

**L3D2**



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

**IFE Level 3 Diploma in Fire Science and Fire Safety**

**Unit 2: Fire Safety (F/505/6006)**

**Thursday 12 March 2020**

**10.30 – 13.30**

**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 answers.
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) In terms of fire testing, define:
- i) stability (1 marks)
  - ii) integrity (1 marks)
  - iii) insulation (2 marks)
- b) State the main functions of a fire door. (4 marks)
- c) State six features of a fire door. (6 marks)
- d) Describe the testing process for determining the fire resistance of a timber fire door. (6 marks)
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### Question 2

- a) State the function of a column in a building and state the type of loads that columns are designed to carry. (2 marks)
- b) Describe how the following materials behave in fire and explain how this affects the fire protection required:
- i) reinforced concrete (4 marks)
  - ii) timber (4 marks)
  - iii) steel (4 marks)
- c) Explain why steel is used to reinforce concrete. (6 marks)
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### Question 3

a) Describe the operation principles of each of the following types of detectors and state the types of fires they are best suited to detecting:

i) ionising detector

(4 marks)

ii) optical (photoelectric) detector

(4 marks)

b) Describe the difference between a smoke detector and a smoke alarm.

(4 marks)

c) Describe the operating principles of a smoke and heat exhaust ventilation system and explain how these types of systems aid escape from a large modern building during fire conditions.

(8 marks)

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### Question 4

You have been asked to provide fire safety advice at a large-scale construction site.

a) Outline the issues that should be covered in the fire safety plan for the site.

(10 marks)

b) State the responsibilities of the site Fire Safety Co-ordinator.

(10 marks)

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### Question 5

You have been asked to advise a large organisation on the development of a fire safety training programme for use across the whole organisation.

Describe the issues that should be included in the programme.

(20 marks)

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**[Please turn over]**

### Question 6

a) You have been asked to draw up a plan to reduce both the potential for, and the consequences of, an arson attack in a local school. Outline the main areas your plan would target.

(15 marks)

b) Describe five motivations that might lead to the deliberate setting of a fire.

(5 marks)

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### Question 7

a) Describe the information that would be included in a typical emergency plan for a residential care premises.

(15 marks)

b) Staff expected to undertake the role of fire marshals (fire wardens) will require more comprehensive training than other members of staff. State five areas where additional training will be required.

(5 marks)

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### Question 8

a) Describe the purpose of deluge systems.

(3 marks)

b) Describe the design and method of operation of three types of sprinkler head.

(9 marks)

c) State the design principles of a recycling sprinkler system.

(2 marks)

d) Sprinkler life safety systems need to be more reliable than basic systems. Describe the requirements of a life safety system which will enhance their reliability.

(6 marks)

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