

# Level 3 Certificate in Fire Science, Operations, Fire Safety and Management (All Examinations)

## Examiner Report on March 2016 Examinations

### Introduction

Candidates generally performed well in all of the examinations and there was a high pass rate for all subjects. As in previous examination sessions, candidates performed least well on the Fire Engineering Science examination.

Many candidates for all papers appeared to have studied only part of the content of the syllabus and, as a result, performed very well in some aspects of the paper but then failed to achieve any marks at all on other subject areas. Candidates should be aware that each of the examinations is designed to test **all** of the sections of the relevant unit syllabus so the questions will be drawn from each of the different topics set out in the syllabus.

### Fire Engineering Science (L3C1)

#### General

59% of the candidates who sat the examination achieved a Pass. This was a small increase on the pass rate in 2015.

As in previous years, candidates performed least well on questions that tested the topics in the electricity section of the syllabus.

#### Multiple Choice

Although most candidates achieved at least half of the marks available on the multiple choice section of the examination, few candidates attained high marks.

Many candidates performed well on questions involving calculations and chemistry. Questions testing understanding of the topics in the heat section of the syllabus (particularly specific heat capacity and the gas laws) and in the electricity section of the syllabus (particularly calculations) were often answered incorrectly.

#### Short Answer Questions

**Calculation of the capacity of a length of hose:** This question was often answered well and candidates were able to achieve high marks. Some candidates omitted to show the unit of measurement (ie litres) in their response.

**Heat:** Most candidates were able to identify convection, conduction and radiation as the methods by which heat may be transmitted. However, some candidates provided only a list of the methods. The question required candidates to “describe” the methods and to “illustrate each description with an example” so candidates that provided only a list of methods did not address the specific requirements of the question.

**Density:** This question was not answered well and few candidates attained high marks. Some candidates did not respond to this question at all and others responded to part a) only.

Some candidates provided good definitions of “density” and of “relative density” in response to part a) although definitions of “relative density” were well often less formed.

In response to part b), many candidates were not able to carry out the calculation of the density and relative density of the given substance.

**Smothering and Cooling:** This question was often answered well with many candidates providing full and correct explanations as to how the methods can be used in extinguishing fire. Many candidates attained full marks for their response to this question.

**Electrical Cables:** Few candidates were able to identify two types of electrical cable and provide an example of situations where the different type of cables might be used. Some candidates correctly identified PVC and its use in domestic appliances. However, there seemed to be limited understanding of the use of other types of cable such as mineral insulated (in fire alarm circuits) or copper sheathed (eg in industrial applications).

**Electrical Circuit Protection:** This question was often answered poorly. Few candidates were able to describe the reasons for providing electrical circuit protection in response to part a). Candidates often performed better on part b) and were able to give examples of electrical circuit protection such as fuses and circuit breakers.

## Fire Operations (L3C2)

### General

Standards were high with 80% of candidates passing the examination. Most candidates appeared to have prepared well for the examination and to have familiarised themselves with the knowledge and understanding requirements from across the syllabus.

The main area of weakness for most candidates was in the understanding of equipment and the use of equipment. Questions addressing this topic were the least well answered in both the multiple choice section and also in the short answer section of the examination.

### Multiple Choice

Most candidates answered at least half of the questions correctly and achieved 10 or more of the marks available. However, there were few very high scores on this section of the paper.

Candidates generally performed best on the questions focussing on the incident command element of the syllabus. The least well-answered questions were those requiring detailed understanding of the operational components of equipment such as hydrants and high expansion foam generators. Candidates also made errors in relation to the ideal safe working angle for pitching of ladders and on the type of equipment used to check for radioactive contamination.

## Short Answer

Many candidates appeared to have prepared well for this element of the examination and some candidates were able to achieve high marks. It was notable that the majority of candidates answered questions fully and provided explanations as required by the questions; there were few examples of candidates providing only brief lists of points where the questions specifically asked for descriptions or explanations.

**Pre-planning for a possible fire at a petrochemical site:** Many candidates provided a good response to this question. However, some candidates failed to focus on “planning” as required by the question and structured their responses as though dealing with a current incident rather than a planning context. Candidates who wrote about factors such as access to the site and the types and locations of chemicals at the site and explained why these factors should be considered in the planning process achieved high marks.

**Salvage operations:** Nearly all candidates answered this question well and many candidates achieved all four of the marks allocated to this question. Candidates clearly understood the actions that could be taken to prevent damage to goods.

**Safety considerations at a road traffic incident:** Candidates generally answered this question well and achieved a high proportion of the marks available. Most candidates identified relevant safety issues and then explained how they would address the specific issues they had identified.

**Operating principles of reciprocating primers:** This question was the least well answered question and few candidates achieved marks for their responses to the question.

**Operating rules when donning and wearing breathing apparatus:** Many candidates listed the steps to be followed when donning breathing apparatus rather than focussing on “operating rules” as specified in the question. Candidates who achieved high marks referenced rules such as checking communication equipment before entry and at regular intervals, maintaining communication with BA entry control officer and team, monitoring pressure gauge at regular intervals and liaising with the entry control officer when exiting the risk area.

## **Fire Safety (L3C3)**

### General

Standards were high with 77% of candidates passing the examination. This pass rate was a significant improvement on performance in 2015. Candidates performed well on both the multiple choice and short answer sections of the examination.

### Multiple Choice

Candidates generally performed well on this element of the question and some candidates attained very high scores. Candidates performed particularly well on questions that tested understanding of fire safety practice, building materials and building structures.

The least well-answered questions were questions that related to the operation of equipment such as dry risers and some candidates did not identify correctly the disadvantage of air sampling smoke detection systems.

## Short Answer

**Fire Doors:** There were many excellent responses to this question and most candidates achieved a good mark for their response to this question. In response to part b), a few candidates listed the features of a fire door but then failed to explain how these features contribute to fire safety. Candidates that did not fully answer the question were not able to achieve the marks available.

**Sprinkler Systems:** Many candidates were unable to describe the sprinkler systems set out in the question (ie deluge system and alternate wet and dry systems). Some candidates provided some information about alternate wet and dry systems but there appeared to be less understanding of deluge systems. As candidates were often unable to describe the systems, they usually then failed to identify where the systems are typically installed.

**Carbon Dioxide Installations:** This question was generally answered well. Candidates performed particularly well on part b) where most candidates correctly identified two risks to people.

Most candidates achieved some of the marks available for part a) which required the identification of factors to be taken into consideration when determining the requirements of the system. Candidates often omitted to include issues such as whether or not the hazard was enclosed and whether or not the fire was likely to spread.

**Unwanted Fire Signals and False Alarms:** Many candidates were unable to explain the difference between unwanted fire signals and false alarms in response to part a). Part b) was often answered well with candidates able to describe actions to reduce unwanted fire signals and false alarms.

**Fire Drills:** Few candidates explained four reasons for carrying out fire drills. Candidates often identified points such as enabling the building occupants to learn or be reminded of the sound of the alarm, the location of fire exit routes and the location of the fire assembly point. However, few candidates identified the need to identify any areas of the building where the alarm is not sufficiently audible, ensure that all fire exit routes from the building are available and free from obstruction and assess the speed and efficiency with which a building can be evacuated.

**Access arrangements for firefighters:** Candidates often failed to describe the arrangements fully; eg candidates often mentioned the need for access for vehicles but failed to link this to arrangements to enable use of appliances to supply water and to facilitate rescues.

## **Management and Administration (L3C4)**

### General

Standards were very high with 84% of candidates passing the examination.

The majority of candidates who achieved a Pass attained marks between 25 and 35; few candidates achieved over 40 marks. The main reason for this was that responses to the Short Answer section of the paper often lacked depth; candidates often demonstrated some basic understanding but then failed to apply this or to expand their responses as required by the question. In addition, candidates often provided a great deal of irrelevant information and/or failed to answer the questions as set.

Most candidates performed significantly better on the multiple choice section of the examination than on the Short Answer section of the question paper.

### **Multiple Choice**

Many candidates achieved high marks for this section of the examination. The majority of candidates performed well across all of the different topics within the syllabus.

### **Short Answer**

There were many poor responses to this element of the examination with many candidates appearing to tackle the examination without having undertaken sufficient study.

**Responsibilities of employees in relation to health and safety in the workplace:** A significant number of candidates were unable to identify four different responsibilities.

Some candidates identified only one responsibility and then re-phrased it in different ways (for example a list of four different types of safety concerns that would need to be reported); other candidates provided lists of generic responsibilities (such as “meeting targets”) and did not focus their points on health and safety at all. Several candidates mis-read the question and wrote about employer rather than employee responsibilities.

**Relationship between front line manager and human resources department:** Nearly all candidates were able to provide examples of occasions when a front line manager would work with the human resources department – the most common examples related to disciplinary and recruitment processes.

However, candidates often failed to demonstrate understanding of the relationship – few candidates referenced the specialist and company-wide role of human resources teams and the subsequent opportunity to seek advice on policies/protocols. There were many misunderstandings in relation to the reporting structures, relationships between departments and the general role of human resources; this meant that many candidates were unable to “explain” how the relationship between a front line manager and the human resources department would work. Some candidates wrote more generally about resources (eg equipment and budget) and appeared to have no understanding of human resource departments.

**Effects of poor communication:** This question was generally answered well and many candidates achieved full marks. Most candidates followed the instruction to “explain” the effects that they had identified and were able to secure full marks for their response.

**Maslow’s Hierarchy of Needs:** This question was generally not answered well. The majority of candidates were able to obtain one or two marks for describing the hierarchy. It was notable, however, that although candidates were often able to list the components of the hierarchy, few identified that individuals who have had their needs met at one level would then need to move to the next level.

Few candidates explained how managers could use the hierarchy in motivating their staff; for example, there were few references to training/job changes to stimulate and motivate individuals at the higher levels of the hierarchy.

Some candidates wrote generally about motivation and appeared to have no knowledge at all of Maslow’s hierarchy.

**Setting up record systems:** Those candidates that identified and explained factors to be taken into account (such as access for users, ease of use in inputting data, storage, cost, purpose etc) achieved high marks. Some candidates focussed on listing areas of content to be covered in the database. Candidates who focussed on content (rather than factors to be considered in setting up the system) achieved only limited marks ie for identifying scope and purpose of content.

**Training to meet the needs of job roles:** This question was generally answered very poorly as few candidates provided responses that reflected the specific requirements of the question. Candidates were asked to describe types of training that individuals might undertake to ensure that they had the skills and understanding needed to carry out their role (with examples of **when** the training would be appropriate).

Many candidates listed terms such as “practical,” “theory,” “classroom” and “assessment” but omitted to relate them back to the question asked. Some candidates described methods of training in depth or wrote about training tools eg there were many references to lectures and Powerpoint but these were rarely linked back to the purpose of the training. Likewise, candidates sometimes listed subjects for training but then failed to link this back to the purpose of the training.

Those candidates that identified training such as induction, refresher training, CPD, specialist, on-the-job training etc and supported this with examples (eg new starters learning how to operate equipment, specialist training in management skills for those seeking promotion, CPD to ensure individuals stay up to date with changes in equipment/procedures etc) achieved high marks. Responses that were not related to the question did not attain marks.

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