

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

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No. 9194



Plumbers,  
Gasfitters and  
Drainlayers Board

## CRAFTSMAN EXAMINATION, NOVEMBER 2009

### 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 19–21 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.

**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 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**



## QUESTION 1

List FIVE functional or performance requirements of fire protection in a building as given in the New Zealand Building Code.

1 \_\_\_\_\_  
\_\_\_\_\_

2 \_\_\_\_\_  
\_\_\_\_\_

3 \_\_\_\_\_  
\_\_\_\_\_

4 \_\_\_\_\_  
\_\_\_\_\_

5 \_\_\_\_\_  
\_\_\_\_\_

Total 5 marks

**QUESTION 2**

- (a) When formulating a progress claim for an ongoing contract, certain elements are used to establish the amount charged out.

List FIVE of these elements. Do not include individual items such as tapware.

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_
- 5 \_\_\_\_\_

(5 marks)

- (b) Give FOUR reasons why an extension of time to complete a contract may be granted.

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_

(4 marks)

- (c) (i) Give the meaning of the term liquidated damages.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(2 marks)

**QUESTION 2 (cont'd)**

(ii) Explain how the value of liquidated damages is estimated.

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(2 marks)

**Total 13 marks**

**QUESTION 3**

- (a) A ventilation system is to be designed for a building. The system must be able to collect or remove airborne products from the spaces to be ventilated.

List SIX of these airborne products as given in the New Zealand Building Code Clause G4 Ventilation.

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

4 \_\_\_\_\_

5 \_\_\_\_\_

6 \_\_\_\_\_

(6 marks)

- (b) A canteen at a factory has a maximum of sixty five occupants at any one time. The canteen is 10.500m wide and 12.250m long, and has a ceiling height of 2.700m. Each occupant requires 28m<sup>3</sup> of air per hour.

Calculate the number of air changes required each hour the canteen is in use.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(3 marks)

**Total 9 marks**

**QUESTION 4**

(a) Give the meaning of the following terms in relation to a building subcontract.

(i) Contingency sum.

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(1 mark)

(ii) Prime cost or net sum.

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(1 mark)

(iii) Provisional sum.

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(1 mark)

(b) Give the reason that the sums in (a) are used in building subcontract documents.

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(1 mark)

(c) Explain how the final account is affected by the sums in (a) being included in the building subcontract documents.

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(2 marks)

**Total 6 marks**

## QUESTION 5

A quantity surveyor has used the standard method of measurement for building work to prepare a schedule of quantities for tender purposes.

- (a) (i) List the FOUR main components to be included when calculating a unit rate for the supply and installation of pipework up to and including 20mm diameter.

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

4 \_\_\_\_\_

(2 marks)

- (ii) List the THREE main components to be included when calculating a unit rate for the supply and installation of pipework 25mm diameter and above.

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

(1½ marks)

- (b) Name the author (provider) of the following plans or drawings.

- (i) Contract drawings.

\_\_\_\_\_

- (ii) Plumbing or gasfitting designs.

\_\_\_\_\_

- (iii) Workshop drawings.

\_\_\_\_\_

(1½ marks)

**Total 5 marks**

## QUESTION 6

Pipework of 75mm diameter is to be installed.

The installation consists of

- 63m of polyethylene pipe
- 124m of steel pipe
- 44m of copper pipe.

The required flow rate is 315 litres per minute.

Using the table below, calculate the total friction loss in the pipework. Give your answer in metres.

<b>75mm pipe – friction loss in metres per 100 metres</b>			
<b>Flow rate in l/m</b>	<b>Steel pipe</b>	<b>Copper pipe</b>	<b>Polyethylene pipe</b>
225	0.7	0.8	0.6
270	1.0	1.1	0.9
315	1.3	1.5	1.2
360	1.7	1.8	1.5
405	2.1	2.3	1.8
450	2.5	2.7	2.2
675	5.3	5.7	4.8
900	9.1	9.5	8.1

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Total 4 marks

## QUESTION 7

(a) To comply with the Health and Safety in Employment Act, the workplace environment must be monitored.

(i) List THREE environmental conditions that must be monitored.

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_

(3 marks)

(ii) Give THREE reasons for carrying out environmental monitoring in the work place.

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_

(3 marks)

(b) Fluid is moved through a pipework system by pressure. Some of the energy generated by the pressure needed to provide this movement will be lost.

List FIVE different factors that cause this energy loss.

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_
- 5 \_\_\_\_\_

(2½ marks)

**QUESTION 7 (cont'd)**

(c) A supply piping system is to be designed.

List FIVE items of information that must be established before the system can be designed.

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_
- 5 \_\_\_\_\_

(2½ marks)

**Total 11 marks**

**QUESTION 8**

(a) Department of Labour Inspectors may issue notices when they discover breaches of the Health and Safety in Employment Act.

Briefly describe the purpose of each of the following types of notice.

(i) Inspector's notice.

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(ii) Improvement notice.

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(iii) Prohibition notice.

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(iv) Suspension notice.

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(v) Infringement notice.

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(5 marks)

**QUESTION 8 (cont'd)**

- (b) State which of the notices in (a) can be appealed against by the party to whom the notice is issued.
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(1 mark)

**Total 6 marks**

**QUESTION 9**

(a) (i) State the atmospheric pressure at sea level.

\_\_\_\_\_

(ii) Define gauge pressure.

\_\_\_\_\_

(iii) Define absolute pressure.

\_\_\_\_\_

(3 marks)

(b) Employers must comply with the First Aid Regulations as part of workplace health and safety.

State THREE of the requirements employers must meet under these regulations.

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

(3 marks)

**Total 6 marks**

**QUESTION 10**

(a) Briefly describe each of the following types of codes or standards as used in the plumbing and gasfitting industries.

(i) A prescriptive code or standard.

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(2 marks)

(ii) A performance based code or standard.

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(2 marks)

(b) (i) Briefly explain the purpose of verification of a performance based code or standard.

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(1 marks)

(ii) State the methods of verification of a performance based code or standard.

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(2 marks)

(c) A plumbing and gasfitting company wishes to use an alternative method of installation not verified or covered by an acceptable solution.

State the organisation to which the company should make an application for approval for the alternative method to be used.

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(1 marks)

**Total 8 marks**

## QUESTION 11

A sole trader plumber and gasfitter needs to calculate a suitable charge out rate for services.

An annual gross salary of \$75 000.00 per year is to be allowed for.

Total hours worked per week are to be 45.

Statutory holidays, annual holidays and sick days per annum are to total 240 hours.

Non-chargeable hours are to total 315 hours per annum.

A profit margin of 10% is to be allowed for.

Annual overheads are as follows:

	\$
Accounting fees	2300
ACC levies	3750
Advertising	2500
Bad debts	1250
Depreciation	5500
Insurance	2300
Bank interest and charges	3500
Uniforms	200
Postage	300
Power and gas	2400
Printing and stationery	1250
Rent for premises	10000
Repairs and maintenance	750
Rubbish removal and dumping charges	300
Subscriptions	800
Telephone and internet charges	2500
Vehicle expenses	5000
Sundries	1000

Calculate the charge out rate the sole trader should use.

Formula:

Charge out rate = [(labour costs + overheads) ÷ chargeable hours] + profit %

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Total 7 marks

**QUESTION 12**

Explain the straight line method of calculating depreciation.

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**Total 5 marks**

**QUESTION 13**

Explain the meaning of the following terms as they apply to contracts.

(a) Variations.

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(b) Sectional completion.

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(c) Time for practical completion.

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(d) Fluctuation.

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**Total 8 marks**

**QUESTION 14**

State TWO occasions when the registered name of a company must be used.

1 \_\_\_\_\_

\_\_\_\_\_

2 \_\_\_\_\_

\_\_\_\_\_

**Total 2 marks**

### QUESTION 15

As an employee, it is reasonable to have certain expectations regarding your employment.

Give FIVE such fair and reasonable expectations.

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_
- 5 \_\_\_\_\_

**Total 5 marks**







For Examiner's use only

Question number	Marks	Marks
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Total		