

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 11 March 2016

14.30 – 17.30

Instructions to Candidates

1. The time allowed for this examination is **THREE** hours.
2. Candidates should 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) Explain what is meant by the 'Scientific Method' of investigating the scene of a fire. (5 marks)
- b) Using a diagram, describe the stages of an investigation following the scientific method. (10 marks)
- c) Explain what is meant by "forming and testing a hypothesis". (5 marks)
-

Question 2

- a) Explain the steps you would take to ensure that a fire scene is a safe working environment for you before entering the scene to conduct an investigation. Outline the factors that you would consider. (10 marks)
- b) In respect of the building utilities, explain how you would go about making the gas and electrical supplies within the building safe if both had been damaged by the fire. (10 marks)
-

Question 3

- a) Explain what is meant by the 'fire tetrahedron' and explain the component parts of it. Include a diagram and label the parts. (10 marks)
- b) Explain five factors at a fire scene that might determine the extent of combustion that takes place. (10 marks)
-

Question 4

With regard to the investigation of vehicle fires:

- a) Detail potential ignition sources that may be the cause of an accidental vehicle fire. (8 marks)
- b) Describe the circumstances that may lead you to suspect that a vehicle fire has been set deliberately. (12 marks)
-

Question 5

a) Explain how you would ensure that electrical wiring damaged in a fire is safe to work on during an investigation. (5 marks)

b) Explain how you would establish whether a fuse is in-tact or has blown during a fire. (5 marks)

c) Late one evening a fire has occurred in a factory where a lighting circuit feeds four external flood lights of different types. The first flood light contains a 500 watt halogen lamp. The second, third and fourth flood lights each contain 400 watt metal halide lamps. The owner has advised that these flood lights are not often all switched on at the same time but on the evening in question they were all left switched on. The circuit is protected by a 10 amp fuse and the cable used was rated 5 amps. The circuit voltage is 240 volts.

Calculate the total current flowing in the circuit and state whether or not the fuse protecting the circuit was large enough. (5 marks)

d) Assuming the fire was caused by this lighting circuit and using the information provided, explain what you think the most likely cause of the fire was and describe the other evidence that may be observed to support this hypothesis. (5 marks)

Question 6

a) Describe in detail the three types of explosions. (15 marks)

b) Define the terms:

i. Condensed Phase Explosion

ii. Vapour Phase or Dispersed Fuel Explosion

(5 marks)

Question 7

You are called to investigate a building fire. Detail the information that you would consider gathering from the fire brigade crews in attendance at the fire. (20 marks)

[Please turn over]

Question 8

- a) 'ELBOWS' is an acronym that relates to the established rules for making contemporaneous notes at the scene of an investigation. Outline the rules as defined by the ELBOWS acronym. (8 marks)
- b) Identify the information that you would record in contemporaneous notes. (6 marks)
- c) Explain the principles that underpin contemporaneous notes in relation to their future use including any legal obligations relevant to your country. (6 marks)
-