

**L3CP**



**THE INSTITUTION OF FIRE ENGINEERS**  
Founded 1918 • Incorporated 1924

# **IFE Level 3 Certificate in Passive Fire Protection (603/3054/5)**

**Friday 13 March 2020**

**10.30 – 13.30**

## **Instructions to Candidates**

1. The time allowed for this examination is **THREE hours**.
2. You **must** record all of your answers in the answer book provided.
3. This examination paper contains two sections. You must answer **all** questions in both sections of the examination paper.
4. At the end of the examination, the answer book and this question paper will be collected by the invigilators. You will not be allowed to keep any examination stationery.

## Section 1

***There are 40 marks available for this section of the examination. You should answer all questions.***

### **Fire and Fire Protection**

1.
  - a) State the five stages of fire development. (5 marks)  

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

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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)  

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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)  

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4. In relation to fire resistance:
  - 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)  

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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)  

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6. Explain the issues and limitations that need to be taken into consideration when interpreting fire testing and assessments.

(4 marks)

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7. Describe the steps that building managers can take to ensure that fire protection provisions in their premises are maintained.

(5 marks)

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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)

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**[Please Turn Over]**

## Section Two

***There are 80 marks available for this section of the examination. You should answer all questions.***

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

9. Describe three fire protection measures that may be considered to improve the fire resistance of timber frames.

(6 marks)

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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)

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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)

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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)

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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)

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

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)

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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)

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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)

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**[Please Turn Over]**

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

(4 marks)

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

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)

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19. Describe four factors to be considered when specifying and installing fire stopping.

(4 marks)

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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)

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21. Describe the differences between a fire damper and a smoke control damper.

(6 marks)

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## Fire resisting doors, industrial shutters and associated hardware

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

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

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

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