

IFE Level 3 Diploma in Fire Safety and Fire Science

Unit 2 – Fire Safety (Zone 1)

Examiner Report – March 2018

Introduction

42% of candidates attained a Pass. Half of the candidates that attained a Pass secured either a Grade C or a Grade B.

Candidates performed best on question 5 but performance on questions 2 and 8 was also good. Candidates performed least well on question 1.

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)*

Examiner Feedback

This question was the least popular option for candidates. Unfortunately, those candidates that attempted the question generally performed poorly.

Few candidates appeared to understand that a cavity barrier is a construction, other than a smoke curtain, provided to close a concealed space against penetration of smoke/flame or provided to restrict the movement of smoke and flame within such a space. Candidates who described a cavity often failed to understand how a cavity barrier works.

A similar situation arose in relation to fire stopping. Many candidates omitted parts d) and e). Candidates should be aware that fire stopping takes the form of seals provided to close an imperfection of fit or design tolerance between elements or components to restrict the passage of fire and smoke.

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)*

Examiner Feedback

This was a popular question and was often answered well. Part e), in particular, was often answered very well with many candidates attaining all, or a high proportion, of the marks available for this part of the question. Candidates often performed less well on the other parts of the question and it was common for candidates attempting question 2 to attain all (or most) of their marks for this question from their response to part e).

A surprising number of candidates were unaware that the two ways of flame retarding timber are surface coatings (painted onto the timber surface with little or no penetration into the wood) and impregnation.

Few candidates were able to explain how timber protects itself in a fire. Candidates should be aware that the build-up of carbon on the surface (in the form of charred wood) limits the oxygen supply to the underlying wood and acts as an insulator so the wood below the charred level is relatively cool and retains its structural integrity.

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)*

Examiner Feedback

Part a) was often answered well with most candidates identifying the two types of sprinkler head correctly ie fusible link and glass bulb sprinkler heads. Candidates often provided several relevant points in their descriptions.

Parts b) and c) were less well answered. Candidates generally recognised that pendant sprinklers hang down from the ceiling and sidewall sprinklers protrude through the wall. However, few were able to add additional information in relation to the way that water is sprayed; the fact that a sidewall sprinkler has only half of a deflector which sprays water in a half circle or crescent shape did not appear to be understood. Candidates often omitted to state where a pendant sprinkler head might be used.

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)

Examiner Feedback

The purpose of a fire door was well understood and candidates were also able to state locations where a fire door would be required.

However, candidates appeared to have less understanding of the technical detail of the construction of fire doors. Candidates often performed poorly on part b) as they were unable to explain the operation and fitting of an intumescent strip.

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)*

Examiner Feedback

This question was often answered well.

Most candidates were able to provide the stages in response to part a) and secured all four of the marks available.

Part b) was less well answered as many candidates sometimes confused a place of relative safety with a place of ultimate safety or presented responses that lacked the precision required. Candidates should be aware that in terms of an exit route, a place of relative safety includes any place that puts an effective barrier (normally 30 minutes' fire resistance) between the person escaping and the fire. Although most candidates cited a disabled refuge as an example of such a place, few were able to provide the second example required; additional examples that could have been provided included a storey exit into a protected stairway or a final exit via a protected corridor.

Part c) was often answered poorly with candidates omitting to consider obvious measures such as fire detection and alarm systems, systems to ensure the area is kept free of obstructions and ensuring that nobody has to pass through a high risk area.

Part d) was usually answered well with many candidates able to secure all, or most, of the marks available.

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)*

Examiner Feedback

Most candidates were able to achieve at least some of the marks available for part a) with relevant arrangements such as fire alarm systems, importance of having sufficient staff on duty to support evacuation, compartmentation, emergency lighting system, self-closing fire doors to bedrooms, staff training etc being correctly cited.

Part b) was less well answered. Few candidates showed understanding of the basic precautions needed. The question did not ask about dealing with a fire involving cylinders but many candidates focussed on firefighting arrangements in this context. Examples of the sort of points that could have been made include:

- cylinders should be stored outside in a safe and secure location.
- cylinders needed indoors should be kept in a well ventilated area.
- cylinders should not be stored in escape routes, staircases or by emergency exits.
- storage should be away from extremes of heat and naked lights.
- cylinders should be clearly marked with warning signs.

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)*

Examiner Feedback

This question was a popular choice for candidates but few candidates demonstrated the in-depth technical understanding required to attain high marks. In response to part a), most candidates identified speed but few explored benefits more widely to consider issues such as the fact that this may be the only option for some people with disabilities, the fact that some people may be more familiar with this option or the fact that some people using the lift reduces congestion on the stairs.

In response to part b), many candidates appeared to be taking guesses. Most people correctly identified communication facilities but few explored the issues related to protected shafts, provision of lift lobbies or alternative or protected power supplies.

Part c) of the paper focused on human behaviour. Most candidates identified one or two points but the lack of depth in responses limited the marks that could be attained.

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)*

Examiner Feedback

Part a) was generally answered well. Most candidates gained most of their marks for this question for their response to part a).

There were some good responses to part b) but many candidates provided insufficient technical information to attain all of the marks available.

The term “thermal” lag was poorly understood with few candidates providing correct responses. Candidates should be aware that thermal lag occurs when rapid temperature increases cause the heat detector to alarm at a temperature higher than its set point.

Carbon monoxide fire detectors were poorly understood and few candidates provided detailed responses to this part of the question.