

Affix label with Candidate Code
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Number if known

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No. 9194



Plumbers,
Gasfitters and
Drainlayers Board

REGISTRATION EXAMINATION, NOVEMBER 2010

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 18–21 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 2010 were provided with the following documents:

- New Zealand Building Code clause E2 External Moisture
- Health and Safety in Employment Act

SECTION A

QUESTION 1

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

- (a) State the TWO circumstances in which employers do not have to provide personal protective equipment to their employees.

1 _____
2 _____

(1 mark)

- (b) An employee has had an accident resulting in serious harm.

- (i) Give FIVE different types of injury that are considered to be serious harm under the Act.

1 _____
2 _____
3 _____
4 _____
5 _____

(5 marks)

- (ii) State the number of days within which notification of a serious harm accident must be made and to whom the notification should be addressed.

(2 marks)

- (iii) State THREE circumstances in which it is permissible to interfere with the scene of a serious harm accident.

1 _____
2 _____
3 _____

(3 marks)

Total 11 marks

QUESTION 2

Working environments must be monitored to comply with the Health and Safety in Employment Act.

List THREE environmental conditions in the workplace that must be monitored.

- 1 _____
- 2 _____
- 3 _____

Total 3 marks

QUESTION 3

A pipe is to be installed through the roof of an industrial building while the roof is being installed. The roofing contractor has stated that a safety mesh or a safety net will be in place.

Describe each of these two options.

Safety Mesh _____

Safety Net _____

Total 3 marks

QUESTION 4

Machine-lifted work platform machines include elevating work platforms, cherry pickers, scissor hoists, crane lift platforms and building maintenance units.

State TWO factors that should be checked before using such a machine.

- 1 _____
- 2 _____

Total 2 marks

QUESTION 5

List SIX types of notifiable work.

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

Total 3 marks

QUESTION 6

Explain the difference between a fall arrest system and a fall prevention system.

- _____
- _____

Total 2 marks

QUESTION 7

Draw a sketch showing the flashing requirements when a 100 mm vent or flue penetrates the moisture barrier of an external wall of a dwelling. Include measurements in your answer.

Total 4 marks

QUESTION 8

Answer this question in relation to the requirements under the New Zealand Building Code Clause E2 External Moisture.

A corrugated iron roof has a pitch of 25° .

The maximum wind speed expected for the location is 50 metres per second.

A 100 mm vent pipe has been installed, penetrating 500 mm below the ridge of the roof.

Draw a diagram showing the flashing requirements for the installation.

Show all measurements.

Total 8 marks

QUESTION 9

A builder doing renovation work has requested that a metal pipe that passes through a wall be moved.

Give FOUR actions that must be carried out before the pipe is cut.

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

Total 4 marks

QUESTION 10

In addition to being used as a lining, plasterboard internal wall linings can have other purposes or features that they perform within a building structure.

(a) List four of these additional features or purposes

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

(2 marks)

(b) Explain two ways these specialised lining can be identified.

(2 marks)

Total 4 marks

QUESTION 11

- (a) The continuity and effectiveness of fire separations must be maintained around penetrations, and in gaps between or within building elements, by the use of fire stops.

There are many types of fire stops, each designed to suit specific situations.

Name THREE types or methods of fire proofing penetrations.

1 _____

2 _____

3 _____

(3 marks)

- (b) When different fire resistance ratings apply on each side of a fire separation penetration, state how the fire stop method is determined.

(2 marks)

Total 5 marks

QUESTION 12

Give TWO purposes for a wall cavity between a building frame and the external wall cladding.

1 _____

2 _____

Total 2 marks

QUESTION 13

Give the meaning of the term performance based standard or performance based code.

Total 1 mark

QUESTION 14

(a) Define the term alternative solution in relation to the New Zealand Building Code.

(2 marks)

(b) Explain the difference between an acceptable solution and an alternative solution.

(4 marks)

(c) Give the meaning of the term verification method.

(2 marks)

Total 8 marks

QUESTION 15

Name the TWO Acts of Parliament that relate to the supply of goods and services and provide protection for the purchasers of these goods and services.

1 _____

2 _____

Total 1 mark

QUESTION 16

(a) Explain the role of an Independently Qualified Person and state who controls the registration of an IQP.

(2 marks)

(b) List three different categories an Independently Qualified Person could become registered for.

1 _____

2 _____

3 _____

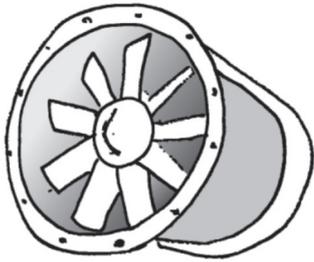
(3 marks)

Total 5 marks

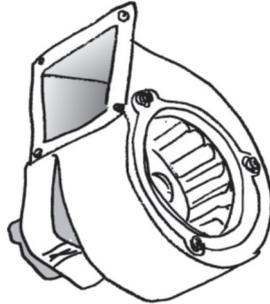
QUESTION 17

Identify the three fan types pictured.

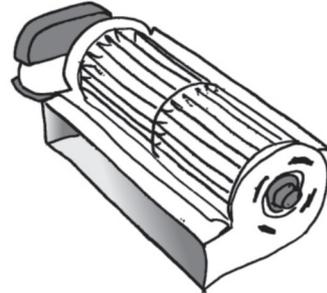
(a)



(b)



(c)



Total 3 marks

QUESTION 18

A theatre seats 250 people. The theatre is 10 m high, and has a floor area of 300 m². The theatre requires 28 m³ of fresh air per person per hour when it is in use.

A ventilation system for the theatre is to be designed.

Calculate the number of air changes per hour the ventilation system will need to be able to provide.

Total 3 marks

QUESTION 19

Define the following terms.

- (a) Humidity _____

- (b) Diversity Factor _____

- (c) Intrinsically safe _____

- (d) Proprietary system _____

- (e) Producer Statement _____

- (f) Specific Heat _____

Total 6 marks

QUESTION 20

A ducted warm air heating system is being installed.

State FOUR factors that should be considered when deciding the location for the thermostat.

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

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. Which statement best describes a plenum?

- A An instrument used for measurement of the wet bulb/dry bulb differential of an area in relation to relative humidity.
- B A manifold identification system for use when many differing substances are piped through the same space so as to easily identify each service.
- C A cowling designed to gather combustion products from an open air burner.
- D A sheet-metal or similar box in which air gathers before being distributed to outlets in an air movement system.
- E A metal grill which incorporates adjustable fins/vanes to direct airflow.

2. Which statement best describes a passive stack ventilator according to the New Zealand Building Code Clause G4.

- A A mechanical ventilation system where the fan is located remotely so as not to create annoyance to the occupants of the dwelling.
- B An open vent designed to allow stale air from a habitable space to ventilate to outside by use of the sanitary plumbing stack.
- C A system of ducts connecting to a common large diameter tube which traverses a habitable space, allowing air currents to flow easily from one end of the occupancy to the other.
- D A vertical ventilation shaft which uses air buoyancy to ventilate kitchens, bathrooms, toilets and laundries without an external wall.
- E A wind operated fan that is mandatory in workplaces that contain explosive gases.

3. An employer has been requested to organise an election for a health and safety representative by the employer's staff.

Within what time frame must the a election take place?

- A 1 week.
- B 2 weeks.
- C 1 months.
- D 2 months.
- E 6 months.

4. When an opening in foundation walls is being formed, any opening exceeding a specified measurement in any direction must be provided with a trimming bar on every side of the opening.

What is the specified minimum measurement according to NZS 3604 Timber Framed Buildings?

- A 300 mm.
- B 400 mm.
- C 450 mm.
- D 600 mm.
- E 700 mm.

5. Which statement best describes the method by which a ducted warm air heating system heats a building?

- A Radiant heat.
- B Radiant convection.
- C Convection.
- D Conduction.
- E Radiant conduction.

6. Which of the following best specifies absolute zero?

- A 273°K.
- B -273 K.
- C -101.3°C.
- D 0° K.
- E 0 K.

7. In relation to gases, which statement best gives standard reference conditions?

- A 9.81 meters per second.
- B Water will freeze at 0°C and boil at 100°C.
- C Atmospheric pressure 101.3 kPa at a temperature of 15°C at sea level.
- D Room temperature of 15°C wet bulb with relative humidity of 75%.
- E $V = p \div T$

8. Which statement best describes an inert gas?

- A Non-flammable.
- B Non-reactive.
- C Non-toxic.
- D Non-potable.
- E Non-aggressive.

9. A new piping material is to be installed on a job.

As well as being approved for use in New Zealand, the installation may need which of the following?

- A Internationally recognised approval assuring compliance with NZS 5261 or Clause G4 of the New Zealand Building Code.
- B The installer to be authorised/trained by the manufacturer.
- C Inspection by an Independently Qualified Person (IQP).
- D An additional producer statement from the installer affirming compliance of the material.
- E To be included on the compliance schedule.

10. According to the Health and Safety in Employment Act, who is responsible for issuing of hazard notices?

- A Employers.
- B Employees.
- C Territorial authority inspectors.
- D Trained health and safety representatives.
- E Building services engineers.

11. Which statement best gives the meaning of the term fire resistance rating?

- A The time for which a passive fire protection system can withstand a standard fire resistance test.
- B The heat that can be directly absorbed during a standard fire resistance test.
- C A material's inherent ability to withstand heat without catching fire.
- D The measurement of fire intensity that a material can be subjected to before weakening.
- E The temperature a product must reach to before it will ignite.

12. According to NZS 3604 which of the following gives the measurement of how close together notches in studs can be cut?

- A 200 mm.
- B 300 mm.
- C 400 mm.
- D 600 mm.
- E 650 mm.

13. When 1 litre of water is converted to steam, how much steam (approximately) does it produce?

- A 10 litres (0.010 m³).
- B 25 litres (0.025 m³).
- C 100 litres (0.1 m³).
- D 700 litres (0.7 m³).
- E 1700 litres (1.7 m³).

14. Which best describes the process of evaporative cooling?
- A A liquid is released into a heated tube evaporating into a cooler gas. The cooled gas is blown into a space cooling it.
 - B A compressor liquefies a gas and then releases it. This cool gas is circulated through fins and blown through circulating fans.
 - C A gas flame or electric element heats a water/ammonia mix, which separates, and when cooled, creates excess hydrogen. This, in turn, cools as it passes through a condenser and it allows cool air to be circulated by fans.
 - D A liquid uses latent heat from an object to change its state to a gas. Air is cooled as it passes over the cooled object.
 - E petroleum based liquids pass through a coil chilling it. Air is cooled as it is passed over the coil.

15. Which of the following is commonly referred to as the RMA in relation to the impact an installation will have on the environment?

- A The Regional Maintenance Agreement.
- B The Recommended Mode of Action.
- C The Recommended Means of Acceptance.
- D The Regional Management Act.
- E The Resource Management Act.

16. Where a notch or hole is cut into a timber top plate, the plate must be strengthened. Methods on strengthening the plate are described in NZS 3604 Timber Framed Buildings. Which measurement gives the maximum size notch or hole permitted before this is required?

- A 20 mm.
- B 25 mm.
- C 30 mm.
- D 32 mm.
- E 40 mm.

17. Which statement best describes legislation?
- A Acceptance of an application to the high court.
 - B The legal affirmation of a variation.
 - C A selection of parliamentary proposals.
 - D A law passed by parliament.
 - E A document which has be witnessed by a Justice of the Peace.

18. Which statement best describes a Compliance Schedule?
- A A document issued by a building consent authority.
 - B A document supplied by the designing architect.
 - C A document included when tendering for a contract.
 - D A document that gives the intended completion date for a building consent.
 - E A schedule of work ensuring parts of a contract are carried out in the correct order.

19. Which statement best describes a Certificate of Acceptance?
- A A document that is issued by the on-site building engineer for approval of building structure modifications.
 - B A document that is supplied by the designing architect.
 - C A document that is used in situations where work has been performed without a building consent.
 - D A document that is only used once a building consent has been finalised.
 - E A formal document given to the successful applicant after a contract has been tendered.

20. The New Zealand Building Act refers to insanitary buildings.
Which of the following situations falls into this category?
- A A building in which room temperatures can fall below 5°C.
 - B A building that has yet to be issued a certificate of compliance.
 - C A premises in which toxic chemicals are manufactured.
 - D Having a roof leak causing dampness in the building.
 - E A building that has no natural ventilation air ducts.

Total 20 marks

For Examiner's use only

Question number	Marks	Marks
1		
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