

L3D2



THE INSTITUTION OF FIRE ENGINEERS
Founded 1918 • Incorporated 1924

IFE Level 3 Diploma in Fire Science and Fire Safety

Unit 2: Fire Safety (F/505/6006)

Thursday 8 March 2018

10.30 – 13.30

Instructions to Candidates

1. The time allowed for this examination is **THREE** hours.
2. Candidates must answer **SIX** questions from the total of **EIGHT** questions set for this examination.
3. All questions carry equal marks and may be answered in any order. Candidates should follow the instructions provided in the question when composing their answers.
4. Candidates should record all of their answers in the answer book provided.
5. The question paper must be handed in with the answer book.

Question 1

- a) With regards to passive fire protection, explain what a cavity barrier is. (4 marks)
- b) Describe two different situations where a cavity barrier would be installed explaining why and where it would be fitted. (6 marks)
- c) State three types of openings which would be allowed within a cavity barrier. (3 marks)
- d) Describe what is meant by fire stopping. (3 marks)
- e) Describe the two main situations where fire stopping should be provided. (4 marks)
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Question 2

- a) Explain the term sacrificial timber. (2 marks)
- b) Explain how timber protects itself in a fire. (2 marks)
- c) Describe four advantages of using timber rather than other unprotected, non-combustible materials. (8 marks)
- d) Describe two different ways of flame retarding timber. (2 marks)
- e) Describe the two main ways in which concrete is reinforced with steel. (6 marks)
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Question 3

a) There are many different designs of sprinkler head, but they may be generally divided into two categories based on their operating methods. Explain and describe both.

(10 marks)

b) Explain the operation and design of a pendant sprinkler head and state where this type of sprinkler head may be used.

(5 marks)

c) Explain the design and use of a sidewall sprinkler head.

(5 marks)

Question 4

a) State the two main functions of a fire door.

(2 marks)

b) Explain the purpose, operation and fitting of intumescent strips on a fire door assembly.

(7 marks)

c) State six features of a fire door other than intumescent strips.

(6 marks)

d) State five locations where a fire door would typically be required in a building.

(5 marks)

[Please turn over]

Question 5

- a) Travel distances for escape are usually described in four distinct stages. State the stages. (4 marks)
- b) In terms of fire exit routes, explain what is meant by the term “place of relative Safety” and give two examples of such places. (4 marks)
- c) Describe four measures that can be taken to reduce the hazards and risks of dead ends for individuals that have to escape in one direction from a dead end. (4 marks)
- d) State eight areas of a building that would normally be covered by emergency escape lighting. (8 marks)
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Question 6

You have been tasked with carrying out a fire risk assessment in a residential care home which has 4 floors and has 20 occupants. The majority of the occupants are not able to respond to a fire alarm without assistance.

- a) Outline the fire safety arrangements you would expect to find in this care home. You should detail the active and passive fire systems which would be appropriate as well as management controls and a suitable evacuation strategy. (12 marks)
- b) During the inspection you find that medical gas cylinders are being used on site. Outline suitable storage and usage arrangements for these gases. (8 marks)
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Question 7

- a) Describe the benefits of using lifts to evacuate people from a building in an emergency. (6 marks)
- b) Describe the facilities and features that you would expect to find in the design of an evacuation lift. (6 marks)
- c) The length of time occupants will wait for a lift during an evacuation will depend on a number of factors. Describe the factors that will influence their decision. (8 marks)
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Question 8

- a) Identify the two classes of smoke detectors commonly used in domestic premises and briefly describe how each one operates (including the type of smoke particle that each is best able to detect). State where each would be best positioned in a domestic setting. (10 marks)
- b) Heat detectors operate in two distinct ways. Explain the two operating methods and state (with explanation) the type of heat detector that you would recommend for fitting in a kitchen. (4 marks)
- c) Explain the term “thermal lag” in relation to heat detectors. (2 marks)
- d) Explain how a Carbon Monoxide fire detector works and give two reasons why Carbon Monoxide fire detectors are rarely recommended for domestic use. (4 marks)
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