

Affix label with Candidate Code
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Number if known

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No. 9195



Plumbers,
Gasfitters and
Drainlayers Board

REGISTRATION EXAMINATION, NOVEMBER 2012

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 17–21 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

Candidates that sat this examination in November 2012 were provided with the following documents:

- New Zealand Building Code clause G1 Personal Hygiene
- AS/NZS 3500 Part 1: Water services
- AS/NZS 3500 Part 2: Sanitary plumbing and drainage
- AS/NZS 3500 Part 4: Heated water services
- Guide for Safety with Underground Services

SECTION A

QUESTION 1

(a) Explain the purpose of a detector assembly on a backflow prevention device.

(1 mark)

(b) Explain back pressure in relation to backflow protection.

(2 marks)

(c) Explain back siphonage in relation to backflow protection.

(2 marks)

Total 5 marks

QUESTION 2

A plan view of a domestic dwelling, drawn to a scale of 1:100, is drawn on the opposite page. The plan shows showing the proposed layout for the cold water pipework for the dwelling.

The water main supply can provide 400 kPa water pressure and is situated 30 lineal metres away from entry point to the dwelling.

The shower is the highest outlet and is 4 vertical metres above the water main.

Using the procedure given in AS/NZ 3500 Part 1: Water services Appendix D, complete the tables below.

Index length	Pressure drop

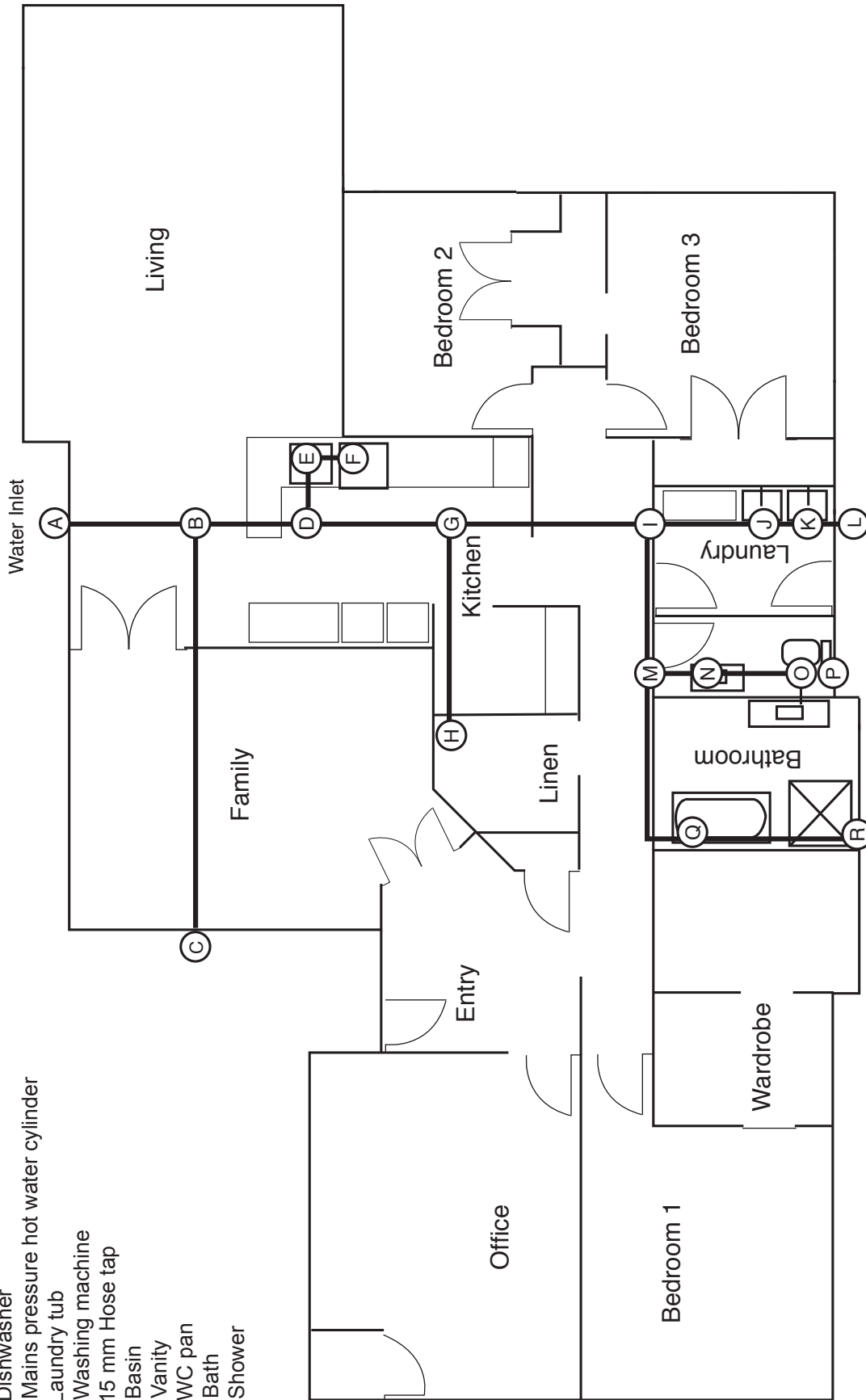
Pipe Section	Total Loading Units	Probable Simultaneous Flow Rate (L/s)	Pipe size DN
A-B			
B-C			
B-D			
D-E			
E-F			
D-G			
G-H			
G-I			
I-J			
J-K			
K-L			
I-M			
M-N			
N-O			
O-P			
M-Q			
Q-R			

Total 22 marks

QUESTION 2 (cont'd)

Legend

- C = 15 mm Hose tap
- E = Sink with aerated faucet
- F = Dishwasher
- H = Mains pressure hot water cylinder
- J = Laundry tub
- K = Washing machine
- L = 15 mm Hose tap
- N = Basin
- O = Vanity
- P = WC pan
- Q = Bath
- R = Shower



QUESTION 3

A new sports stadium is to be constructed.

The stadium is designed to seat 10,000 people and have separate male and female sanitary facilities.

- (a) Complete the tables below to show the minimum number of sanitary fixtures that must be provided for the stadium to comply with New Zealand Building Code Clause G1/AS1 Personal Hygiene.

Design number of males	Design number of females

Sanitary fixtures			
	WC Pans	Urinals	Basins
Female			
Male			

(14 marks)

- (b) State the minimum number of toilets that must be accessible for people with disabilities.
-

(1 mark)

Total 15 marks

QUESTION 4

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

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____

(5 marks)

(b) A forced solar water heating system is being designed so that it complies with AS/NZS 3500 Part 4: Heated water services.

The system's solar collector will have an area of 8 m².

State the minimum allowable capacity (litres/hr) of the pump.

(1 mark)

Total 6 marks

QUESTION 5

(a) The plan on the page opposite shows the layout of sanitary fixtures for a proposed dwelling.

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

The drainage design 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.

- (i) Draw on the plan the location of all discharge pipes and vents.
- (ii) Show on the plan the minimum allowable diameter for each section of discharge and vent pipe.

(9 marks)

(b) Complete the table to show the minimum allowable gradients for the pipe diameters listed.

Pipe diameter	Minimum Gradient
40 mm – 65 mm	
80 mm – 100 mm	

(1 mark)

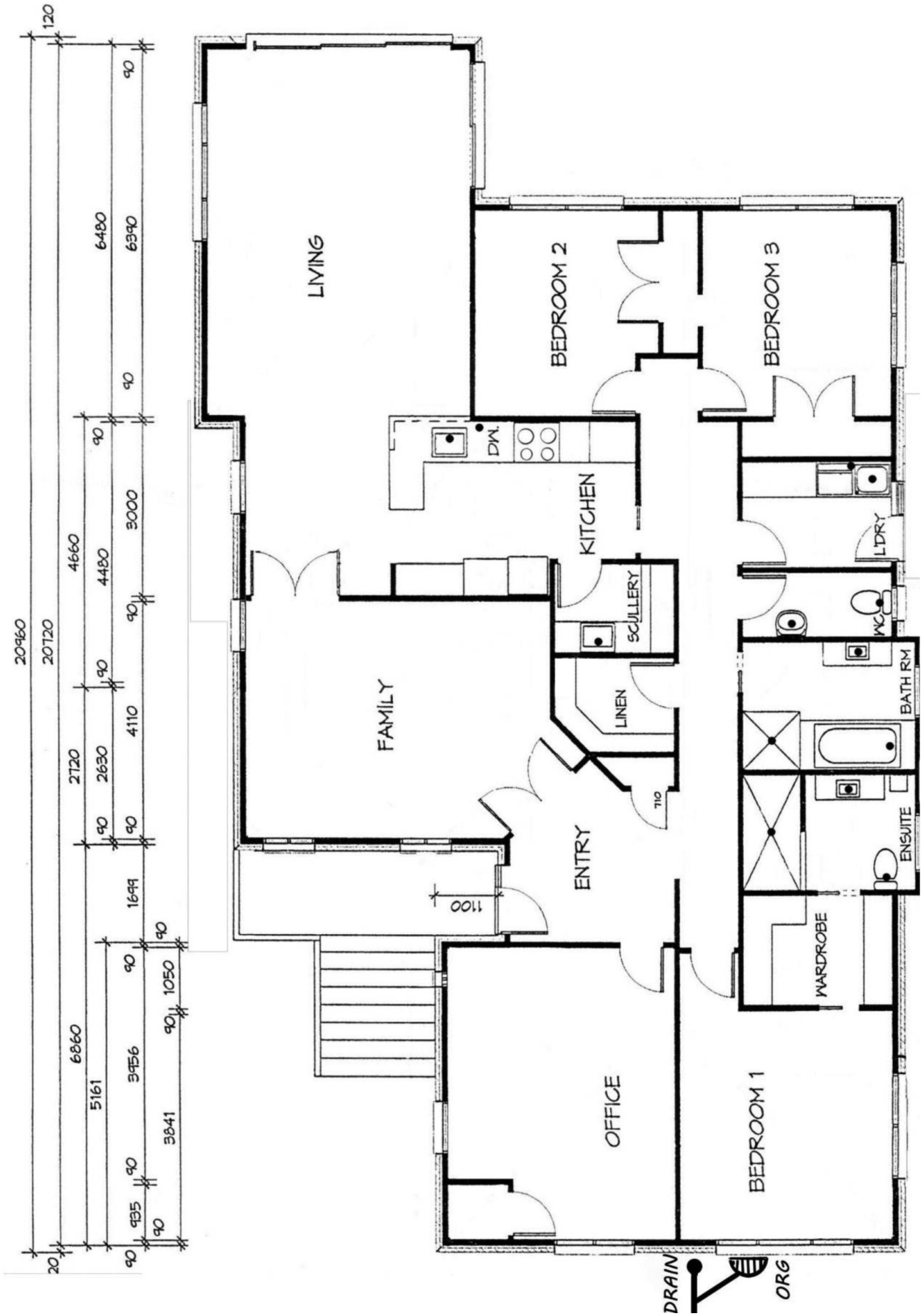
(c) Give SIX requirements that must be met when installing an untrapped floor waste to comply with AS/NZS 3500 Part 2: Sanitary plumbing and drainage.

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____

(3 marks)

Total 13 marks

QUESTION 5 (cont'd)



QUESTION 6

(a) Give FIVE items of information that must be provided to the Department of Labour when Notification of Particular Hazardous Work is required.

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____

(5 marks)

(b) State how much notice (time) must be given to the Department of Labour that notifiable work is to be carried out.

(1 marks)

(c) Give FOUR items that should be supplied to the person monitoring people working within a confined space in addition to standard personal protection equipment.

- 1 _____
- 2 _____
- 3 _____
- 4 _____

(4 marks)

QUESTION 6 (cont'd)

(d) Give FOUR reasons a plan showing the layout of buried pipework may not be a reliable source of information when locating underground services.

- 1 _____
- 2 _____
- 3 _____
- 4 _____

(4 marks)

Total 14 marks

QUESTION 7

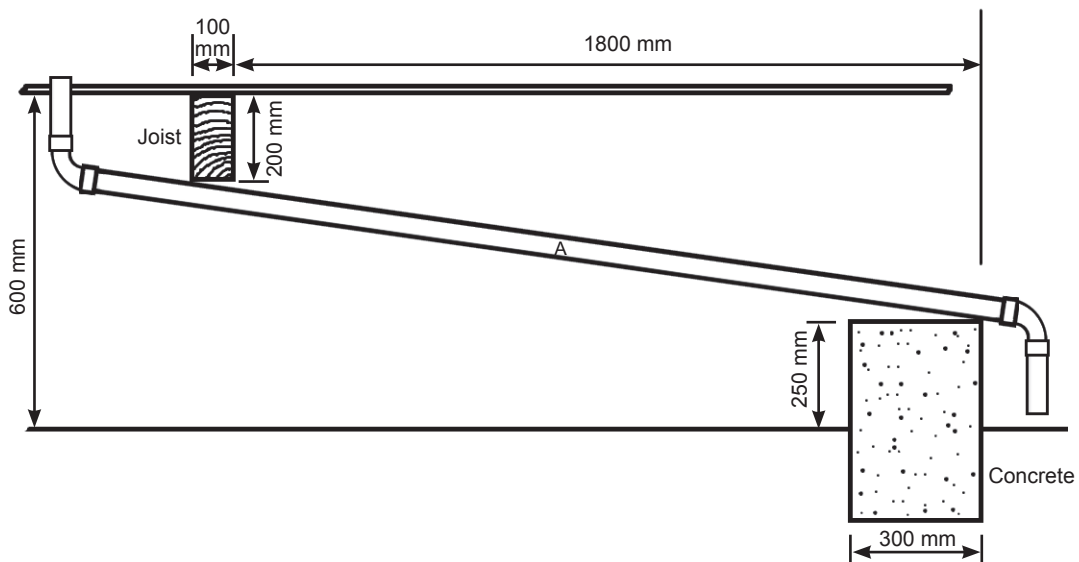
- (a) State the minimum separation distance permitted between gas and water supply pipework installed within a wall cavity.

(1 mark)

- (b) An electrical supply cable has been buried, protected and marked to comply with AS/NZS 2648.1. State the minimum separation distance permitted between the cable and a DN 80 water supply.

(1 mark)

- (c) The diagram below shows an elevation of 55 mm OD pipe (A) installed beneath the wooden floor of a dwelling.



Calculate the maximum gradient achievable for the pipe A without cutting the joist or the concrete.

(3 marks)

Total 5 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.

Note that should your choice of answer be unclear in this section of the examination no marks will be awarded for that question.

1. How is the required size of an air gap used to provide backflow prevention calculated?

- A $\frac{1}{2}$ the diameter of the inlet pipe.
- B Equal to the diameter of the inlet pipe.
- C $1.5 \times$ the diameter of the inlet pipe.
- D $2 \times$ the diameter of the inlet pipe.
- E $2.5 \times$ the diameter of the inlet pipe.

2. Which of the following requires the hot water supply to personal hygiene sanitary fixtures to be limited to 45°C ?

- A A prison.
- B A restaurant.
- C A domestic dwelling.
- D A laundromat.
- E A kindergarten or preschool.

3. A floor waste gully is receiving the waste from a basin, bath and shower.

What is the discharge unit rating of the floor waste gully?

- A 4
- B 5
- C 6
- D 7
- E 8

4. When must a soaker flashing be installed?

- A When the size of the roof penetration is greater than 85 mm diameter.
- B When the roof is in a high wind zone.
- C When the roof is constructed from tiles (concrete or slate).
- D When the average rainfall intensity for the area exceeds 42 mm/hr.
- E When the rainwater is going to be used as a potable water supply.

5. Within which distance from the top and bottom of a hot water storage cylinder must a seismic restraint be fitted?

- A 50 mm.
- B 75 mm.
- C 100 mm.
- D 150 mm.
- E 200 mm.

6. A third seismic restraint is required to be fitted to a hot water storage cylinder exceeding what capacity?

- A 150 litres.
- B 200 litres.
- C 250 litres.
- D 300 litres.
- E 350 litres.

7. Which of the following is the definition of a header vent?

- A A graded vent at any one floor level, interconnecting two or more individual trap vents or group vents.
- B A vent interconnecting the tops of two or more relief vents or stack vents.
- C A vent interconnecting a stack and its relief vent.
- D A vent that terminates above the roof level.
- E A vent installed at any floor level. It is provided for venting the traps of not more than two fixtures individually connected, and normally is a vertical extension of a graded pipe or branch.

8. What is the maximum diameter a header vent is required to be?

- A 50 mm.
- B 65 mm.
- C 80 mm.
- D 100 mm.
- E 300 mm.

9. How many litres of water per person must be stored for use when the water supply to a community care building is interrupted?

- A 50
- B 75
- C 100
- D 125
- E 150

10. Where would you most likely find a first flush divertor?

- A A commercial building that uses flushing valves to supply water to WC pans.
- B On the outlet of a urinal sparge pipe.
- C At the base of a downpipe feeding a storage water tank.
- D At the base of a newly installed drain that is about to be tested for soundness.
- E On the inlet to a single fixture waste water pump.

11. Which of the following best describes Approved Codes of Practice?

- A Alternative solutions to comply with the New Zealand Building Code.
- B Mandatory procedures that must be followed when carrying out certain tasks.
- C Acceptable solutions to enable compliance with the New Zealand Building Code.
- D Clauses contained within the Plumbers, Gasfitter and Drainlayers Act stating the supervision requirements for the holders of different license types.
- E Department of Labour preferred work practice guidelines.

12. 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 employees workplace.
 - D Provide all necessary personal protection equipment to employees.
 - E Monitor the employees' health and exposure to the hazard.

13. Plumber A has requested the assistance of a licensed plumber employed by Plumber B. Who is responsible for ensuring that the licensed plumber is capable of completing the proposed work safely?

- A Plumber A.
- B Plumber B.
- C The licensed employee plumber.
- D The Department on Labour.
- E Occupational Safety and Health.

14. 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 (e.g. gas and electricity).
- E To prevent serious damage to property.

15. The Department of Labour must be notified of a serious harm accident as soon as possible by phone or email.

How long from the time of the accident must written notification also be provided?

- A 24 hours.
- B 48 hours.
- C 3 days.
- D 5 days.
- E 7 days.

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

For what length of time must the trainee work in the presence of the certifying plumber?

- A 6 months.
- B 12 months.
- C 24 months.
- D 36 months.
- E Until such time as the trainee achieves registration.

17. Which type of underground service detector is most suitable for locating live electrical cables?

- A Radio frequency detectors
- B Hum detectors.
- C Transmitter-receiver instruments.
- D Metal detectors.
- E Divining rods.

18. When identifying underground services, which of the following colours is likely to indicate an electrical service?

- A Orange.
- B Red.
- C Green.
- D Purple.
- E Blue.

19. Mobile scaffolding is being used to complete an installation near overhead electricity lines.

How close is the scaffolding and associated equipment permitted to be to the electrical lines before consent must be sought from the electrical lines owner?

- A 2.0 m.
- B 2.5 m.
- C 3.0 m.
- D 3.5 m.
- E 4.0 m.

20. The location of an underground electrical cable has been marked on a paved surface.

A hand held power tool is required to break up the paved surface.

To avoid damage to the electrical cable, the tool should not be used within what distance of the marked location?

- A 200 mm.
- B 300 mm.
- C 400 mm.
- D 500 mm.
- E 600 mm.

Total 20 marks

For Examiner's use only

Question number	Marks	Marks
1		
2		
3		
4		
5		
6		
7		
Section B		
Total		