No. 9194

Plumbers, Gasfitters and Drainlayers Board

CRAFTSMAN EXAMINATION, JUNE 2007
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, ask the Supervisor for extra sheets. Write your Candidate Code Number and the number 9194 on any extra sheets used, and attach them to this booklet. NO SEPARATE ANSWER BOOKLET IS TO BE USED. Write the number of extra sheets used in the box on the last page of this booklet. Write NIL if you have not used any.

All working in calculations must be shown.

Candidates are permitted to use the following in this examination:

Drawing instruments, approved calculators

**The following are NOT permitted in the examination room:**

Any publications, Acts, Regulations, Codes of Practice, or Standards

Check that this booklet has all of l7 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

QUESTION 1

(a) Using your knowledge of NZS 3604 state THREE requirements that must be met when forming an opening in foundation walls.

1 _____

_____

2 _____

_____

3 _____

_____

(3 marks)

(b) Where a notch or hole size exceeds the 25 mm dimensions in the timber top plate, the plate must be strengthened. Sketch a method to strengthen the plate as described in NZS 3604 Timber Framed Buildings.

(2 marks)

Total 5 marks

QUESTION 2

(a) A gas low pressure hot water heating boiler is to be used to heat a dwelling with hot water radiators. A floor plan of the dwelling is as follows.
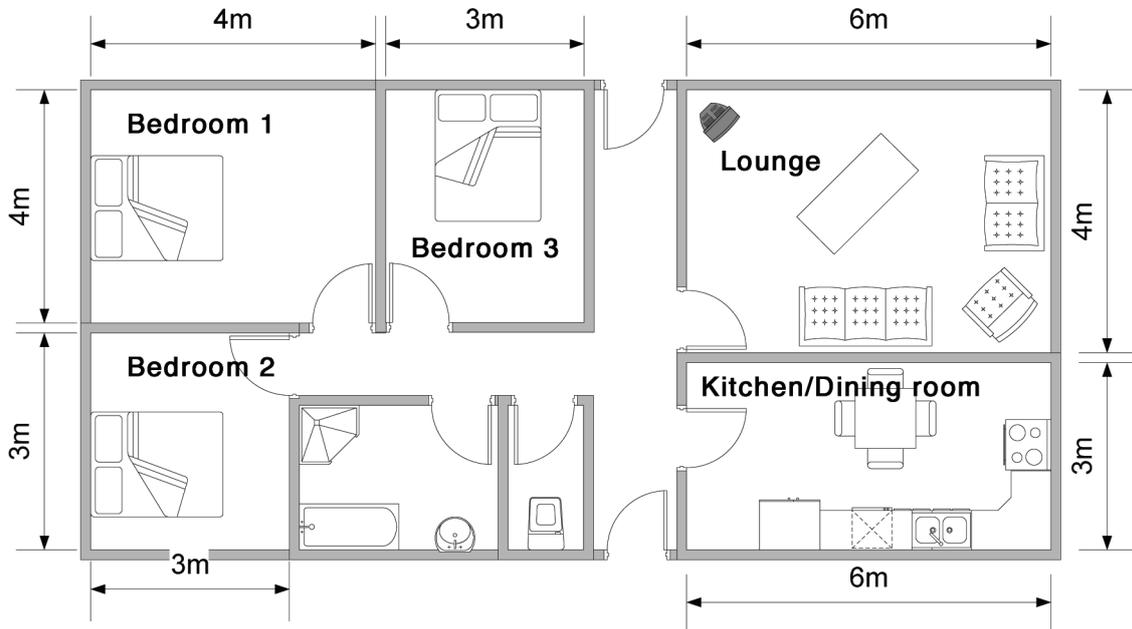
The ceiling height is 2.4m.
The radiators are sectional and each section has an output of 199 watts.
For bedrooms allow 40 watts/m³ of air space.
For living areas allow 50 watts/m³ of air space.

Showing all working calculate how many radiator sections are required for:

Bedroom 1 _____

_____

Bedroom 2 _____

_____

Bedroom 3 _____

_____

Lounge room _____

_____

Kitchen/Dining room _____

_____

(5 marks)

QUESTION 2 (cont'd)

(b) The gas boiler for this installation has an efficiency rating of 83%. Calculate the input rating of the boiler that is required.

_____

_____

_____

_____

_____

_____

_____

(5 marks)

Total 10 marks

QUESTION 3

A sub-contractor has secured a contract for an apartment building comprising 70 apartment units. Each unit has two appliances each with a weight of 300 kilograms. One morning the site foreman tells the sub-contractor that all of the appliances are to be altered from floor mounted to wall mounted. He tells the sub-contractor that he will authorise the variation and the work can be done on a cost-plus basis. He asks the sub-contractor to begin the work immediately.

Your answer must only consider contract and consent implications.

(a)   Detail what implications the variation raises in terms of the existing plan and consent.

_____

_____

_____

_____

_____

(3 marks)

(b)   Explain how the sub-contractor should respond to the foreman.

_____

_____

_____

_____

_____

(2 marks)

(c)   Explain what consent and contractual processes, if any, are required.

_____

_____

_____

_____

_____

(5 marks)

Total 10 marks

QUESTION 4

(a) Describe a method which can be used to check that the labour component estimated to complete a project is as accurate as possible prior to submitting a tender.

_____

_____

_____

_____

_____

_____

(2 marks)

(b) State SIX elements of a detailed estimate to price a tender or contract bid.

1 _____

_____

2 _____

_____

3 _____

_____

4 _____

_____

5 _____

_____

6 _____

_____

(6 marks)

QUESTION 4 (cont'd)

(c) Explain why preliminary estimates are prepared as part of the design process of a building project.

_____

_____

(1 mark)

Total 9 marks

QUESTION 5

(a) List FIVE considerations that may have an impact on a small existing business prior to tendering for a major contract.

1 _____

2 _____

3 _____

4 _____

5 _____

(5 marks) ☐

(b) Other than charge-up, state THREE contractual terms used to describe the value of a plumbing and/or gasfitting contract.

1 _____

2 _____

3 _____

(3 marks) ☐

Total 8 marks ☐

QUESTION 6

The diagram below shows a storage water heater with an uncontrolled energy source.
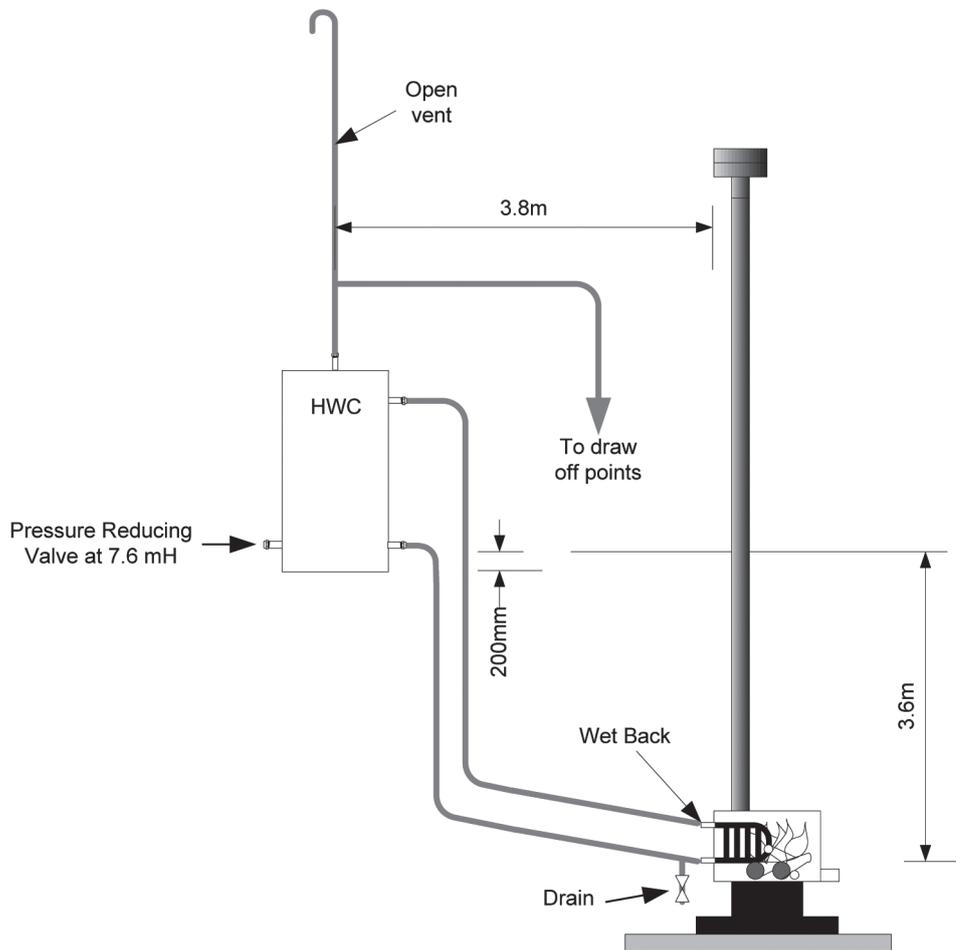
The following table is to be used to size the circulating pipes.

| Y | Minimal nominal diameter, DN | | | | |
| | X, m | | | | |
m	2	4	6	8	10
1	20	20	25	32	32
2	20	20	25	32	32
3	20	20	20	25	32
4	18	20	20	25	25
5	18	20	20	20	25
6	18	18	20	20	25

Note: X is the true horizontal distance and Y is the true vertical distance.

QUESTION 6 (cont'd)

Determine each of the following:

(a)   the size of the circulating pipes

_____

_____

(2 marks)

(b)   the height of the vent pipe using the formula $H = \dfrac{SP}{10} + 1$

where   H   =   the height of the vent pipe, in metres.

SP   =   set outlet pressure of the reducing valve, in kilopascals

_____

_____

_____

_____

(1 mark)

(c)   the pressure on the base of the hot water cylinder

_____

_____

_____

(1 ½ marks)

(d)   the static pressure in the wetback

_____

_____

_____

(1 ½ marks)

Total 6 marks

QUESTION 7

The diagram below shows a water service pipe feeding a tank.
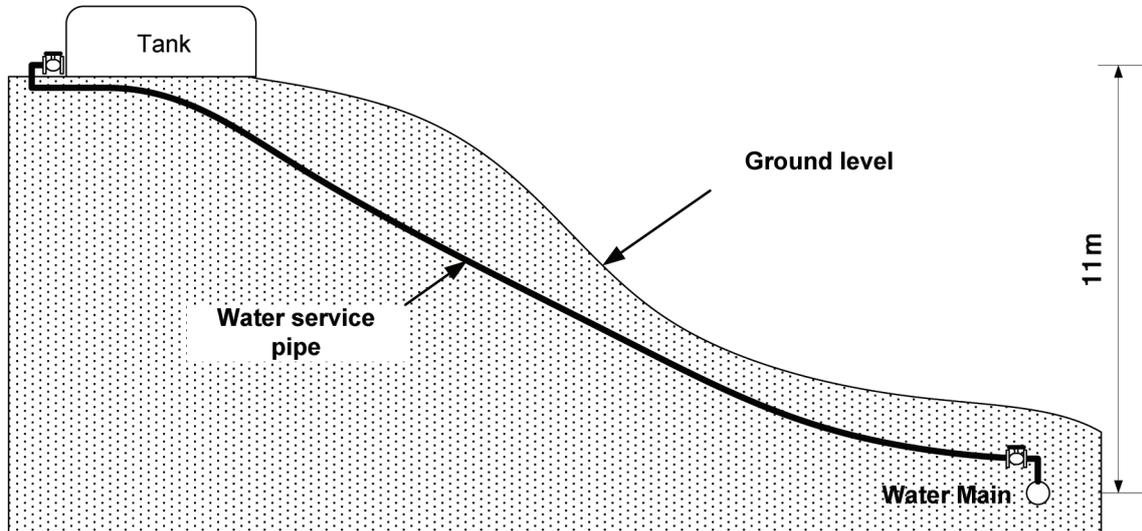
The pressure available from the main is 350kPa.

The service pipe length is 62m and the water requirement at the tank entry is 36 litres/minute.

Using the formula $q^2 25L = d^5 H$

where   q = discharge in litres per second

         d = ID in centimetres

         H = head of water in metres

         L = length in metres

calculate the internal diameter of the water service pipe from the utility water main to the tank.

Use the conversion 1 metre head = 10kPa.

QUESTION 7 (cont'd)

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Total 6 marks

QUESTION 8

(a) State the reason for restricting any excavation close to a foundation wall.

_____

_____

(1 mark)

(b) In the event of a person being seriously harmed on a site under your control

(i) state what authority the accident must be reported to

_____

(ii) state the maximum number of days within which written notice must be provided to this authority.

_____

(2 marks)

(c) A plumber employs a trenching machine operator.

In terms of the Health and Safety in Employment Act, state who is responsible for the trenching machine operator's safety.

_____

(1 mark)

(d) In terms of the Health and Safety in Employment Act, state who the principal contractor is in a contract between a plumber and a trenching company.

_____

(1 mark)

(e) After finding and identifying a significant hazard, state the THREE options that are available for controlling it.

1 _____

2 _____

3 _____

(1 mark)

Total 6 marks

QUESTION 9

(a) List TEN responsibilities that employers have under the Health and Safety in Employment Act to maintain a safe working environment.

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

8 _____

9 _____

10 _____

(5 marks)

(b) List FOUR steps required before cutting into an existing water OR gas pipe which is already exposed.

1 _____

2 _____

3 _____

4 _____

(2 marks)

Total 7 marks

QUESTION 10

(a) A house owner has imported a new proprietary system of piping to install the water and gas pipes for his house. The Territorial Authority has refused to approve the product, as the system does not conform to the Building Code. As the owner still wishes to use this system, state TWO actions available to the owner.

1 _____

_____

2 _____

_____

(2 marks) ☐

(b) State TWO requirements a company or manufacturer must meet when using a New Zealand Standards Mark on their product.

1 _____

2 _____

(2 marks) ☐

(c) List FOUR activities relevant to plumbers and gasfitters that are undertaken by the New Zealand Building Industry Authority (Department of Building and Housing).

1 _____

_____

2 _____

_____

3 _____

_____

4 _____

_____

(4 marks) ☐

Total 8 marks ☐

QUESTION 11

(a) State SEVEN important factors in relation to the business, excluding legislation, that should be considered before submitting a tender for a major contract.

1 _____

_____

2 _____

_____

3 _____

_____

4 _____

_____

5 _____

_____

6 _____

_____

7 _____

_____

(7 marks) ☐

(b) State in general terms the THREE main items to be considered in calculating an hourly charge-out rate.

1 _____

2 _____

3 _____

(3 marks) ☐

Total 10 marks ☐

QUESTION 12

(a)   State FIVE duties of an Industry Training Organisation (ITO).

1   _____

2   _____

3   _____

4   _____

5   _____

(5 marks) ☐

(b)   List FIVE factors that should be considered when a training organisation is assessing an employer for suitability to train apprentices.

1   _____

2   _____

3   _____

4   _____

5   _____

(5 marks) ☐

Total 10 marks ☐

QUESTION 13

List FIVE advantages of being a member of a nationally recognised trade association.

1 _____

2 _____

3 _____

4 _____

5 _____

Total 5 marks ☐

For Candidate's use

Number of EXTRA sheets used (write NIL if none have been used).	

For Examiner's use only

Questions Answered	Marks	Marks
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
Total		