

# IFE Level 3 Certificate in Passive Fire Protection

## Examiner Report – March 2020

### Introduction

Most candidates performed well in the examination with 70% of the candidates who sat the examination achieving a Pass. The pass mark for this examination is 72 (out of 120) marks. The average mark attained by candidates was 74. There were many high scores with some candidates demonstrating good knowledge across all areas of the syllabus and attaining 90 marks or above.

Candidates who were unsuccessful in the examination often omitted questions or failed to provide all of the information required by the questions. Candidates need to be aware of the full scope of the question asked and also to use the marks allocated to the question as a guide to how many relevant points are required.

### **Section 1 - Fire and Fire Protection**

As in previous examinations, candidates usually performed well on this part of the examination. There were 40 marks for this section of the examination and the average mark scored was 26.

#### Question 1

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

b) *Explain how passive fire protection can affect fire development.* (3 marks)

#### **Examiner Feedback**

Part a) was usually answered well with most candidates able to secure all five of the marks available.

Unfortunately, candidates were often unable to apply their understanding of passive fire protection when answering part b) with few candidates able to score all three of the marks available and many failing to score any marks at all. Candidates could have scored marks for points such as:

- passive fire protection is built-in protection so responds immediately to reduce/resist rapid fire spread
- flame-retardant coatings will slow down the rate of growth
- compartmentation will contain (resist) the fire for a specific period of time.
- passive fire protection is usually made from things that are non-combustible or of limited combustibility; this means that they are unlikely to readily ignite and aid fire spread
- at the flashover stage, passive fire protection provides its primary function of containment and insulation against the effects of heat.

## **Question 2**

*In relation to means of escape, explain the difference between “a place of reasonable safety” and “a place of total/ultimate safety”. (4 marks)*

### **Examiner Feedback**

Most candidates understood the difference between ‘reasonable’ as opposed to “ultimate” place of safety. However, the lack of detail in responses often meant that candidates scored only two of the four marks available. It was common for candidates to omit the fact that places of reasonable safety will provide safety for only a limited period of time.

## **Question 3**

*Describe three ways in which regular fire drills and alarm tests can improve the effectiveness of evacuation in the case of fire. (3 marks)*

### **Examiner Feedback**

This question was usually answered well with most candidates able to secure all of the marks available. Some candidates failed to appreciate that drills familiarise occupiers with the fire alarm signal.

## **Question 4**

*a) Explain what is meant by the term “integrity” and describe the factors that affect integrity. (3 marks)*

*b) Explain what is meant by the term “insulation” and explain the purpose of insulation. (3 marks)*

### **Examiner Feedback**

When responding to part a), candidates were usually able to explain the meaning of the term “integrity” but few went on to describe the factors that affect integrity as required by the question. This meant that marks were often missed.

Part b) was usually answered well.

## **Question 5**

*a) In relation to building materials, explain what is meant by the term “reaction to fire.” (1 mark)*

*b) Identify three factors that can be used in measuring how a material reacts to fire. (3 marks)*

### **Examiner Feedback**

Candidates often re-phrased the question when responding to part a) but a more precise explanation was required; ie in terms of building materials, “reaction to fire” is the degree to which a material may contribute to/retard the growth of a fire.

Many candidates appeared to guess when responding to part b). Candidates should be aware that the factors used in measuring how a material reacts to fire are: ignition; combustibility; spread of flame (over their surface); release heat (rate of fire propagation); production of flaming droplets and smoke.

### **Question 6**

*Explain the issues and limitations that need to be taken into consideration when interpreting fire testing and assessments. (4 marks)*

### **Examiner Feedback**

Most candidates were able to explain that the test data can be difficult to interpret and that the testing takes place in a controlled environment often different to the installation.

### **Question 7**

*Describe the steps that building managers can take to ensure that fire protection provisions in their premises are maintained. (5 marks)*

### **Examiner Feedback**

Most candidates appeared to appreciate the role of the Building Manager in respect of fire protection issues and gained good marks. Some stated that the Building Manager is the ‘Responsible Person’ which isn’t always the case whilst others mentioned the Fire Risk Assessment/Review process which wasn’t asked for. Examples of the types of points that would have secured marks were:

- ensuring that maintenance work does not breach essential fire compartmentation
- ensuring materials used are certificated/fit for purpose
- ensuring that any work carried out is completed by qualified individuals
- ensuring that tenants are aware of potential issues and report/comply with rules

### **Question 8**

a) *Explain what is meant by the term “active fire protection” and state how active fire protection differs from passive fire protection. (3 marks)*

b) *Identify and describe one type of smoke detection system. (3 marks)*

## **Examiner Feedback**

Part (a) was well answered with most candidates appreciating the difference between active and passive fire protection.

Part b) was less well answered and it was common for this part of the question to be omitted in responses. Marks could have been attained for identifying and describing any one of the following: Ionisation Smoke Detector; Optical Smoke Detector; Beam Smoke Detector; Aspirating Detector

## **Section 2**

### **Fire protection to the structural frame and retardant coatings**

There were 24 marks available for this section of the paper. The average mark scored was 15 (62.5%)

#### **Question 9**

*Describe three fire protection measures that may be considered to improve the fire resistance of timber frames. (6 marks)*

## **Examiner Feedback**

Candidates generally scored high marks on this question as most candidates were able to identify three fire protection measures. Some candidates identified only two measures and some failed to provide the description required and therefore lost the opportunity to secure higher marks. At level 3, candidates need to show in-depth understanding to score high marks.

#### **Question 10**

*Concrete framed buildings are usually designed and constructed in a way that is deemed to satisfy from a fire resistance perspective.*

*a) State, with an example, the circumstances when it would be necessary to provide added fire resistance to the concrete frame of a building. (2 marks)*

*b) Describe how additional fire resistance could be achieved. (2 marks)*

## **Examiner Feedback**

In responding to part a), many candidates provided a description of how concrete is affected by fire rather than giving examples of circumstances when additional fire resistance is needed. Candidates who scored marks for part a) usually identified circumstances when a building undergoes a change of use such as a conversion from an industrial building to residential apartments.

Part b) was generally answered well.

### **Question 11**

- a) *Explain how the thickness of a steel structure affects its fire resistance and the amount of structural fire protection required. (2 marks)*
- b) *Explain, using examples, how the shape of a steel structure can affect the performance of fire protection systems. (2 marks)*
- c) *Explain what is meant by “section factor” and state the formula. (3 marks)*

### **Examiner Feedback**

Parts a) and c) were generally answered well with most candidates gaining good marks.

Part b) was less well answered. The shape of a steel structure is one of the variables that needs consideration as hollow sections and cellular beams behave differently to standard I and H sections and often require specific fire test evidence. Few candidates recognised that reactive coatings (intumescent) insulate less well on some sections because of the way that the char develops on different shapes eg with circular hollow sections, char may crack more readily as the coating expands.

### **Question 12**

- a) *Describe the role of fire-resistant boarding when protecting structural steel sections. (1 mark)*
- b) *Describe two factors to be taken into account when using board systems for the fire protection of structural steel work. (2 marks)*

### **Examiner Feedback**

This question was usually answered well with many candidates securing full marks.

### **Question 13**

- a) *State two advantages of applying intumescent coatings off-site. (2 marks)*
- b) *State two challenges that can arise when intumescent coatings are applied off-site. (2 marks)*

### **Examiner Feedback**

In responding to part a), the majority of candidates were able to recognise the additional controls that are possible when application of protection takes place off-site.

Part b) was less well answered. Most candidates recognised the potential for damage during transportation and installation but many failed to mention that the additional assembly fixings also require the same protection.

## **Fire resisting walls, floors and ceilings and fire-resistant glazing**

There were 20 marks available for this section of the paper. The average mark scored was 13 (65%)

### **Question 14**

*Identify two different types of fire resisting floors and explain how each of them may be constructed in order to achieve the required fire resistance. (6 marks)*

#### **Examiner Feedback**

Most candidates were able to identify two different types of floor. However, some candidates lost the opportunity to secure higher marks for their responses as they focussed on the description of the type of floor rather than what could be done to achieve fire resistance.

### **Question 15**

*a) Describe two reasons why active fire curtains may be used to provide compartmentation. (2 marks)*

*b) State two locations where active fire curtains may be used. (2 marks)*

#### **Examiner Feedback**

This question was usually answered well with candidates demonstrating understanding of usage by providing appropriate examples.

### **Question 16**

*a) Explain the purpose of compartmentation. (2 marks)*

*b) Describe four factors to be taken into account when determining and installing fire protection for compartment walls. (4 marks)*

#### **Examiner Feedback**

Part a) was usually answered well and most candidates secured both of the marks available.

Part b) was less well answered with few candidates providing considered responses that showed understanding of what needed to be taken into account. Few candidates secured all four marks. Examples of points that would have secured marks include the following:

- the specified fire resistance period

- whether fire resistance is expected from one side or both sides of the separating element
- expected penetrations through the compartment wall and how they will be fire stopped
- loadbearing requirements/capacity
- local building regulations/codes

### **Question 17**

*Explain the difference between “integrity rated glazing” and “insulation rated glazing”.*

*(4 marks)*

### **Examiner Feedback**

Most candidates provided a good response to this question with many candidates able to explain the relevant E and EI ratings.

## **Fire stopping and penetration seals, cavity barriers, ductwork and dampers and the building envelope**

There were 24 marks available for this section of the paper. The average mark scored was 14 (58%).

### **Question 18**

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

*b) Describe, with the use of an example, the situations where each of the following would be used to achieve fire stopping:*

*i) penetration seals (2 marks)*

*ii) linear joint seals (2 marks)*

### **Examiner Feedback**

Part a) was usually answered well but part b) was less well answered.

### **Question 19**

*Describe four factors to be considered when specifying and installing fire stopping. (4 marks)*

### **Examiner Feedback**

This question was usually answered with candidates often to attain all of the marks available.

### **Question 20**

*In relation to fire stopping and sealing systems:*

- a) *describe the composition of mortars (compound) and provide examples of their use. (4 marks)*
- b) *describe the composition of sealant/mastic coatings and provide examples of their usage. (4 marks)*

#### **Examiner Feedback**

This question required detailed knowledge of the composition of mortars and sealant/mastic coatings. Where candidates were familiar with this subject area, they were able to attain high marks but few candidates did have this specialist knowledge so marks for this question were often low.

### **Question 21**

*Describe the differences between a fire damper and a smoke control damper. (6 marks)*

#### **Examiner Feedback**

Few candidates explained that dampers are installed in ducting where it passes through the compartment line. Most candidates concentrated on descriptions of how dampers work and some omitted to consider smoke control dampers in any way.

Candidates should be aware that smoke control dampers are part of a smoke control ductwork system designed to manage smoke in the event of fire. They are able to seal against cold smoke. They may be open or closed during a fire event to allow the smoke to be evacuated from the fire compartment and directed out of the building. Smoke control dampers will be managed via a centrally controlled system that operates alongside the detection systems in the building

## **Fire resisting doors, industrial shutters and associated hardware**

There were 12 marks available for this section of the paper. The average mark scored was 7 (58%)

### **Question 22**

*Explain the advantages of using a doorset when compared to a door assembly. (4 marks)*

#### **Examiner Feedback**

Most candidates scored well on this question with good comprehensive answers provided.

### **Question 23**

*Describe three situations when an automatic door hold open/closure device should operate. (3 marks)*

#### **Examiner Feedback**

Many candidates gave examples of the location of automatic door closers e.g. doors in hospital corridors, but the question was asking WHEN they should operate. Good answers identified situations such as:

- on activation of a fire alarm
- when activated by a smoke detection system
- when electrical power is cut
- failure of the alarm/detection system
- operation of a manual over ride button/switch

### **Question 24**

*Describe the checks that you would carry out when inspecting the installation of ironmongery fixed to fire doors. (5 marks)*

#### **Examiner Feedback**

The question was focussed on the inspection of the installation of ironmongery. However, some candidates gave examples of types of ironmongery and others gave examples of components other than ironmongery.

Likewise, many candidates described general checks of fire doors such as gaps between the door and frame rather than concentrating on ironmongery which was specified by the question.

Candidates who secured marks identified five relevant checks such as:

- the door should be hung on a minimum of three hinges
- hinges should not be damaged or worn or allow the door to drop
- if door has a latch, it should operate correctly and be aligned with the striker plate
- the angle of the striker plate should be correct so that the door closes properly
- any knobs, handles bolt should be fire-resisting
- all knobs, handles and bolts should be securely fitted
- if the door has letter plate, this should have an additional device to prevent arson
- all the component parts should have supporting fire test evidence

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