No. 9194

Plumbers, Gasfitters and Drainlayers Board

REGISTRATION EXAMINATION, NOVEMBER 2011
CERTIFYING COMMON

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 25 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 2011 were provided with the following documents:

- Approved Code of Practice for Safety in Excavation and Shafts for Foundations

- Health and Safety in Employment Regulations

SECTION A

QUESTION 1

Give FOUR factors that can reduce flow of a liquid in a straight pipe.

1 _____

2 _____

3 _____

4 _____

Total 2 marks ☐

QUESTION 2

(a) Give THREE requirements that must be met when an underground service that will cross over another underground service is being installed.

1 _____

_____

2 _____

_____

3 _____

_____

(3 marks) ☐

(b) State THREE ways in which underground steel pipes can be corroded.

1 _____

_____

2 _____

_____

3 _____

_____

(3 marks) ☐

(c) Give THREE methods of preventing corrosion of underground steel pipes.

1 _____

_____
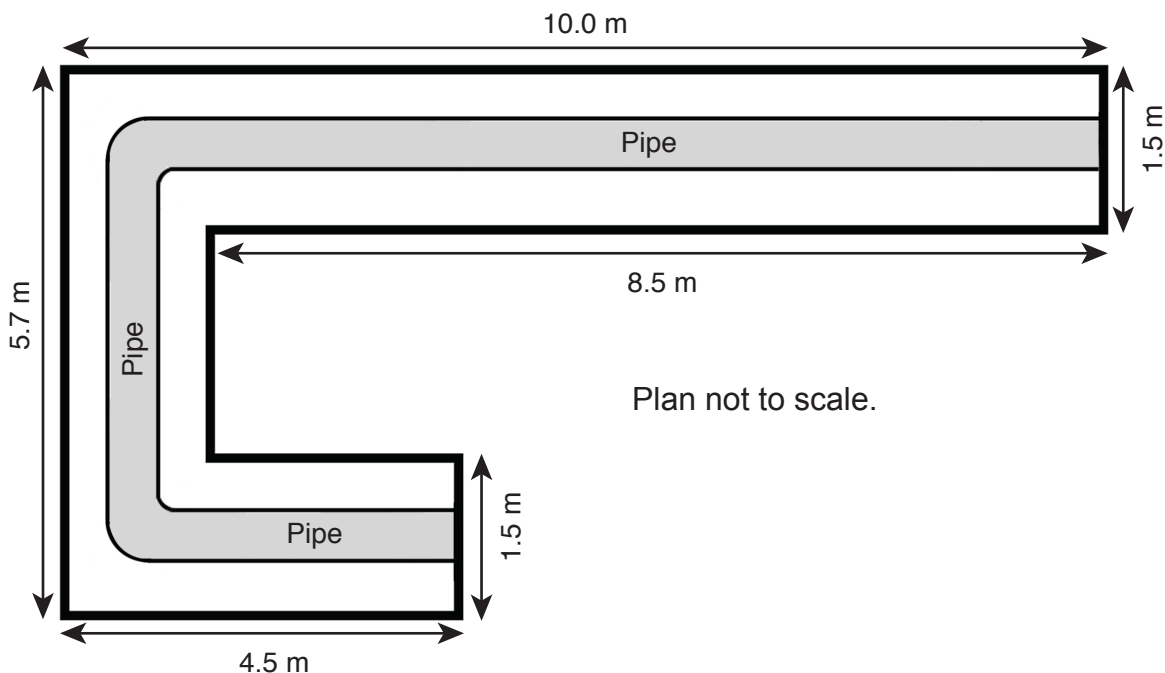
2 _____

_____

3 _____

_____

(3 marks) ☐

Total 9 marks ☐

QUESTION 3

A trench was excavated and pipework installed. The trench is ready for backfilling. The following diagram shows the situation.

Plan not to scale.

The depth of the trench is 800 mm.

The pipe in the trench has an outside diameter of 600 mm and a developed length of 17.2 m.

Calculate the volume of backfill required. Allow 20% for compaction.

_____

_____

_____

_____

_____

_____

_____

_____

Total 5 marks

QUESTION 4

Answer the following questions in relation to the Health and Safety in Employment Regulations.

(a)   In any place of work where any employee may fall more than 3 metres, employers are required to take actions to prevent this.

State TWO conditions these actions must meet.

1   _____

_____

2   _____

_____

(2 marks)

(b)   An employer must take particular actions with regard to shoring used in any excavation at a place of work.

Give FOUR conditions the shoring must meet.

1   _____

_____

2   _____

_____

3   _____

_____

4   _____

_____

(4 marks)

QUESTION 4 (cont'd)

(c)   An employer must take particular actions with regard to any excavation that is readily accessible to any person and that is likely to collect or retain water of such a depth as to constitute a danger to any person.

Give TWO such actions.

1   _____

   _____

2   _____

   _____

(2 marks) ☐

(d)   Work in which there is a risk that any person may fall 5 metres or more is generally notifiable work.

(i)   List SIX other kinds of construction work that are considered notifiable work under the Health and Safety in Employment Regulations.

1   _____

   _____

2   _____

   _____

3   _____

   _____

4   _____

   _____

5   _____

   _____

6   _____

   _____

(3 marks) ☐

QUESTION 4 (cont'd)

(d)   (ii)   Work in which a risk arises that any person may fall 5 metres or more is notifiable work except in some particular situations.

Give the FOUR exceptions.

1   _____

_____

2   _____

_____

3   _____

_____

4   _____

_____

(4 marks)

Total 15 marks

QUESTION 5

The plan below shows the layout for a piped system. The system is to be designed to receive a maximum of 20 litres/s from each inlet.

150 mm pipe has a maximum delivery 20 litres/s.
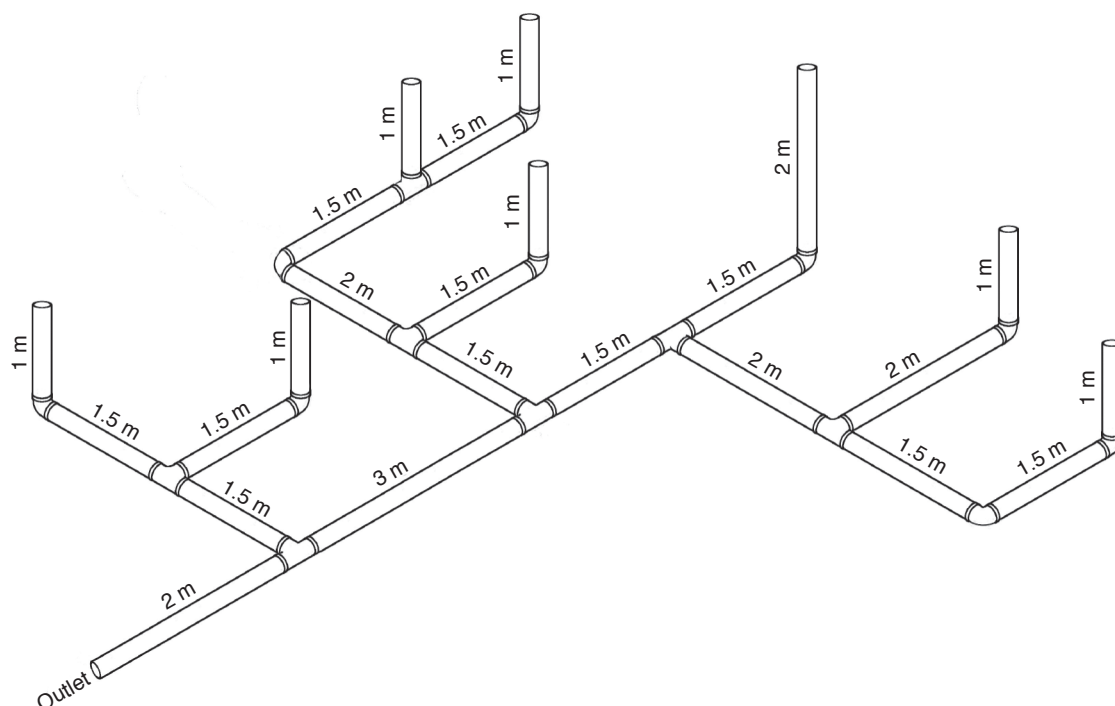200 mm pipe has a maximum delivery 50 litres/s.
250 mm pipe has a maximum delivery 120 litres/s.
300 mm pipe has a maximum delivery 220 litres/s.

All Joints are to be primed and sealed.

One container of jointing primer will prime 30 joints.
One container of jointing solvent will seal 20 joints.

Complete the table below by giving the quantities required for the system.

Pipe Lengths	Quantity	Fittings	Quantity
150 mm × 5 m		200 mm Tee Junction	
200 mm × 5 m		250 mm Tee Junction	
250 mm × 5 m		300 mm Tee Junction	
300 mm × 5 m		300 × 250 reducer	
		250 × 200 reducer	
Jointing Primer		200 × 150 reducer	
Jointing Solvent		150 mm Bend	
		200 mm Bend	

Total 14 marks

QUESTION 6

A high impact uPVC pipe is 25 m long. When the pipe is being installed, the temperature is 9ºC. Temperatures in the region can reach 36ºC.

Coefficient of linear expansion

Material	Coefficient of linear expansion per degree K Note: One degree K = 1°C
Polyethylene—	
low density	0·00028 or 280 × 10⁻⁶
high density	0·00011 to 0·00013
	or 110 × 10⁻⁶ to 130 × 10⁻⁶
Polyvinyl chloride (uPVC)—	
normal impact	0·00005 or 50 × 10⁻⁶
high impact	0·000081 or 81 × 10⁻⁶
Acrylonitrile butadiene	
styrene (ABS)	0·000083 to 0·000095
	or 83 × 10⁻⁶ to 95 × 10⁻⁶
Polypropylene	0·00011 or 110 × 10⁻⁶
Acrylics	0·00005 to 0·00009
	or 50 × 10⁻⁶ to 90 × 10⁻⁶
Nylon	0·00007 to 0·00001
	or 70 × 10⁻⁶ to 100 × 10⁻⁶
Lead	0·000029 or 29 × 10⁻⁶
Zinc	0·000035 or 35 × 10⁻⁶
Aluminium	0·000025 or 25 × 10⁻⁶
Brass	0·000018 or 18 × 10⁻⁶
Copper	0·0000166 or 16·6 × 10⁻⁶
Steel	0·0000133 or 13·3 × 10⁻⁶
Cast iron	0·0000106 or 10·6 × 10⁻⁶
Tin	0·000020 or 20 × 10⁻⁶

Referring to the table above, calculate in millimetres the maximum expansion that should be allowed for in the pipe.

Formula:

Expansion = L × C.L.E. × T

where
L = length
C.L.E. = coefficient of linear expansion
T = temperature difference

Total 3 marks

QUESTION 7

Give the meaning of each of the following terms in relation to the New Zealand Building Code.

(a) Verification Method _____

_____

_____

_____

(2 marks) ☐

(b) Alternative solution _____

_____

_____

_____

(2 marks) ☐

(c) Acceptable solution _____

_____

_____

_____

(2 marks) ☐

(d) Compliance documents _____

_____

_____
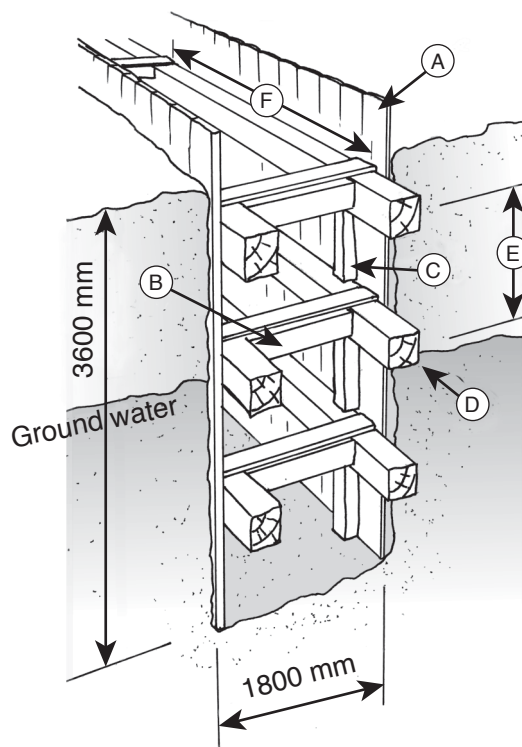
_____

(2 marks) ☐

Total 8 marks ☐

QUESTION 8

Sketch a diagram showing a pipe penetration of a concrete slab floor. Draw and label what must be done when the pipe penetrates the vapour barrier.

Total 3 marks

QUESTION 9

The following diagram shows an acceptable design for the construction of timber shoring for a trench.

Complete the table below.

Name of A	
Minimum dimensions of A	
Minimum horizontal spacing of A	
Name of B	
Minimum dimensions of B	
Name of C	
Name of D	
Minimum dimensions of D	
Measurement E	
Measurement F	

Total 5 marks

QUESTION 10

(a) The following diagram shows a pipe trench excavated adjacent to the foundation of an existing building.
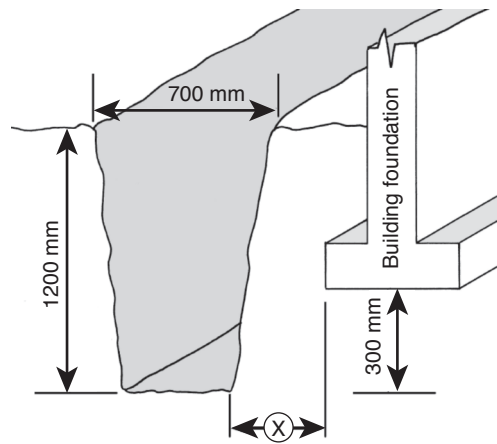
State the minimum horizontal distance between the base of the foundation and the bottom of the trench, indicated on the diagram as X, in the following circumstances.

(i) The trench will be open for less than 48 hours.

_____

(ii) The trench will be open for more than 48 hours.

_____

(2 marks)

QUESTION 10 (cont'd)

(b) A trench is to be excavated between two buildings in a central city area.

List SIX site or ground factors that should be considered before excavation commences.

1 _____

_____

2 _____

_____

3 _____

_____

4 _____

_____

5 _____

_____

6 _____

_____

(6 marks)

Total 8 marks

QUESTION 11

A new pipe installation is being pressure tested to ensure soundness.

List SIX items of information related to the test that should be recorded for future reference.

1 _____

_____

2 _____

_____

3 _____

_____

4 _____

_____

5 _____

_____

6 _____

_____

Total 6 marks

QUESTION 12

State the TWO purposes of the Plumbers, Gasfitters, and Drainlayers Act.

1 _____

_____

2 _____

_____

Total 2 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. Under to the Health and Safety in Employment Regulations, what is a spurred scaffold defined as?

    A   A catch net.

    B   A mast climber.

    C   Advanced scaffolding.

    D   Suspended scaffolding.

    E   Basic scaffolding.

2. When an employee is working temporarily for another contractor, who is responsible for ensuring that the employee is capable of doing the proposed work safely?

    A   The employee.

    B   The usual employer.

    C   The temporary employer.

    D   The Department of Labour.

    E   Occupational Safety and Health.

3. A contractor employs a scaffolder to erect scaffolding on a large building site.

    Who is responsible for the scaffolder's safety in terms of the Health & Safety in Employment Act?

    A   The scaffolder.

    B   The Department of Labour.

    C   The foreman on site.

    D   The contractor.

    E   Occupational Safety and Health.

4. Death is classified in the Health and Safety in Employment Act as which of the following?

    A Serious harm.

    B Severe harm.

    C Critical harm.

    D Significant harm.

    E Major harm.

    ☐

5. The safe slope of an excavation greater than 3 m in depth should not exceed which of the following?

    A 1 Vertical : 0.5 Horizontal or the angle of repose, whichever is flatter.

    B 1 Vertical : 2 Horizontal or the angle of repose, whichever is flatter.

    C 1.5 Vertical : 1 Horizontal or the angle of repose, whichever is flatter.

    D 1 Vertical : 1 Horizontal or the angle of repose, whichever is flatter.

    E 1 Vertical : 1.5 Horizontal or the angle of repose, whichever is flatter.

    ☐

6. Which is a correct formula for calculating the volume of a length of pipe?

    A $\pi \times R^2 \times L$

    B $\pi^2 \times R^2 \times L$

    C $\pi^2 \times R \times L$

    D $\pi \times D^2 \times L$

    E $\pi^2 \times D \times L$

    ☐

7. What is the maximum fine that could be imposed by the Plumbers, Gasfitters, and Drainlayers Board should a registered practitioner be found guilty of an offence under the Plumbers, Gasfitters, and Drainlayers Act 2006?

A $5,000

B $10,000

C $15,000

D $20,000

E $50,000

8. If an incident of serious harm occurs at work, the employer must as soon as possible notify the Department of Labour by phone or fax.

Within what time must written notification using the required form also be provided?

A 24 hours.

B 48 hours.

C 5 days.

D 7 days.

E 14 days.

9. Under the Health and Safety in Employment Act, to whom is a hazard notice issued?

A The site foreman.

B The territorial authority.

C The building inspector.

D The employee.

E The employer.

10. Every employer who intends to commence any notifiable work must take all practicable steps to lodge notice in writing by what length of time before work commences?

    A   At least 8 hours.

    B   At least 12 hours.

    C   At least 24 hours.

    D   At least 26 hours.

    E   At least 48 hours.

11. A certifying practitioner ceases to supervise a person by notifying the Plumbers, Gasfitters and Drainlayers Board in writing.

    The certifier is responsible for the work of the supervised person until when?

    A   The notification is received by the board.

    B   The notification is signed by the certifier.

    C   The certifier informs the supervised person.

    D   The end of the licensing year.

    E   The notification is signed by the supervised person.

12. Unless alternative arrangements are made with the building consent authority, a building consent lapses if the building work does not start within what period?

    A   6 months.

    B   12 months.

    C   24 months.

    D   36 months.

    E   48 months.

13. Unless an agreed extension has been arranged, an application for a Code of Compliance Certificate is required by a building consent authority within what length of time after the building consent was issued?

A   6 months.

B   12 months.

C   24 months.

D   36 months.

E   48 months.

14. Under the Safety in Excavation and Shafts for Foundations Code of Practice, when the slope of an excavation is benched, the bench adjacent to the work area should not exceed what height?

A   0.5 m

B   0.6 m

C   1.0 m

D   1.5 m

E   2.0 m

15. An excavation is 2 m deep, and shoring has been used which is not designed for surcharge loads.

Under the Safety in Excavation and Shafts for Foundations Code of Practice, what is the minimum distance a vehicle may approach the edge of the excavation?

A   0.6 m

B   1.0 m

C   1.6 m

D   2.0 m

E   2.6 m

16. The Safety in Excavation and Shafts for Foundations Code of Practice advises a minimum safe clearance distance between workers while they are using hand tools.

    What is that minimum distance?

    A   0.6 m

    B   1.0 m

    C   1.5 m

    D   2.0 m

    E   2.4 m

17. Under the Safety in Excavation and Shafts for Foundations Code of Practice, what is the gradient of the steepest ramp that can be used for access into a deep excavation when traction cleats are used?

    A   1 in 4

    B   1 in 5

    C   1 in 6

    D   1 in 7

    E   1 in 8

18. A gas naturally smells like rotten eggs, but people's sense of smell is lost in large concentrations so that it cannot be detected.

    What is the gas?

    A   Methane.

    B   Propane.

    C   Ethane.

    D   Carbon dioxide.

    E   Hydrogen sulphide.

19. What are bills that have been passed by Parliament and have received the Royal Assent referred to as?

   A   Regulations.

   B   Standards.

   C   Codes.

   D   Acts.

   E   Approvals.

   ☐

20. What is a law-making action made under the delegated authority of an Act is referred to as?

   A   Regulation.

   B   Standard.

   C   Code.

   D   Clause.

   E   Bill.

   ☐

Total 20 marks ☐