

IFE Level 4 Certificate in Fire Safety and Fire Science

Unit 6 - Fire Investigation

Examiner Report – March 2015

Introduction

Candidates performed in line with previous years with 26% of candidates achieving a Pass.

As in previous years, many candidates appeared to lack the depth of scientific understanding required to assess and fully explain situations. Many candidates provided only brief responses and failed to demonstrate technical knowledge and understanding.

Question 1

- a) *Explain in detail static electricity, how it occurs and how it discharges. (8 marks)*
- b) *Describe the conditions that are necessary for a static arc ignition to be determined as the cause of a fire. (9 marks)*
- c) *Give three examples of flammable materials that can be ignited by a static electricity arc. (3 marks)*

Examiner Feedback

This question was often answered well with candidates providing detailed responses to all parts of the question.

Question 2

- a) *The fixed mains wiring within a domestic premises can be a potential cause of fire. Detail five faults within the fixed mains wiring that may lead to a fire. (5 marks)*
- b) *Overcurrent devices within domestic premises can be of importance from a fire investigation stand point. Explain five problems encountered with overcurrent devices that may lead to a fire. (5 marks)*
- c) *Describe the purpose of a residual current device (RCD)/ground fault circuit interrupter (GFCI) and explain how it works. (10 marks)*

Examiner Feedback

Some candidates confused wiring faults with faults on protective devices.

RCD was sometimes confused with MCB.

Question 3

With regard to the identification of a fatal fire victim:

- a) Identify the factors that may affect the reliability of a visual personal identification of a fire victim by close friends or relatives. (5 marks)*
- b) Briefly describe the more reliable and commonly adopted methods to identify fire victims. (10 marks)*
- c) The cause of death can be quite varied in a fire. One of the most common causes is the result of asphyxiation by carbon monoxide. List five other causes of death that may result. (5 marks)*

Examiner Feedback

Most candidates attempted this question. However, a number of candidates had difficulty in responding to all parts of the question; for example, some candidates did not appear to understand what was meant by “visual personal identification” in part a).

Many candidates were not able to identify causes of death other than asphyxiation in response to part c).

Question 4

- a) With regard to explosions and explosive combustion, define the following terms:
 - i. Explosive (2 marks)*
 - ii. Brisance (2 marks)*
 - iii. Deflagration (3 marks)*
 - iv. Detonation (3 marks)**
- b) With the aid of an example, describe an “electrical explosion”. (8 marks)*
- c) With regards to dust explosions, name two factors which determine the “explosive/flammability limits” of a particular substance. (2 marks)*

Examiner Feedback

Responses to this question were often poor with many candidates unable to provide the definitions required. Some candidates demonstrated only limited understanding of explosions.

Question 5

- a) “Drop down” is a form of fire damage known to fire investigators.
 - i. Describe “drop down” in the context of fire damage. (4 marks)*
 - ii. Describe three typical examples of where drop down may occur. (3 marks)*
 - iii. Explain the consequences of failing to recognise drop down damage. (3 marks)**
- b) With the aid of a diagram, define (with examples) the following terms:
 - i. Counter flow flame spread (5 marks)*
 - ii. Concurrent flame spread (5 marks)**

Examiner Feedback

Candidates generally provided good responses to part a). However, responses to part b) were usually very poor.

Question 6

The nature and degree of damage within a building caused by fire or the products of combustion can be affected by a number of conditions. Describe ten such conditions. (20 marks)

Examiner Feedback

This was a popular choice of option with candidates. However, candidates tended to provide brief lists rather than providing detailed descriptions and, as a result, few candidates achieved high marks.

Question 7

Recording the fire scene photographically plays a vital role in the investigative process. It is often divided into four distinct steps. Describe these steps and explain the purpose of each. (20 marks)

Examiner Feedback

Responses to this question were often poor. The four distinct steps are:

- Photograph exterior and perimeter of property
- Record extent of fire damages, potential ignition sources
- Document clearing of debris and evidence prior to removal including smoke, burn and charring patterns
- Panoramic to help produce multi-dimensional photos and sketches

Question 8

a) Using a lit cigarette and an item of upholstered furniture as an example, describe in detail the following:

- i. The process of smouldering combustion (with the aid of a diagram). (10 marks)*
- ii. The transition from smouldering to flaming combustion. (4 marks)*

b) What evidence would you look for if you wanted to confirm that a fire had commenced with a period of smouldering in an item of upholstered furniture? (6 marks)

Examiner Feedback

This question required candidates to provide a scientific description of the process. Candidates did not appear to understand the process of combustion or the transition from smouldering to flaming and few candidates achieved high marks.