

**L3D7**



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

**IFE Level 3 Diploma in Fire Science and Fire Safety (VRQ)**  
**Unit 7: Fire Investigation (D/507/7414)**

**Friday 17 March 2017**

**14.30 – 17.30**

**Instructions to Candidates**

1. The time allowed for this examination is **THREE** hours.
2. Candidates must answer **SIX** questions from the total of **EIGHT** questions set for this examination.
3. All questions carry equal marks and may be answered in any order. Candidates should follow the instructions provided in the question when composing their responses.
4. Candidates should record all of their answers in the answer book provided.
5. The question paper must be handed in with the answer book.

### Question 1

Define and briefly explain the characteristics of the following explosive events:

- a) deflagration (8 marks)
  - b) detonation (12 marks)
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### Question 2

In relation to electrical safety devices/circuit breakers:

- a) Describe the physical and operating features of a cartridge fuse and explain the fault conditions that will cause it to activate. (8 marks)
  - b) Describe the physical and operating features of a miniature circuit breaker (MCB) and explain the fault conditions that will cause it to activate. (6 marks)
  - c) Describe the physical and operating features of a residual current device (RCD) and explain the fault conditions that will cause it to activate. (6 marks)
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### Question 3

- a) The use of electricity has been determined as the cause of many fires. State the common reasons why electrical equipment, wiring and appliances may start a fire. (8 marks)
  - b) Describe how photovoltaic solar panels work and explain the main causes of fires within solar panel systems. (12 marks)
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### Question 4

- a) State the common types of glass and the situations in which the different types of glass can be encountered. (8 marks)
  - b) Describe the information that can be recovered from examining glass at a fire scene. (12 marks)
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### Question 5

With regards scene safety:

- a) Define the relationship between hazards and risks. (2 marks)
  - b) Explain how risk can be calculated. Include an illustration of a simple risk matrix. (7 marks)
  - c) The outcome of the risk assessment should provide an indication of the measures needed to manage or control the risk.
    - i) State three methods of controlling the risk. (3 marks)
    - ii) State eight examples of Personal Protective Equipment (PPE). (8 marks)
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### Question 6

You are investigating a fire scene that is suspected to have been deliberately set. The police have requested that you sample an item of real evidence for further analysis.

- a) Define what constitutes evidence in relation to fire scene evidence. (4 marks)
  - b) Explain what is meant by the term “Chain of Custody” which is sometimes known as “evidence continuity”. (6 marks)
  - c) Detail the measures that need to be taken to maintain or preserve the “Chain of Custody”. (10 marks)
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### Question 7

With the aid of a diagram, state and explain the four stages/phases of fire development within a compartment.

(20 marks)

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**[Please turn over]**

**Question 8**

- a) Define the term “accelerant”. (4 marks)
- b) State the two primary groups of flammable liquids used as accelerants and list the properties that make them efficient first fuels. (6 marks)
- c) Explain what is meant by flammability / explosive limits and stoichiometric mixtures. (10 marks)
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