

Affix label with Candidate Code
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Number if known

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No. 9194



Plumbers,
Gasfitters and
Drainlayers Board

CRAFTSMAN EXAMINATION, JUNE 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 the blank pages at the back of this booklet. Clearly write the question number 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

A room used for entertainment purposes requires 28m^3 of fresh air per person for every hour the room is in use.

The dimensions of the room are 24.200m long, 22.500m wide and 3.500m high.

The ventilation system provides five air changes per hour.

Calculate the maximum number of persons who are able to use the room at any one time.

Total 3 marks

QUESTION 2

A 80mm copper pipe is to be retrofitted through a factory roof space. It must be suspended from the existing roof trusses.

- The pipe and contents weigh (have mass) 7.60 kg/m.
- The existing roof trusses are 4.750m apart.
- The length of the pipe run is 40.750m.
- 1 kilonewton (kN) = 102 kg-force.

(a) Calculate the total load to be suspended from the structure.

(1 mark)

(b) Calculate the required load capacity of the pipe support on the centre truss, including an allowance for a 15% safety margin. Give your answer in kilonewtons (kN).

(2 marks)

(c) The ambient temperature in the roof space varies from 2°C to 38°C. The coefficient of expansion for copper is 0.000017 per °C.

Calculate (in mm) the amount of expansion of the pipe that must be allowed for.

(2 marks)

Total 5 marks

QUESTION 3

A building measures 8.000m by 4.500m and has a ceiling height of 2.400m.

The temperature inside the building is 20°C and the temperature outside the building is 6°C.

(a) Complete the table below to calculate the total heat loss through the building structure.

Component	Area (m ²)	U Value	Temperature Variation	Heat Loss (Watts)
Floor	36	1.7		
Ceiling	36	3.2		
Windows	6	5.7		
Doors	4	2.3		
Walls	50	2.5		
Total				

(4 marks)

(b) Calculate the heat energy required to maintain the temperature inside the building at 20°C if there will be six air changes per hour.

The specific heat of air is 1.2 kJ/m³/°C.

Formula:

$$\text{Energy (kW)} = \frac{\text{volume} \times \text{specific heat of air} \times \text{number of air changes} \times \text{temp. difference}}{3600}$$

(3 marks)

Total 7 marks

QUESTION 4

The following are the four main types of contracts used in the building and construction industry.

Describe the main features of each.

(a) Charge up or day-work.

(2 marks)

(b) Cost plus (or cost reimbursement).

(2 marks)

(c) Remeasure or measure and value (based on a schedule).

(2 marks)

(d) Fixed price or lump sum.

(2 marks)

Total 8 marks

QUESTION 5

A progress claim is to be prepared for a contract.

Using the amounts below, set out the claim form and calculate the GST exclusive total of the claim. None of the amounts shown include GST.

- Value of work completed \$ 14 892.00
- Materials on site but not yet installed \$ 23 456.00
- Variations (deduction) \$ 3 750.00
- Fluctuations \$ 435.00
- Contract price \$ 87 637.00
- Total of previous invoices \$ 7 906.00

Total 6 marks

QUESTION 6

Weekly job reports for a commercial contract are to be made to a company contract manager.

List EIGHT items of information that should be included in these reports.

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

Total 8 marks

QUESTION 7

(a) State the meaning of the term contra charges.

(1 mark)

(b) Give an example of an action that could lead to a contra charge.

(1 mark)

Total 2 marks

QUESTION 8

(a) A pipework installation consists of:

- 24m of 15mm NB pipe
- 32m of 25mm NB pipe
- 18m of 50mm NB pipe

Calculate, in litres, the total volume of fluid that could be contained in the pipework.

(3 marks)

(b) Calculate the discharge power of an 80mm NB pipe compared with the discharge power of a 40mm NB pipe.

Formula:

$$\text{Discharge power} = \sqrt{D^5}$$

where

D = diameter

(5 marks)

Total 8 marks

QUESTION 9

Answer the following in relation to the Health and Safety in Employment Act.

(a) Explain the meaning of the term hazard notice.

(2 marks)

(b) State who is able to issue a hazard notice.

(1 mark)

(c) State the party to whom the hazard notice is issued.

(1 mark)

(d) State whether or not a hazard notice is enforceable.

(1 mark)

(e) State the initial step that must be taken before a hazard notice can be issued.

(1 mark)

Total 6 marks

QUESTION 10

- (a) A plumbing and gasfitting company has employed new tradespersons. Before the new tradespersons commence their employment, there is a requirement under the Health and Safety in Employment Act for them to be given a briefing relating to workplace health and safety.

Give FOUR aspects that must be covered in the briefing.

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

(4 marks)

- (b) A plumbing and gasfitting company supplies equipment and plant for its employees to use in the workplace.

List THREE precautions that the company should observe with plant and equipment in order to comply with the Health and Safety in Employment Act.

- 1 _____
- 2 _____
- 3 _____

(3 marks)

QUESTION 10 (cont'd)

- (c) A plumbing and gasfitting company with fewer than twenty five employees is required to develop a Safety Management System.

List and briefly describe FOUR sections that must be included in the Safety Management Plan.

1 _____

2 _____

3 _____

4 _____

(4 marks)

Total 11 marks

QUESTION 11

A plumber/gasfitter is to test a completed pipework installation.

List SIX items that should be recorded for future reference.

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

Total 6 marks

QUESTION 12

Answer the following questions in relation to the New Zealand Building Code.

(a) Explain what is meant by the term acceptable solution.

(1 mark)

(b) Explain what is meant by an alternative solution.

(2 marks)

(c) Explain what is meant by a producer statement.

(2 marks)

Total 5 marks

QUESTION 13

(a) Explain the following terms in relation to business accounting, and explain how the information that results is used.

(i) Financial accounting.

(2 marks)

(ii) Cost accounting (in relation to completed contracts).

(2 marks)

(b) A chartered accountant uses the documentation provided by a plumbing and gasfitting company to produce the annual accounts for the company's trading during the past year.

List THREE key information outcomes that can be obtained from these accounts.

1

2

3

(3 marks)

QUESTION 13 (cont'd)

- (c) A chartered accountant has prepared the annual accounts for a plumbing and gasfitting company. In order to compare the year's figures with those of the previous year, two methods may be used.

These are as given below.

Explain each of the methods.

- (i) The historical method.

(1 mark)

- (ii) The percentage or ratio analysis method.

(1 mark)

Total 9 marks

QUESTION 14

- (a) The Privacy Act covers the use of information relating to a company's employees and customers.

State the THREE principles that govern the collection, use and disclosure of personal information.

1 _____

2 _____

3 _____

(3 marks)

- (b) The Consumer Guarantees Act covers the provision of services.

Give THREE examples of the conditions a service provider is required to meet under this Act.

1 _____

2 _____

3 _____

(3 marks)

QUESTION 14 (cont'd)

(c) A plumber/gasfitter supplies and installs an appliance. After three months the appliance fails.

State FOUR remedial actions that the consumer can expect from the installer, supplier and manufacturer of the appliance.

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

(4 marks)

(d) An employer wishes to include disciplinary conditions in an employment agreement. The disciplinary conditions are to provide grounds for dismissal.

List SIX conditions that could be included under these provisions.

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

(6 marks)

Total 16 marks

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For Examiner's use only

Question number	Marks	Marks
1		
2		
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