

# IFE Level 2 Certificate in Passive Fire Protection

## Examiner Report – October 2019

### Introduction

This was the second time that this examination was offered. 63% of the candidates that sat the examination achieved a Pass; this was a slight improvement on the pass rate in March 2019 where 61% of candidates achieved a Pass.

### Section 1 – Fire and Fire Protection

Candidates generally performed well on this section of the paper. There were 20 marks available and the average mark achieved was 13. The highest mark achieved was 18.

#### Question 1

*State the five stages of fire development. (5 marks)*

#### **Examiner Feedback**

This question was generally answered well with most of the candidates able to provide the five stages of fire development ie: ignition (insipient), growth, flashover, fully developed and decay.

#### Question 2

*State four factors that affect how quickly people move when they hear a fire alarm. (4 marks)*

#### **Examiner Feedback**

Most candidates achieved a high proportion of the marks available for this question. Some candidates repeated points by providing variations on the same factor. Marks were available for factors such as:

- knowledge of building layout
- regularity of the alarm being tested and history of false alarms/tests
- fire drill discipline and subsequent good awareness of steps to be taken
- physical state eg sleeping, under the influence of alcohol, medication, drugs
- whether able-bodied or physically impaired
- actions of others (ie herd instinct)
- clarity of fire exit signage
- panic

### Question 3

*Describe the purpose of passive fire protection. (3 marks)*

#### **Examiner Feedback**

This question was usually answered well with most candidates securing all of the marks available. Some candidates provided imprecise descriptions and omitted key elements such as the fact that measures should remain effective for a prescribed length of time.

### Question 4

*In relation to the principles of means of escape in case of fire, explain what is meant by:*

*a) place of reasonable safety (2 marks)*

*b) place of total safety (2 marks)*

#### **Examiner Feedback**

Some candidates were unable to define the terms sufficiently precisely to secure full marks. As with responses to question 3, it was common to miss out key elements of the definition eg reference to an effective barrier of fire resistance when explaining the term *place of reasonable safety*. Candidates should be aware that:

- a place of reasonable or relative safety is a place of comparative safety including any place that puts an effective barrier (normally 30 minutes) fire resistance between the person escaping and the fire
- a place of total or ultimate safety should be in the open air from where people can disperse away from the building

### Question 5

*Give one example of a smoke detection system and one example of a heat detection system. (2 marks)*

#### **Examiner Feedback**

Many candidates were unable to provide the examples required and therefore failed to attain any of the marks available.

Examples of smoke detection systems include ionisation smoke detectors, optical smoke detectors, aspirating smoke detectors and optical beam detectors.

Examples of heat detection systems include fixed temperature heat detectors, rate-of-rise detectors, electronic sounders and visual indicators.

### Question 6

*State two types of sprinkler systems that may be available within a building. (2 marks)*

## **Examiner Feedback**

Those candidates who attempted this question usually referenced the wet and dry types of sprinkler systems. Other types of sprinkler system include alternate, pre-action and recycling. Some candidates referenced other types of water suppression systems such as water mist and drenchers; these systems are not sprinkler systems so did not secure marks.

## **Option 1 - Fire Protection to the Structural Frame of the Building**

There were 30 marks available for this option. This was not a popular option for candidates but candidates that attempted this option often attained high marks. The average mark attained was 13 but some candidates scored well above half marks with the highest marks attained being 22.

### Question 1.1

*Identify three factors that affect the fire resistance of concrete frames. (3 marks)*

## **Examiner Feedback**

This question was usually answered well with many candidates securing all of the marks available.

### Question 1.2

*Describe what is meant by 'sacrificial timber' and explain how this improves the stability of timber in fire. (4 marks)*

## **Examiner Feedback**

Few candidates attained all four marks as candidates often provided only basic information about sacrificial timber and did not go on to explain how this improves the stability of timber in fire. The omission of the additional information that was required by the question meant that candidates were unable to attain the additional marks available.

### Question 1.3

*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) *Box (2 marks)*
- c) *Solid (2 marks)*

### **Examiner Feedback**

The methods of application were well understood and most candidates attained a high proportion of the marks available.

#### Question 1.4

*Describe three different types of fire protection boards. (6 marks)*

### **Examiner Feedback**

This question was rarely answered well. Many candidates were unable to provide three appropriate examples and those that did provide examples often omitted to provide the description required by the question. There were many different types of board that could have been covered. Examples of types that could have been included follow:

- plasterboard - paper faced core of gypsum which may contain glass fibre and/ or other additives in the core
- glass reinforced gypsum - gypsum either faced with glass tissue or reinforced with glass fibre
- fibre reinforced gypsum - gypsum reinforced with cellulose fibre or synthetic fibre or mixture of these
- fibre reinforced calcium silicate - autoclaved calcium silicate reinforced with cellulose fibre or synthetic fibre or mixture of these and other additives
- fibre reinforced cement - air cured ordinary portland cement or other inorganic cement reinforced with cellulose fibre or synthetic fibre or mixture of these and other additives
- organic cement bonded lightweight filler - vermiculite, perlite or other lightweight filler bonded with organic resin

#### Question 1.5

*Explain how steel behaves in fire and the way that this affects the fire protection required. (4 marks)*

### **Examiner Feedback**

Most candidates secured at least some marks for their response to this question. Candidates sometimes provided brief responses without going into sufficient detail to secure all of the marks available. Candidates should be aware that marks are awarded to relevant points and therefore a question with four marks available required four points.

#### Question 1.6

- a) Describe how thick reactive (intumescent) paint coatings on steel sections perform in fire conditions. (3 marks)*
- b) Describe four checks that would be carried out when applying intumescent paint on a steel section. (4 marks)*

## **Examiner Feedback**

Part a) was usually answered well with candidates often able to secure all of the marks available. Part b) was less well answered and sometimes omitted completely. Examples of points that would have secured marks follow:

- ensure that surface preparation is as specified by manufacturer
- ensure that surface is free of dust or other contamination
- ensure that air temperature, substrate temperature, relative humidity and dew point (throughout the application process) are as specified or as manufacturer's data sheet.
- check batch numbers of all products used
- carry out wet film thickness checks
- complete dry film thickness survey and records: (i) at primer stage (ii) after application of intumescent basecoat and (iii) on completion of coating; thicknesses at each stage should be in accordance with the specification.  
check visual appearance is as specified or in accordance with agreed standard.

## **Option 2: Fire Resisting Walls, Floors and Ceilings and Fire-Resistant Glazing**

There were 30 marks available for this option. Over half of the candidates attempted this option. The average mark attained was 13 but some candidates attained over half marks with the highest mark awarded for this section being 23.

### Question 2.1

*Explain the purpose of a compartment wall. (3 marks)*

## **Examiner Feedback**

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

### Question 2.2

*Explain how timber joist floors may be affected by fire and describe the fire protection methods that can be applied to enhance fire resistance. (4 marks)*

## **Examiner Feedback**

Most candidates referenced sacrificial timber and the thickness of the timber and secured marks for these points. However, few candidates went into detail in relation to protection to the underside and the fact that underside protection will normally be provided by fire resistant board systems such as plasterboard or similar.

### Question 2.3

*Describe how concrete floors perform in a fire. (4 marks)*

#### **Examiner Feedback**

This question was usually answered well with candidates understanding the issues related to trapped moisture and subsequent spalling. Marks were also available for describing the effect of any steel reinforcement ie any steel reinforcement in the concrete will be initially protected by the concrete until spalling exposes the steel and it will then substantially expand to threaten the viability of use as a floor.

### Question 2.4

*a) Describe the purpose and operation of active fire curtain barriers. (3 marks)*

*b) Identify three types of fire curtain barriers. (3 marks)*

#### **Examiner Feedback**

Part a) was often answered well but some candidates failed to identify three types of fire curtain barriers when responding to part b). Candidates should be aware that the three types of fire curtain barriers are: vertical active fire curtain barriers, horizontal active fire curtain barriers and folded/pleated fire curtain barriers

### Question 2.5

*Describe three factors affecting the degree of fire resistance required. (3 marks)*

#### **Examiner Feedback**

Some candidates failed to secure marks for their response to this question. Points which could have been provided included:

- the specified fire resistance period
- height of the top floor above ground and the intended use of the building
- whether fire resistance is expected from one side or both sides of the barrier
- the type of fire performance required ie stability, integrity and insulation
- purpose or user group
- fireload

### Question 2.6

*Identify and describe three different types of 'integrity rated glazing'. (6 marks)*

### **Examiner Feedback**

Some candidates were unable to identify three different types of integrity rated glazing. Those candidates that did identify one or more different types often omitted to provide the required description and therefore were able to attain only half of the marks available.

#### Question 2.7

*The way that a glazing system is supported is critical to its performance in fire.*

- a) Describe the purpose and use of glazing seals. (2 marks)*
- b) Describe the purpose and use of glazing beads. (2 marks)*

### **Examiner Feedback**

Candidates often provided good responses to this question and were able to secure at least half of the marks available.

## **Option 3: Fire Stopping and Penetration Seals, Cavity Barriers, Ductwork and Dampers and the Building Envelope**

This option was the most popular option for candidates with 75% of the candidates who took the examination choosing to answer the questions in this section of the paper. The average mark achieved for this option was 14 and the highest mark secured was 21.

#### Question 3.1

*Explain the purpose of fire stopping. (2 marks)*

### **Examiner Feedback**

This question was usually answered well with many candidates securing both of the marks available.

#### Question 3.2

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

- a) linear joint seals (2 marks)*
- b) small cavity barriers (2 marks)*
- c) open state cavity barriers (2 marks)*

### **Examiner Feedback**

Although some candidates answered this question well, other confused the different types of barriers. Some candidates either failed to provide the examples required by the question or

else provided inappropriate examples and consequently failed to achieve the marks available for provision of relevant examples.

### Question 3.3

*One method of fire stopping is bags/pillows. Describe the circumstances when this would be an appropriate option and state why this is the case. (4 marks)*

#### **Examiner Feedback**

This type of fire stopping was well understood and many candidates secured all four of the marks available.

### Question 3.4

*Describe fire barriers and state where they are used. (4 marks)*

#### **Examiner Feedback**

The use of fire barriers did not appear to be well understood and some candidates failed to secure marks for their response to this question. Candidates should be aware that:

- Fire barriers are large curtain type barriers which are usually constructed from either non-combustible fabric such as glass or ceramic cloths or are fabricated from stone wool curtains incorporating a reinforcing mesh. They must maintain the integrity and insulation rating of the wall that they are continuing.
- Fire barriers can be used as large cavity barriers. However, they are typically used to continue the compartment line of a fire resisting wall up to a roof or to the underside of a compartment floor. They are used to seal large openings, which commonly occur within roof spaces or ceiling voids.

### Question 3.5

*Describe three methods of maintaining the fire resistance of walls and floors penetrated by ventilation ducts. (6 marks)*

#### **Examiner Feedback**

This question was often omitted and those candidates that did answer the question usually scored only low marks. In order to secure marks, candidates needed to identify and briefly describe any three of the following methods:

- protection using thermally actuated fire dampers
- protection using fire resisting enclosures
- protection using fire resisting ductwork
- protection using automatically actuated fire and smoke dampers triggered by smoke detectors

### Question 3.6

- a) *Describe the operation of an intumescent fire damper. (3 marks)*  
b) *Name two other types of dampers. (2 marks)*

#### **Examiner Feedback**

This question was usually answered well and many candidates were able to secure full marks for their response. Nearly all candidates who attempted the question were able to identify two types of damper in response to part b) but some candidates failed to provide sufficient correct detail on the operation of an intumescent fire damper to secure all of the marks available for part a).

### Question 3.7

*In relation to the construction and design of the building envelope, describe how cladding can affect the fire resistance of a building. (3 marks)*

#### **Examiner Feedback**

This subject area appeared to be well understood and many candidates were able to secure full marks for their response.

## **Option 4: Fire Resisting Doors, Industrial Shutters and Associated Hardware**

This option was the least popular option for candidates with a less than one quarter of the candidates tackling these questions. Performance was varied with some candidates appearing to have very limited knowledge and scoring very low marks but with others attaining marks in the twenties – the highest score for this section of the paper was 27. The average mark attained for this option was 11.

### Question 4.1

*State four locations in a building where fire doors should be fitted. (4 marks)*

#### **Examiner Feedback**

Some candidates were unable to identify four appropriate locations. Examples of points which could have secured marks include:

- in a cavity barrier (wall) where applicable
- above two levels, every door leading to the stairwell (at all levels).

- where the door leads to a habitable room. (i.e. not a bathroom or w/c)
- when a property has a loft conversion
- between house and integral garage
- between the business and residential elements in a mixed-use building
- front door of individual flats
- within individual flats to stop the spread of fire between room
- specific hazard areas

#### Question 4.2

*In relation to the materials used in the construction of fire resisting door leaves, identify two different types of door leaf construction and describe the features of each type. (6 marks)*

#### **Examiner Feedback**

Some candidates appeared to be familiar with only one type of door leaf construction, usually timber and this meant that they were able to access only half of the marks available. Other than timber, candidates could have identified and described steel and composite.

#### Question 4.3

*Describe the purpose and construction of fire resisting roller shutters. (4 marks)*

#### **Examiner Feedback**

Some candidates appeared to be unfamiliar with fire-resisting roller shutters and either omitted the question completely or else appeared to guess at the response. Examples of information that could have been included in responses include:

- they form protection to an opening in a fire-resisting wall or floor or in a structure surrounding a protected shaft
- historically, fire shutters have been manufactured from steel but reinforced glass fibre matting is also available
- all fire shutters should be fitted with an automatic 'self-closing device' or held open by A local heat detection release mechanism such as a fusible link or an automatic release mechanism operated from remote smoke detection equipment or an alarm system

#### Question 4.4

*Identify three ironmongery items found on a typical fire-resistant door and for each item state one consideration in relation to maintaining fire resistance. (6 marks)*

### **Examiner Feedback**

Candidates usually identified three ironmonger items and scored the marks for identification. However, some candidates failed to provide an adequate/correct description and therefore were unable to attend the marks available for description.

### Question 4.5

*Identify and explain the purpose of two pieces of information (signage) that should be displayed on fire doors. (4 marks)*

### **Examiner Feedback**

Candidates often identified two pieces of information but then failed to provide the additional information required ie the explanation of the purpose.

### Question 4.6

*State three checks that would be completed when carrying out a fire resisting door maintenance inspection in relation to each of the following:*

- a) intumescent fire or smoke seals. (3 marks)*
- b) closing and opening devices.(3 marks)*

### **Examiner Feedback**

Part a) was often answered well but part b) was less well answered. Points that could have been provided in response to part b) included:

- open the door fully and check it closes without binding on the floor
- open the door to approximately five degrees and check again that it closes fully, engaging any latch or seal
- check the door closing speed to be approximately ten seconds from ninety degrees and ensure that the door does not slam
- ensure that doors are not being wedged open
- make sure that door hold-open devices are not straining the doors against the self-closing devices
- check that mechanical hold-open devices have not been fitted

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