



THE INSTITUTION OF FIRE ENGINEERS  
Founded 1918 • Incorporated 1924

## IFE Level 3 Certificate in Fire Science, Operations, Fire Safety and Management

# Unit 1: Fire Engineering Science (Y/505/5749)

## SAMPLE QUESTIONS

### Introduction

This document has been provided to aid candidates in their preparation for the IFE Level 3 certificate in Fire Science, Operations, Fire Safety and Management. The document is in two parts:

Part 1: A selection of sample questions mapped to the syllabus for Unit 1: Fire Engineering Science.

Part 2: A copy of the front cover of the examination paper, enabling candidates to familiarise themselves with the instructions for responding to the examination paper.

### Part One - Sample Questions

#### General Information about the Examination

The examination is one hour in duration. There are two sections:

Section one: There are 20 marks available for this section. It contains 20 multiple choice questions and each question is worth one mark. Questions may target any assessment objective within the unit. Candidates should attempt all questions in this section.

Section Two: There are 30 marks available for this section. Questions in this section take the form of short written answer questions and provide candidates with the opportunity to demonstrate their knowledge and understanding across the content contained in the unit. Candidates should attempt all questions in this section.

## Sample Multiple Choice Questions

What is 245 million expressed in standard form?

- a)  $2.45 \times 10^8$  (Ans)
- b)  $2.45 \times 10^9$
- c)  $24.5 \times 10^8$
- d)  $24.5 \times 10^9$

Syllabus reference: 1.1

What is the volume of a sphere which has a diameter of 10m (metres)? Answer expressed in cubic metres.

- a)  $52.36\text{m}^3$
- b)  $523.6\text{m}^3$  (Ans)
- c)  $418.88\text{m}^3$
- d)  $4188.8\text{m}^3$

Syllabus reference: 1.2

If a gas within a container is heated to four times its original temperature, what effect will that rise in temperature have on the pressure of the gas?

- a) The pressure of the gas will decrease by a quarter
- b) The pressure of the gas will increase fourfold (Ans)
- c) The pressure of the gas will decrease by a half
- d) The pressure of the gas will increase twofold

Syllabus reference: 2.2

Which of the formulae below is correct for calculating the Jet Reaction (R) of a nozzle, when pressure is expressed in bars and diameter in millimetres?

- a)  $R = \frac{1.57 Pd^2}{10}$  Newtons (Ans)
- b)  $R = \frac{10}{175 Pd^2}$  Joules
- c)  $R = \frac{157Pd^3}{10}$  Newtons
- d)  $R = \frac{157 Pd}{10}$  Newtons

Syllabus reference: 3.5

What is the Water Power (WP) of a pump delivering 2,300 litres of water per minute at a pressure of 6 bars? (Answer expressed in Kilowatts.)

- a) 23 kW (Ans)
- b) 230 kW
- c) 2,300 kW
- d) 23,000 kW

Syllabus reference: 3.6

Lead, platinum, copper and aluminium are examples of:

- a) elements (Ans)
- b) compounds
- c) mixtures
- d) hydroxides

Syllabus reference: 4.1

Water would not be a good choice of extinguishing media when dealing with burning magnesium because a reaction between water and magnesium could lead to the production of which flammable product?

- a) Oxygen
- b) Carbon monoxide
- c) Hydrogen (Ans)
- d) Methane

Syllabus reference: 4.5

If a power supply of 5 Volts is applied to a circuit with 50 Ohms resistance, what is the resulting current? (Answer expressed in Amperes.)

- a) 250 Amps
- b) 55 Amps
- c) 10 Amps
- d) 0.1 Amps (Ans)

Syllabus reference: 5.1

### Sample Short Written Answer Questions

Guidance note to candidates: When responding to short answer questions, candidates are advised to note the instructions provided in the question and also the number of marks available. For example, a question that includes the instruction “state three” and indicates that there are three marks available requires three brief points; likewise, a question with an instruction to “explain” something and which has six marks allocated to it requires six in-depth points relevant to the question in order to secure each of the marks available.

Explain what is meant by the term *Force*. Using an example, demonstrate how *Force* is calculated. (4 Marks)

Syllabus reference: 1.4

Explain, using examples, how an increase in heat affects solids. (6 marks)

Syllabus reference: 2.2

- a) Define the term *jet reaction* and state how this is measured.
- b) Calculate the reaction of the water leaving a 25mm nozzle if the pressure is 7 bar. (6 marks)

Syllabus reference: 3.5

- a) Define the term *compound* and illustrate your answer with appropriate examples.
- b) Define the term *mixture* and illustrate your answer with appropriate examples. (4 marks)

Syllabus reference: 4.1

Define Ohm's Law and, using examples, show how Ohm's Law can be applied to solve electrical problems. (4 marks)

Syllabus reference: 5.2

## **Part Two - Examination Paper Instructions**

Instructions for candidates undertaking the examination are provided on the front cover of the question paper. A copy of the front cover is provided below.

The instructions direct candidates to provide their answers in the answer book provided. A copy of the front cover of the answer book which includes the instructions for candidates is provided below. Candidates are required to complete the answers to the multiple choice questions on the relevant page of the answer book (page 2, which is on the reverse of the front cover of the answer book). A copy of the format of this page is provided below.

# L3C1



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**IFE Level 3 Certificate in Fire Science, Operations,  
Fire Safety and Management (VRQ)**

**Unit 1: Fire Engineering Science (Y/505/5749)**

**SAMPLE EXMINATION PAPER FRONT COVER**

### **Instructions to Candidates**

1. You **must** use the answer book to record all of your answers.
2. This examination paper contains two sections. You must answer **all** questions in both sections of the examination paper.
3. At the end of the examination, the answer book and this question paper will be collected by the invigilators. You will not be allowed to keep any examination stationery.
4. The time allowed for this examination is **one hour**.

**EXAMINATION REFERENCE NUMBER**

**CENTRE NUMBER**

**CANDIDATE NUMBER**

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## IFE Level 3 Certificate in Fire Science, Operations, Fire Safety and Management (VRQ)

### Sample Answer Book Cover

**Instructions to Candidates**

Write your **Examination Reference Number**, **Centre Number** and **Candidate Number** in the correct spaces at the top of this page. Please write nothing in the grid below.

The answers to the multiple choice questions must be recorded on the sheet provided on page 2 in this answer book. The responses to the written response questions in Section 2 should be provided on the lined paper in this answer book.

You may write the answers to the questions in section 2 of the examination in either pencil or pen.

Any blank pages in this booklet may be used for working out answers.

At the end of the examination the question paper and this answer book will be collected by the invigilators. You will not be allowed to keep any examination stationery.

<u>Section</u>	<b>Multiple Choice Question Section</b>	<b>Short Written Response Section</b>	<u>Marker's Initials</u>	<u>Total Mark</u>	<u>Grade</u>
<u>Original Mark</u>					
<u>Moderated Mark</u>					
<u>Final Mark</u>					

## MULTIPLE CHOICE QUESTION ANSWER SHEET

Please use a pencil to record your answers. Mark your answers by striking them through like this:

1 [a] [b] ~~[c]~~ [d]

Please do NOT mark with ticks, crosses or circles. If you make a mistake, erase it completely.

1 [a] [b] [c] [d]

11 [a] [b] [c] [d]

2 [a] [b] [c] [d]

12 [a] [b] [c] [d]

3 [a] [b] [c] [d]

13 [a] [b] [c] [d]

4 [a] [b] [c] [d]

14 [a] [b] [c] [d]

5 [a] [b] [c] [d]

15 [a] [b] [c] [d]

6 [a] [b] [c] [d]

16 [a] [b] [c] [d]

7 [a] [b] [c] [d]

17 [a] [b] [c] [d]

8 [a] [b] [c] [d]

18 [a] [b] [c] [d]

9 [a] [b] [c] [d]

19 [a] [b] [c] [d]

10 [a] [b] [c] [d]

20 [a] [b] [c] [d]

**Score:**