

# IFE Level 2 Certificate in Passive Fire Protection

## Examiner Report – March 2019

### Introduction

This was the first time that this examination was offered. 38 candidates entered for the examination. 61% of the candidates that sat the examination achieved a Pass.

Candidates should be aware that the mark allocation shown next to the questions indicates the number of points required in answers as one mark is awarded for each valid point presented. Candidates sometimes presented only brief responses (or single statements) where there were several marks available.

### Section 1

Candidates generally performed well on this part of the paper and 60% of the candidates secured at least half of the marks available.

#### Question 1

*Describe from a scientific perspective, the following two stages of fire development:*

- a) *Ignition (2 marks)*
- b) *Decay (3 marks)*

#### **Examiner Feedback**

This was the least well answered question in this section of the paper. Candidates were required to demonstrate understanding from a scientific perspective but few candidates provided specific detail. In relation to ignition, marks were available for identifying that heat, oxygen and a fuel source are required and that these elements combine to achieve a chemical reaction resulting in fire. In relation to decay, marks were available for identifying points such as: this is likely to be longest stage of a fire, it is influenced by decrease in oxygen or fuel and/or the actions of fire service/extinguishing process and there is a risk that fire may re-occur if oxygen reintroduced/other combustibles ignite.

#### Question 2

*State four factors that affect the length of time it takes a person to react to a fire alarm. (4 marks)*

#### **Examiner Feedback**

This question was often answered well with most candidates able to identify four relevant factors. Examples of points that would have secured marks include:

- Regularity of the alarm being heard (eg history of false alarms/tests)
- Physical state eg sleeping, under the influence of alcohol, medication, drugs
- Whether able bodied or physically impaired
- What they are doing at the time and whether they want to finish eg work task/meal
- Whether senses recognise danger (eg smell, sight, hearing)
- Actions of others (ie herd instinct/whether others react or not)

### **Question 3**

*Explain what is meant by passive fire protection and give two examples of different passive fire protection systems that can be found in buildings. (3 marks)*

#### **Examiner Feedback**

Some candidates were unable to explain that passive fire protection is protection that is built into the fabric of the building and does not need to be activated. Candidates that did not understand the nature of passive fire protection were not able to provide appropriate examples.

### **Question 4**

*One of the factors that affects the fire resistance of a building is integrity. Identify and describe two other factors. (4 marks)*

#### **Examiner Feedback**

Candidates were usually able to identify at least one of the factors (ie stability/loadbearing and insulation). Marks were available for naming each of the factors. However, candidates often failed to describe the factors or to provide a correct description and, as a result, missed the opportunity to attain the additional marks available.

### **Question 5**

*Identify two different passive fire protection measures that may rely on smoke detection or fire alarm systems and describe the basic principle of operation of each. (4 marks)*

#### **Examiner Feedback**

Some candidates did not recognise that the types of measures that were required were measures such as door closers, fire dampers, smoke control ducts and dampers and active fire barriers.

## **Section 2 – Option 1: Fire Protection to the Structural Frame of the Building.**

Only a third of the candidates that sat this paper chose to answer questions from Option 1. Only a third of these candidates attained 15 or more of the 30 marks available. The average mark attained for this option was 10.

### **Question 1.1**

*Concrete framed buildings are usually designed in a way that does not require the addition of passive fire protection systems.*

- a) Explain when additional fire protection may need to be applied. (2 marks)*
- b) Describe two methods by which this may be achieved. (2 marks)*
- c) Explain two factors that govern the performance of structural concrete in buildings. (2 marks)*

### **Examiner Feedback**

Few candidates demonstrated detailed understanding of the context of concrete. Candidates were most likely to secure marks for their response to part c).

In relation to part a), the situations that could have presented in answers were:

- Change of use of a building
- Refurbishment that would come under the scope of building regulations approval
- Increased fire load introduced

### **Question 1.2**

*Describe two options available to ensure the fire resistance of timber. (4 marks)*

### **Examiner Feedback**

Candidates were usually able to identify the options and secured marks for naming them. However, some candidates did not provide the additional descriptions required and/or made errors in their responses and therefore were not able to capitalise on the marks available.

### **Question 1.3**

*Describe how steel is affected by heat in a building fire and state the factors that affect the fire resistance of a steel frame. (5 marks)*

### **Examiner Feedback**

Candidates often answered only part of the question with some writing only about the way in which steel is affected by heat and others stating only the factors affecting fire resistance.

#### **Question 1.4**

- a) *With respect to structural steel protection, state the purpose of cladding systems made from fire-resisting boards or stone wool products and state where they may be used. (3 marks)*
- b) *State three different types of materials that are used in the manufacture of these boards. (3 marks)*

#### **Examiner Feedback**

This question was often answered well and candidates were able to secure high marks for their responses.

#### **Question 1.5**

*In relation to materials used to enhance the structural resistance of steel, describe each of the following methods of application:*

- a) *profile (2 marks)*
- b) *solid (2 marks)*

#### **Examiner Feedback**

This question was usually answered well.

#### **Question 1.6**

- a) *Explain why minor damage to intumescent coating systems should be repaired at the earliest opportunity. (2 marks)*
- b) *State the process to follow when repairing damage to intumescent coating systems. (3 marks)*

#### **Examiner Feedback**

In response to part a), some candidates were unable to explain that damage should be repaired as soon as possible to avoid moisture ingress which would lead to degradation of the intumescent.

When responding to part b), candidates often stated relevant steps but some omitted to recognise that the same material as the primary installation should be used to match to approved thickness.

## Section 2 – Option 2: Fire Resisting Walls, Floors and Ceilings

This was the least popular option for candidates with only seven candidates choosing to answer the questions in this optional area. Only three of the candidates attained 15 or more marks.

### **Question 2.1**

*Two different types of fire-resistant floors are timber joist floors and concrete floors. For each of these two types of floors explain how they may be affected by fire and describe the fire protection methods that can be applied to enhance fire resistance. (8 marks)*

#### **Examiner Feedback**

Most candidates were able to identify at least one relevant point in relation to the two types of floor. However, many candidates failed to appreciate that there were eight marks available for this question and therefore, in order to achieve eight marks, eight relevant points were required. The lack of detail in the responses limited the marks that could be attained.

### **Question 2.2**

*State four different types of boards that may be used in partitioning systems designed to enhance the fire resistance of compartment walls. (4 marks)*

#### **Examiner Feedback**

This question was often answered well with most candidates able to list one or more types of board.

### **Question 2.3**

- a) Describe the way that active fire curtain barriers operate. (3 marks)*
- b) State three different types of active fire curtain barriers. (3 marks)*

#### **Examiner Feedback**

Again, the main issue in responses was that candidates did not provide sufficient detail in their responses. In response to part a), some candidates appeared to guess or provided only a brief comment about barriers operating when fire was detected. To score three marks, three points were required such as: fire resistant fabric curtain, which is deployed on activation of the fire alarm to provide fire resisting construction, normally provided by a wall, floor or door.

Few candidates could state the different types. Marks were available for identifying each of the following: Vertical active fire curtain barriers, Horizontal active fire curtain barriers, Folded/Pleated active fire curtain barriers.

### **Question 2.4**

*Explain the purpose of fire resisting ceilings. (2 marks)*

#### **Examiner Feedback**

Most candidates identified that fire resisting ceilings protect a structure above, such as a timber floor or structural steelwork. Few referenced that they separate building services from the space below.

### **Question 2.5**

*Describe each of the following types of glazing and state how each behaves in fire:*

- a) wired glass. (3 marks)*
- b) laminated composites. (3 marks)*

#### **Examiner Feedback**

This question was often answered poorly with few candidates able to describe the types of glazing and therefore unable to explain how it behaved in fire.

Candidates should be aware that wired glass is formulated with a grid or mesh of thin metal, wire embedded within the glass in the manufacturing process; laminated composites are formed with a sodium silicate-based interlayer.

### **Question 2.6**

*Identify four factors to be considered when glass is supported by a timber framing. (4 marks)*

#### **Examiner Feedback**

This question was usually answered well and most candidates attained at least some of the marks available.

## Section 2 – Option 3: Fire Stopping and Penetration Seals, Cavity Barriers, Ductwork and Dampers and The Building Envelope

This was the most popular option for candidates and 81% of the candidates who attempted the questions secured 15 marks or above. The average mark per candidate was 17. One candidate attained 26 of the 30 marks available.

### **Question 3.1**

*Describe, with the use of an example, the situations where the following fire-stopping products and services would be used:*

- a) penetration seals. (2 marks)*
- b) small cavity barriers. (2 marks)*
- c) open state cavity barriers. (2 marks)*

### **Examiner Feedback**

Some candidates were unable to provide correct information on each of the different products. Sometimes candidates omitted to include an example of the usage and this meant they were able to attain only half of the marks. For example, to secure both of the marks in relation to small cavity barriers, candidates needed to state that small cavity barriers are used at imperfections in the building process and then provide an example such as at the junctions of walls/floors with cladding/curtain walling or between separating walls and a roof or over and between leaves of masonry walls.

### **Question 3.2**

*Describe two fire stopping/sealing systems that could be used in relation to cable penetration. (2 marks)*

### **Examiner Feedback**

This question was usually answered well and most candidates secured both of the marks available.

### **Question 3.3**

- a) Explain the purpose of pipe closures. (3 marks)*
- b) State two different methods of pipe closures. (2 marks)*
- c) Describe how pipe closure systems work. (3 marks)*

### **Examiner Feedback**

Most candidates secured at least some of the marks available for this question. Some candidates were able to explain the purpose of pipe closures but were unable to identify different methods of pipe closures or detail the way in which the systems work.

### **Question 3.4**

*Describe the use of ductwork. (2 marks)*

#### **Examiner Feedback**

This question was usually answered well and most candidates secured both of the marks available.

### **Question 3.5**

*a) Describe the operation of a curtain fire damper. (4 marks)*

*b) State two other types of dampers. (2 marks)*

#### **Examiner Feedback**

Part a) required candidates to identify four points relevant to the operation of a curtain fire damper. Few candidates provided four points in their response. Examples of points that would have secured marks include the following:

- Folding curtain fire dampers are constructed of a series of interlocking blades
- Which fold to the top of the assembly permitting the maximum free area in the airway
- The blades are held open by means of a thermal release mechanism or fusible link which is set to a specific temperature/normally rated at 72°C +/- 4°C
- When the set temperature is reached, the blades fall/are sprung to fill the airway and prevent the passage of the fire hot smoke and combustion gasses.

Part b) was generally answered well with most candidates able to secure both of the marks available.

### **Question 3.6**

*a) State three purposes of cladding. (3 marks)*

*b) Explain how cladding can affect external fire spread. (3 marks)*

#### **Examiner Feedback**

Most candidates were able to state three purposes of cladding in response to part a). Few candidates provided sufficient detail in their response to part b) to secure all three of the marks available. Points that could have been made include:

- Many systems, for example rain screen claddings, are retrofitted to existing buildings to provide for weather protection and increased thermal efficiency so are not designed as part of fire protection
- The space between the cladding and the existing façade can be a route for fire to propagate around the building.
- Adequate, appropriately fire-tested fire stopping should be provided
- Poor fitting
- Flammable materials, in particular insulation materials, can increase fire load and the ease with which fire can spread

## Section 2 – Option 4: Fire Resisting Doors, Industrial Shutters and associated Hardware

This option was a popular choice for candidates with over half of the candidates choosing the option. However, only a third of the candidates that chose this option scored more than half of the marks available.

### **Question 4.1**

*Describe the purpose of fire doors. (4 marks)*

#### **Examiner Feedback**

Few candidates identified four different points although most achieved at least two marks for the response to this question. Points which could have been made included:

- Act as a barrier to fire, cutting off and protecting parts of a building
- Maintain fire compartmentation
- Reduce damage caused by fire and smoke
- Protect route of evacuation
- Provide the emergency services with a protected route to access the building
- Protect users of the building who may have difficulty evacuating quickly

### **Question 4.2**

*State three locations in a public building where fire doors should be fitted. (3 marks)*

#### **Examiner Feedback**

This question was often answered well with most candidates able to provide at least one correct location.

### **Question 4.3**

*Describe each of the following:*

- a) *fire doorset (4 marks)*
- b) *fire door assembly (4 marks)*

#### **Examiner Feedback**

There were eight marks available for this question. Candidates were required to provide four detailed points in response to both part a) and part b). However, answers were often brief and candidates failed to demonstrate sufficient understanding to secure more than a few marks.

#### **Question 4.4**

- a) *Describe the purpose of intumescent seals. (1 mark)*
- b) *Describe the factors to be considered when fitting intumescent seals and describe how they operate in case of fire. (5 marks)*

#### **Examiner Feedback**

Some candidates did not provide an appropriate description of the purpose of intumescent seals. Candidates sometimes misread part b) and provided only factors to be considered or only a description of the operation of the seals in fire.

#### **Question 4.5**

*Explain the factors to be taken into account when fitting hinges to a fire door. (3 marks)*

#### **Examiner Feedback**

This question was often answered well.

#### **Question 4.6**

*State the checks that would be completed when carrying out a maintenance inspection in relation to:*

- a) *door leaf and frame of a fire door. (3 marks)*
- b) *locks and lever handles. (3 marks)*

#### **Examiner Feedback**

Candidates often provided good responses to part a) with most able to identify key issues around fit and damage. Candidates often failed to provide three appropriate points in response to part b). Checks which could have been referenced in responses and which would have secured marks included:

- Lock levers fully return to the horizontal after use
- Latch bolt is engaged smoothly and completely into the keep
- Wipe any metal dust deposits off the latch bolt and adjust, lubricate or replace as per manufacturers recommendation
- Fixings - correct number and appropriate type and size

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