L3D7

THE INSTITUTION OF FIRE ENGINEERS
Founded 1918 • Incorporated 1924

IFE Level 3 Diploma in Fire Science and Fire Safety

Unit 7: Fire Investigation (D/507/7414)

Friday 9 March 2018

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

a) Define the term “combustion”.

(5 marks)

b) Explain the combustion process in terms of the fire tetrahedron.

(15 marks)

Question 2

a) Define the term “limits of flammability” (also known as “flammable range”).

(5 marks)

b) Describe how dusts or finely divided solids undergo combustion and describe the characteristics of a dust explosion.

(15 marks)

Question 3

There are many reasons why electrical equipment, wiring and appliances might cause a fire to ignite.

a) Explain the term “resistive heating” and describe the circumstances in which it will occur.

(10 marks)

b) Describe how electrical cable reels may be the source of a fire.

(10 marks)

Question 4

a) Describe the properties that make flammable/ignitable liquids efficient first fuels (i.e. the fuel first ignited).

(5 marks)

b) Describe the patterns left in a fire scene that could indicate the presence or use of a flammable liquid/ignitable liquid and identify other materials or conditions that may cause similar patterns.

(8 marks)

c) Describe the common methods of detecting flammable/ignitable liquids and comment on how arson can be proved.

(7 marks)

Question 5

a) Define the terms and give the SI units of measurements for:

i) voltage

(3 marks)

ii) current

(3 marks)

iii) resistance

(3 marks)

iv) power

(3 marks)

b) Give the equations for and explain the relationship between:

i) Ohms Law

(2 marks)

ii) Power Formula

(2 marks)

c) A current of 8 amps flows through an appliance with a maximum resistance of 28.75 ohms. Calculate the power of the appliance.

(4 marks)

Question 6

a) Explain the importance of preparing for a fire investigation.

(3 marks)

b) Describe the necessary considerations and arrangements that ensure a methodical and effective investigation can be undertaken.

(17 marks)

Question 7

Describe the methods, indicators and factors to consider when determining the origin, cause and development of fire within a compartment or structure.

(20 marks)

[Please turn over]

Question 8

a) Describe the considerations and best practice to be taken into account when taking photographs or video footage during the course of a fire scene investigation.

(14 marks)

b) Describe two methods other than video or photographs that may be used for recording a fire scene and describe one advantage for each.

(6 marks)