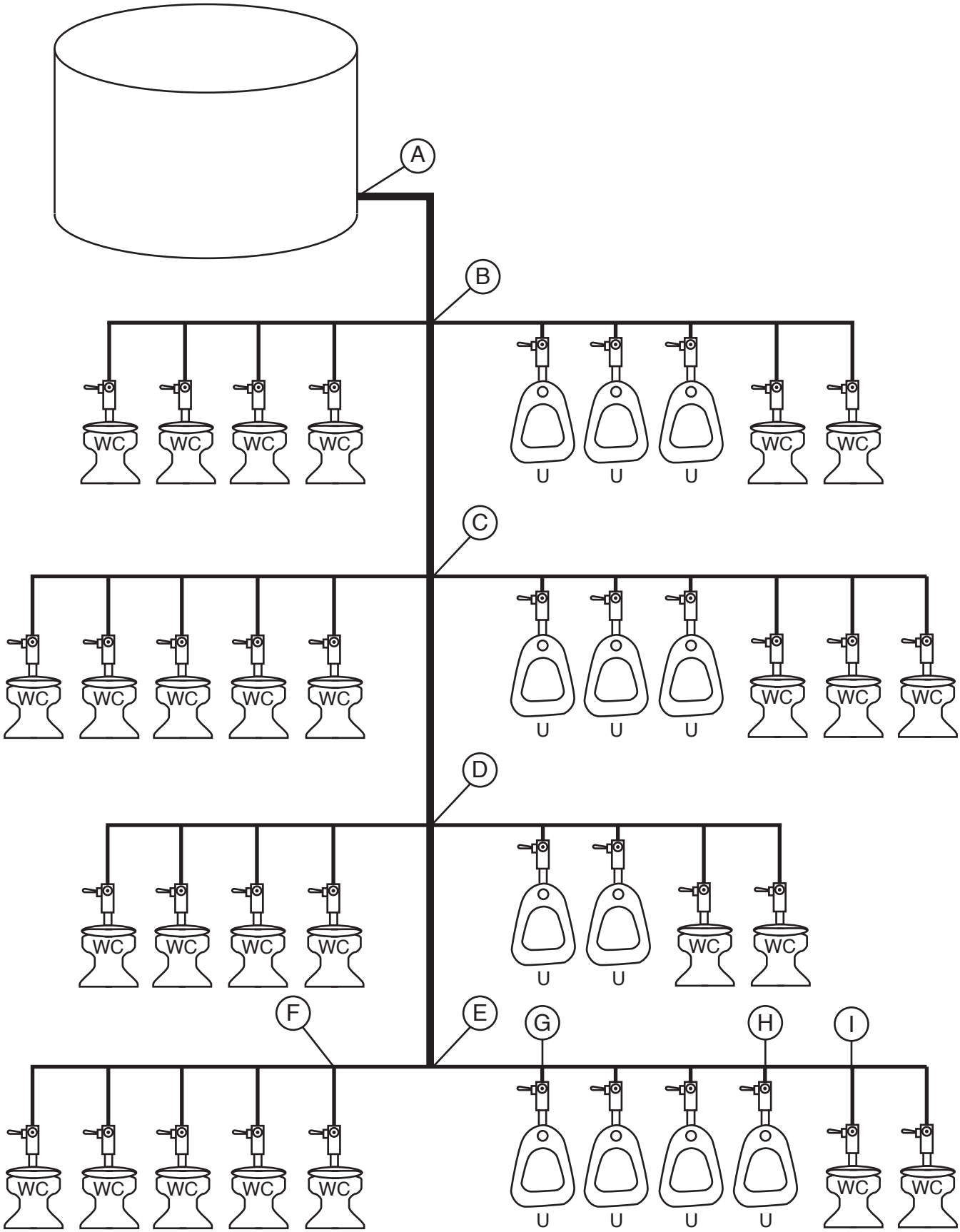
(6 marks)

(b) Calculate the minimum capacity permitted for the break tank supplying water to the flushing valves.

(4 marks)

Total 10 marks

QUESTION 4 (cont'd)

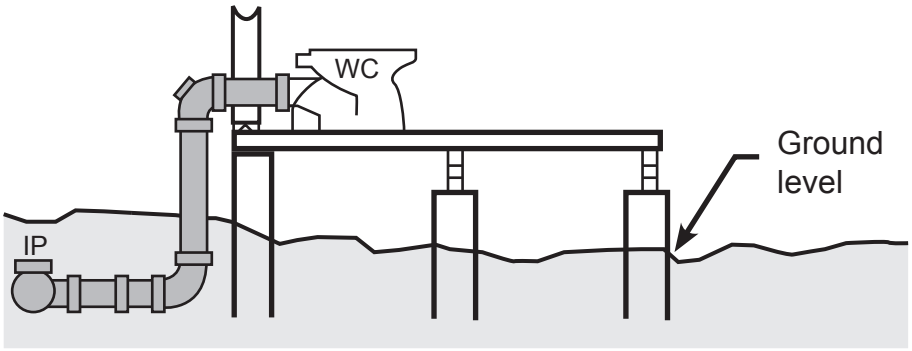


QUESTION 5

Each diagram below shows the discharge pipework between a WC pan and a foul water drain.

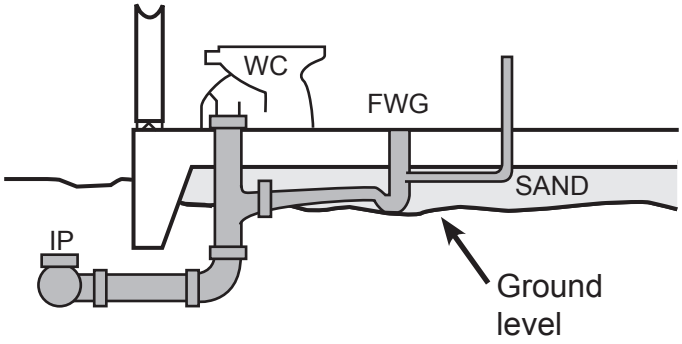
Draw a line on each diagram to show the place where the foul water discharge pipework changes from being sanitary plumbing to drainlaying.

(a)



(1 mark)

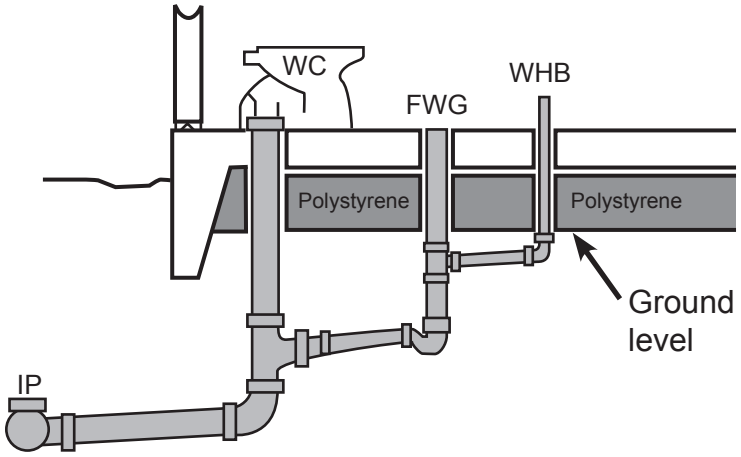
(b)



(1 mark)

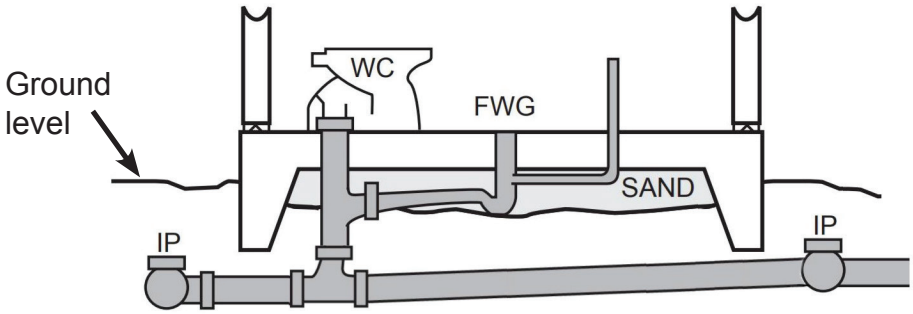
QUESTION 5 (cont'd)

(c)



(1 mark)

(d)



(1 mark)

Total 4 marks

QUESTION 6

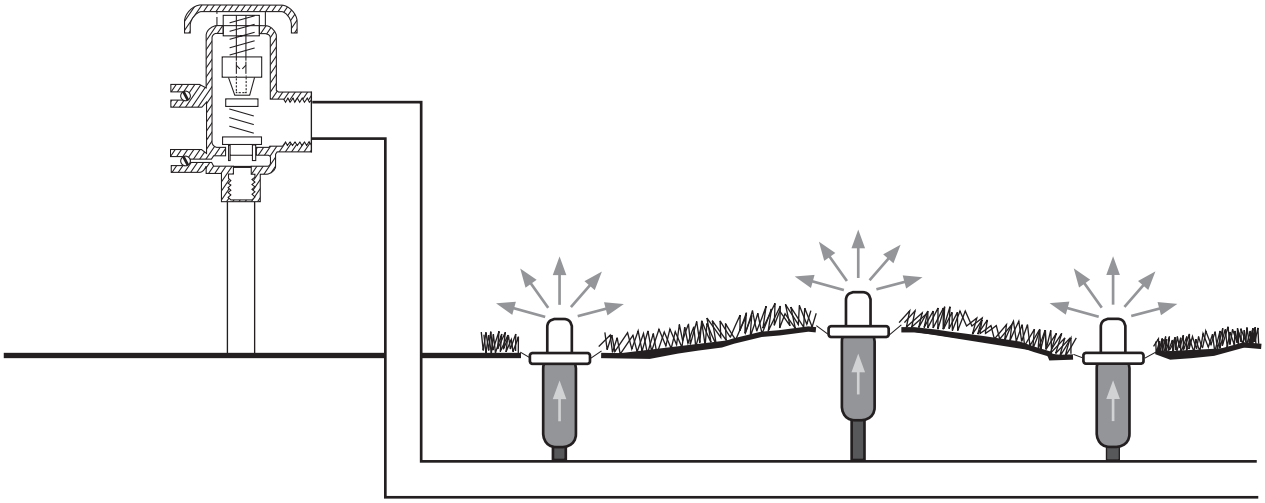
(a) The diagram below shows the installation of a pressure vacuum breaker (PVB) backflow prevention device on a lawn sprinkler system.

(i) State the minimum height at which the device is permitted to be installed.

_____

(1 mark) ☐

(ii) On the diagram, show the two points between which the measurement in (i) is taken.



(1 mark) ☐

(b) (i) Give ONE difference between the design of pressure vacuum breakers and atmospheric vacuum breakers.

_____

(1 mark) ☐

(ii) Give TWO differences between the installation requirements of pressure vacuum breakers and atmospheric vacuum breakers.

1 _____

2 _____

(2 marks) ☐

(c) Give the maximum time an atmospheric vacuum breaker is allowed to be continuously pressurised with water.

_____

(1 mark) ☐

QUESTION 6 (cont'd)

(d) Explain why there is a limit to the amount of time an atmospheric vacuum breaker is allowed to be pressurised with water.

(2 marks)

(e) Give the meaning of the following terms in relation to backflow.

(i) High hazard

(1 mark)

(ii) Medium hazard

(1 mark)

(iii) Low hazard

(1 mark)

Total 11 marks

QUESTION 7

Five houses are to be built down a right-of-way, as shown in the plan on the opposite page.

The pressure available from the public water supply is 525 kPa.

The highest fixture outlet is 2.2 m above the public water supply connection point A.

The minimum head required for the fixture outlets is 5 m.

The length of consumer pipework from the toby labelled H to the furthest outlet is 9 m.

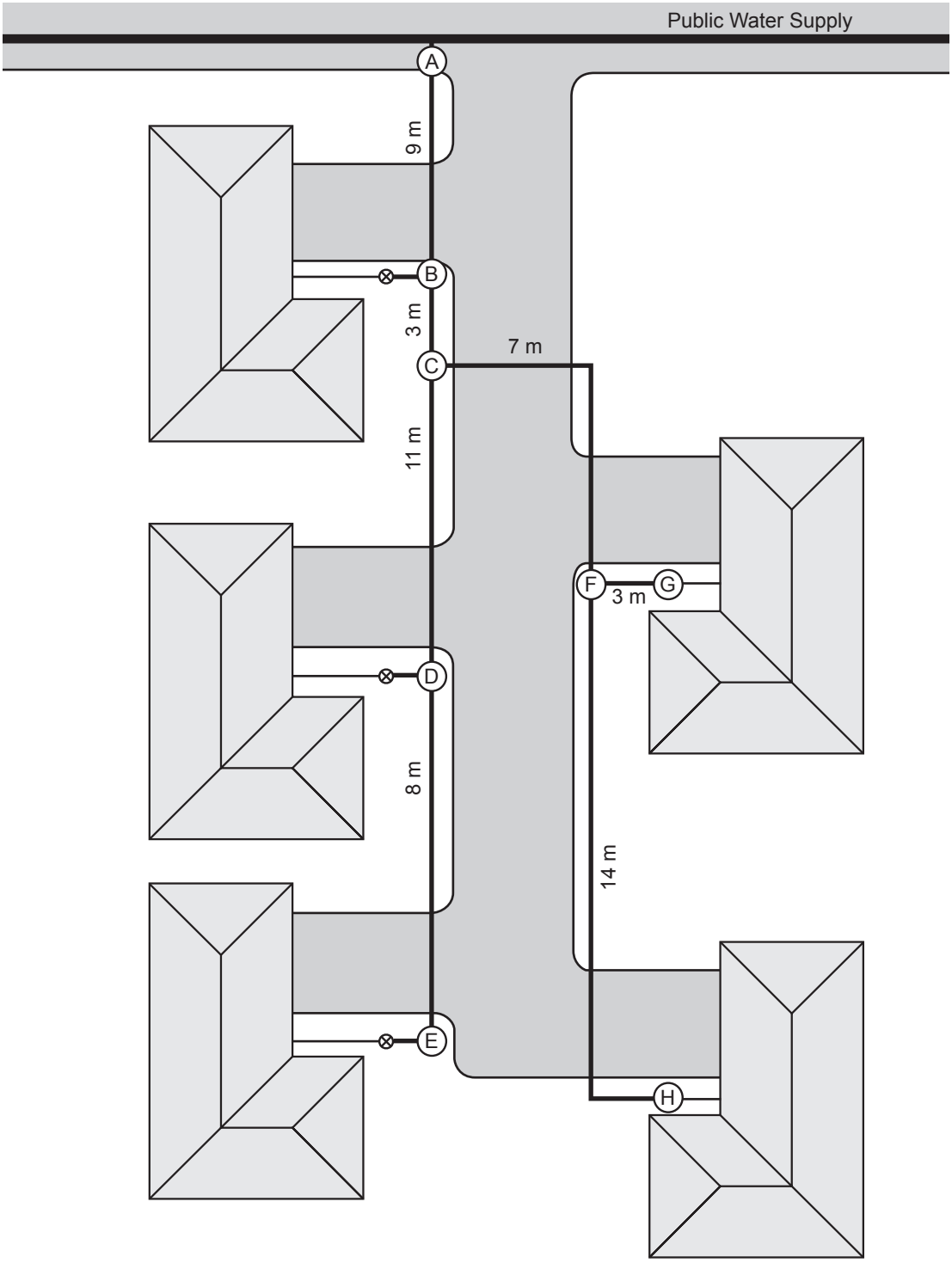
Using the procedure in AS/NZS 3500 Part 1: Water services Appendix C, complete the tables below to size the pipework.

Index length of installation	Pressure drop

Pipe Section	Probable simultaneous demand (L/s)	Nominal pipe size (DN)
A – B		
B – C		
C – D		
D – E		
C – F		
F – G		

Total 17 marks

QUESTION 7 (cont'd)



QUESTION 8

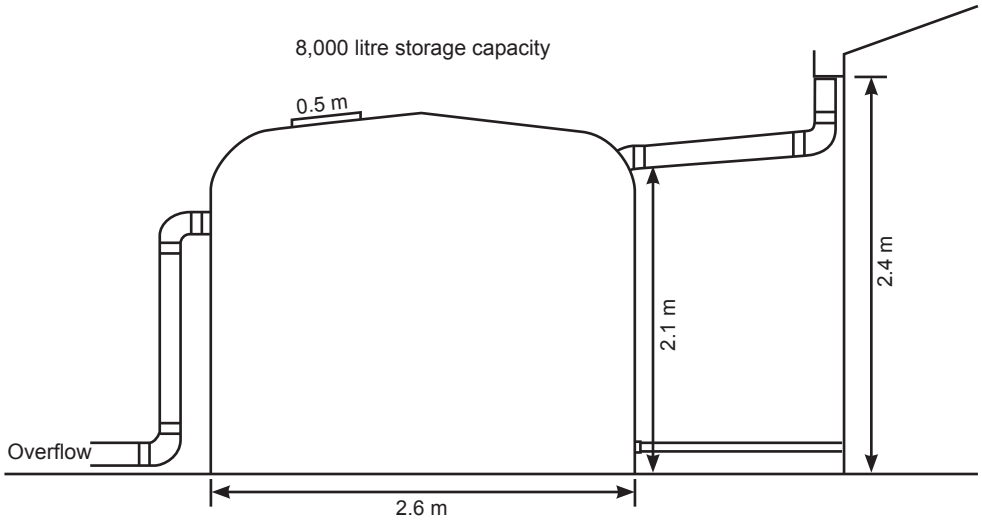
(a) A local regional council requires that a dwelling stores two days' supply of water at 125 litres per person per day. The dwelling is to house six people.

Calculate the minimum required storage capacity for the water tank.

(1 mark)

(b) The drawing below shows a water tank installed on a site.

Calculate the minimum height the overflow pipe can be installed at so that an 8000 litre capacity is maintained.



(4 marks)

QUESTION 8 (cont'd)

(c) A top-up supply from the network utility operator's water main is to be added to the tank.

Give TWO factors that determine where on the tank the top-up supply should be installed.

1 _____

2 _____

(2 marks)

(d) Give the capacity at which an isolating valve must be installed on the outlet of a supply tank as stated in AS/NZS 3500 Part 1: Water services.

_____

(1 mark)

Total 8 marks

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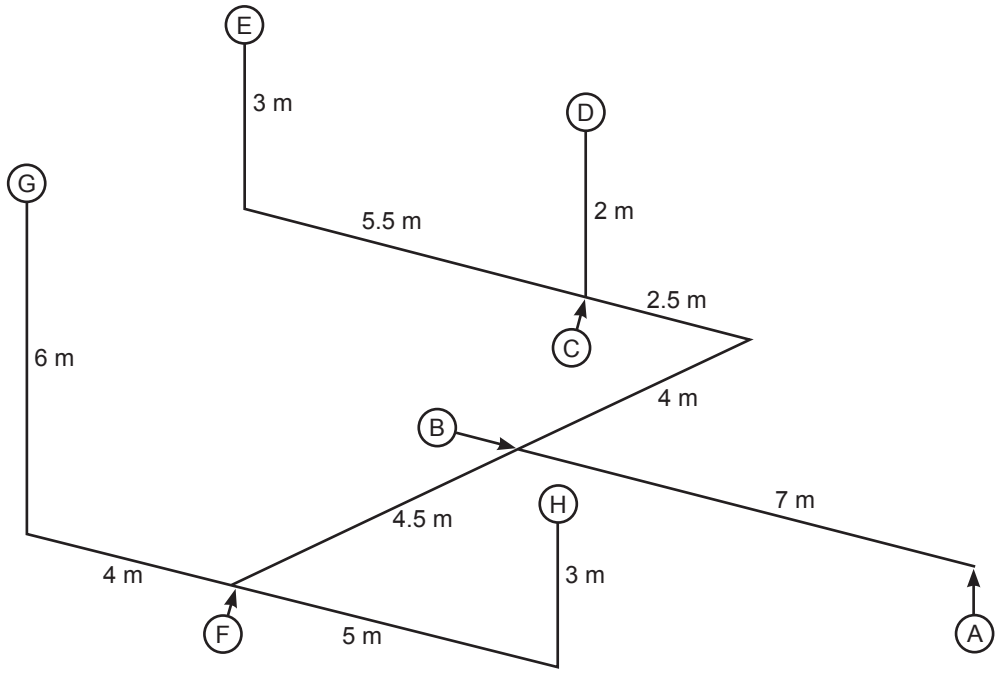
QUESTION 9

The diagram below shows a schematic of polybutylene water supply pipework in a building.

The building specifications state the following.

- Support is to be provided 100 mm from the end of each pipe.
- Three clips are to be included for each tee, each located 100 mm from the tee.
- Two clips are to be included for each bend, each located 100 mm from the bend.
- The straight lengths of pipework are to be supported to comply with the minimum requirements of AS/NZS 3500 Part 1: Water services.



Complete the table below to show the number of clips required for each listed section of the pipework. The diameter of the pipework in each section is as shown.

Pipe section	Number of clips
A – B (20 mm)	
B – C (20 mm)	
C – D (15 mm)	
C – E (15 mm)	
B – F (20 mm)	
F – G (15 mm)	
F – H (15 mm)	

Total 7 marks

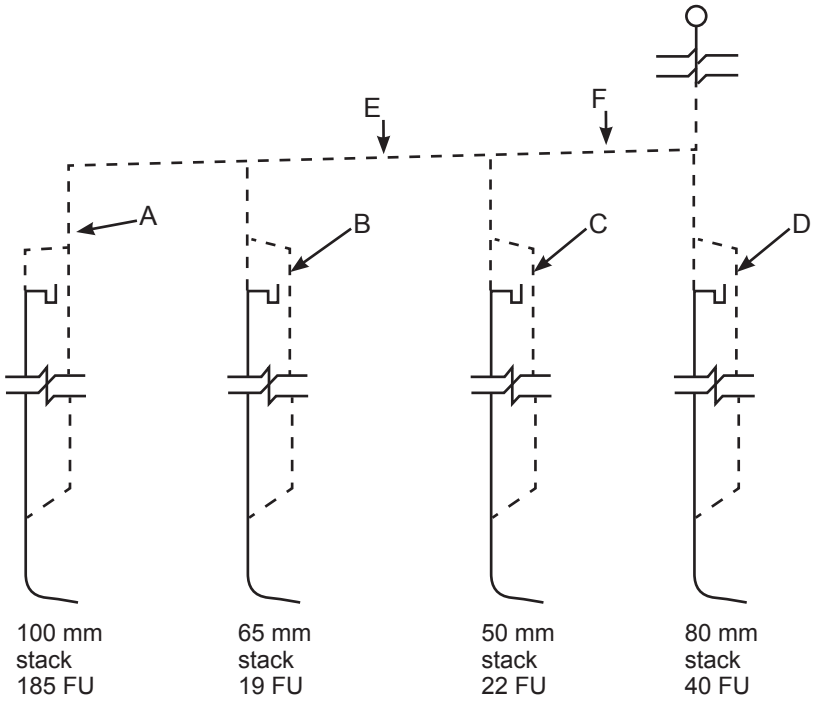
INTENTIONALLY BLANK

QUESTION 10

The schematic below shows the discharge stacks and vents required for a building.

Using the stack diameters and fixture unit ratings (FU) shown on the diagram, complete the table to show the required diameter at each point indicated.

The developed length of each relief vent is 20 m.



Point	Diameter
A	
B	
C	
D	
E	
F	

Total 6 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 includes the requirements regarding all workplace health and safety?

   A Department of Labour Code of Practice.

   B Health and Safety at Work Act.

   C WorkSafe guidelines.

   D Health and Safety in Employment Act.

   E Plumbers, Gasfitters and Drainlayers Act.

   ☐

2. Which of the following is NOT an acceptable reason to disturb the scene of an accident that has resulted in serious harm?

   A When directed by a police officer.

   B To provide help to an injured person.

   C To recover plant and equipment from the site.

   D To remove a deceased person.

   E To make the site safe.

   ☐

3. Plumber A has requested the assistance of a tradesman plumber employed by Plumber B.

   Who is responsible for ensuring that the tradesman plumber is capable of completing the proposed work safely?

   A The tradesman plumber.

   B The Plumbers, Gasfitters and Drainlayers Board.

   C Plumber A.

   D Plumber B.

   E WorkSafe.

   ☐

4. A certifying plumber has employed a trainee who now holds a limited certificate.

   What is the minimum length of time must the trainee work in the presence of a qualified supervisor?

   A 6 months.

   B 12 months.

   C 24 months.

   D 36 months.

   E Until such time as the trainee achieves registration.

   ☐

5. 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.

   ☐

6. Which of the following must receive a completed Particular Hazardous Work Notification Form before such work is started?

   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.

   ☐

7. How much notice must be given before Particular Hazardous Work is carried out?

   A 24 hours.

   B 48 hours.

   C 72 hours.

   D 5 working days.

   E 10 working days.

   ☐

8. Under which of the following circumstances can an employee choose not to wear the personal protective equipment gear supplied?

   A When the ambient temperature is above 32°C.

   B When the total weight of the PPE gear exceeds 16 kg.

   C When it is agreed the PPE gear makes a task more difficult to complete.

   D When the employee signs a waiver safeguarding the employer from prosecution if an injury should occur.

   E When the employee provides his/her own suitable PPE gear.

   ☐

9. 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.

   ☐

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

    A 100 kPa.

    B 500 kPa.

    C 1000 kPa.

    D 1500 kPa.

    E 2000 kPa.

    ☐

11. When is it permitted to bypass a backflow prevention device supplying an installation?

    A During maintenance procedures.

    B While testing of the backflow assembly takes place.

    C At non-peak usage times.

    D In an emergency fire-fighting situation where a high flow rate is required.

    E When the bypass has the same rating as the device being bypassed.

    ☐

12. Who is responsible for organising the periodic testing of a backflow prevention device?

A The local territorial authority.

B The installing plumber.

C The architect.

D The building owner.

E An independently qualified person.

13. What is the minimum time a hot water cylinder relief drain installed under a concrete slab must last to meet the durability requirements of the New Zealand Building Code?

A 1 year.

B 2 years.

C 5 years.

D 15 years.

E 50 years.

Total 13 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		
Section B		
Total		