

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

Examiner Report on October 2016 Examinations

Introduction

As in previous examination sessions, candidates generally performed least well on the Fire Engineering Science examination.

Most candidates attained a higher proportion of the marks available for the multiple choice element of the question papers than they did for the short answer element of the question papers. Candidates should be aware that they need to demonstrate depth and breadth of understanding in order to attain high marks on the short answer element of the paper.

Fire Engineering Science (L3C1)

General

Candidates performed less well than on previous examinations with only 42% of the candidate who attempted the examination achieving a Pass. Candidates usually performed slightly better on the multiple choice element of the examination with most candidates achieving just over half of the marks available; however, most candidates achieved fewer than half of the marks available for the short response questions which had a negative impact on the final mark achieved.

It was notable that UK candidates generally performed less well than international candidates on this examination.

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 mathematical calculations. However, many errors were made in calculating density and water power.

Many candidates were unable to identify that starvation as a method of fire extinction involves limiting the fuel to the fire and many made errors in identifying the type of flame described as turbulent diffusion flames.

Short Answer Questions

Moment of Force: This question was not answered well and many candidates failed to achieve any of the marks available. Some candidates confused “moment of force” as required by the question with force and provided the formula for calculating force. The formula required was:

Moment = Force X Distance. Candidates should have explained that force is measured in newtons (N) and that the distance is measured in either metres or centimetres.

Effect of heating gas: Most candidates were able to give an example in relation to firefighting and to attain all of the marks available for this element of the question. However, many candidates were unable to give a full scientific explanation of the process underway. Few candidates explained the effect of heat on the movement of molecules.

Effect of friction on the pressure of water flowing through a hose: This question was often answered well. However, some candidates failed to appreciate that the question was focussed on the pressure of water flowing through a hose and the way that this can be affected by friction; as a result, some irrelevant information was presented. Some candidates correctly identified issues such as the diameter of the hose and the inside surface of the hose but failed to expand their points to explain (as required by the question) how these factors affected flow.

Use of water as an extinguishing medium: This question was generally answered well with most candidates able to provide appropriate examples and brief explanations for situations where water would, or would not, be an appropriate extinguishing medium. Most candidates were able to achieve four of the six marks available. Higher marks could have been gained for the inclusion of more scientific detail in the explanations.

Electricity – definition of terms and calculation of power output: This question was generally answered very poorly and few candidates attained more than two of the eight marks available. In response to part a), candidates were generally unable to define terms such as “watt” and “current.” Very few candidates were able to apply their understanding to carry out the straightforward calculation of power output required by part b).

Fire Operations (L3C2)

General

Standards were good with 82% of candidates achieving a Pass.

Many candidates achieved high marks on the multiple choice element of the paper. However, the average mark attained on the short written answer questions was generally below half of the marks available. Candidates often attained a Pass due to their high level of performance on the multiple choice element of the paper which compensated for a poorer level of performance on the short written answer element of the paper.

Multiple Choice

Most candidates performed well on the multiple choice section of the examination with the majority of candidates achieving around 75% of the marks available for this element of the examination.

As in previous examinations, the least well-answered questions were those requiring detailed understanding of the operation of equipment such as pumps and foam generators.

Short Answer

Many candidates provided only brief responses and few candidates achieved high marks on this element of the examination. Candidates often failed to address the specific and full requirements of the question; where answers were not fully focussed on the question, few, if any, marks were attained.

Inner cordon: Most candidates achieved at least one of the four marks available for this question. However, few candidates provided four relevant points and attained all four marks. Candidates often omitted to identify that the incident commander has ultimate responsibility for the control of the inner cordon area or that the area is likely to be taped off and to have an officer controlling access to it.

Benefits of ventilation: Candidates often listed (rather than described) one or two points (rather than describing “three” benefits as required by the question. Some candidates wrote at length about different types of ventilation without focussing on benefits. Unfortunately, this information was not relevant in the context of the question and therefore did not secure marks.

Examples of the types of points required included:

- Ventilation can assist escape by the restricting the spread of smoke on escape routes, improving visibility and extending available egress time
- It can aid rescue operations by reducing smoke and toxic gases which hinder search activities and endanger trapped occupants

Actions to be taken when discovering that people may be inside a building on fire: Candidates often identified only one or two points relevant to the context of people being inside the building. Many wrote at length about tackling the situation but omitted to give due consideration to the possible location and rescue of individuals inside the building. There were eight marks available for this question but few candidates achieved more than four marks.

Reasons for poor flow in mains: Candidates often identified one or two correct reasons. However, the points were not expanded to provide an explanation. As the question required an explanation, candidates who omitted to expand their points sufficiently were unable to attain all of the marks available. For example, candidates often identified “use by other users” but did not go on to explain that this can vary depending on the time of day and that this will subsequently affect the amount of water available to the fire service.

Operating extension ladders: This question was usually answered poorly. Most candidates failed to consider overhead obstructions, training of operators, safety of others in the area and the need to avoid damage so that equipment remains safe and fit for purpose.

Fire Safety (L3C3)

General

Candidates generally performed less well than in previous examinations. 52% of candidates achieved a Pass. Candidates generally performed better on the multiple choice element of the examination than on the short written answer element.

Multiple Choice

Questions relating to fire safety practice were often answered particularly well. Questions related to fixed installations were also answered well with candidates showing good understanding of drenchers, dry risers and inert gas firefighting installations.

Many candidates made errors in responding to questions about fire doors, insulated glass products and hollow-fired clay blocks. Few candidates were able to identify the operating principles of heat detectors.

Short Answer

Behaviour of concrete columns in fire: Most candidates identified one or two factors that affect the behaviour of a concrete column but few candidates were able to attain four marks for their responses. Some candidates correctly identified the relevance of the thickness of the column and some identified the effect of reinforcement with steel bars. Few candidates explained how cement can contract when heated due to the removal of moisture, the importance of the aggregate used in the mixture or the effect of firefighting water striking the column.

Fire-retardant treatments for timber: Most candidates successfully identified the two types of treatment. However, few provided the description required by the question; the lack of description meant that they limited the marks that they could attain to half of the marks available.

Principles of design of a sprinkler system: There were six marks available so candidates were required to identify six design features. The question was generally answered well. Most candidates identified at least two valid points and many candidates were able to attain most of the marks available by demonstrating a good understanding of sprinkler systems.

Ventilation systems: This question was often answered poorly with few candidates identifying the types of system as natural ventilation and powered ventilation. Some candidates described roof vents and correctly linked this to the principle of natural buoyancy of hot smoke. Marks were awarded for these descriptions.

Automatic Smoke Detectors: Few candidates achieved high marks for their response to this question and there appeared to be a limited understanding of the principles of operation of the two types of smoke detectors covered by the question. Although some candidates correctly described the operation of beam smoke detectors, they often failed to provide a correct example of a situation where these detectors might be appropriate as required by the question. Few candidates were able to describe the operation of aspirating detectors and most candidates failed to achieve any marks at all for this element of the question.

Factors affecting the time taken to escape from a building: Most candidates were able to identify at least two or three relevant factors. However, few candidates identified six factors as required by the question.

Some candidates failed to follow the instruction to “explain” the factor. This meant that responses were not sufficiently expanded to attain marks. Candidates should be aware that the provision of single word answers will not be adequate to explain an issue: eg providing only the word “occupancy” did not provide enough information to demonstrate understanding of how this issue could have an impact on escape time and therefore marks could not be awarded.

In responding to the question, many candidates failed to consider factors such as the psychology of behaviour (people may panic or react slowly as they do not believe there is a real fire) or the effect of management input into evacuation planning and training.

Management and Administration (L3C4)

General

Standards were very high with 86% of candidates passing the examination.

The majority of candidates who achieved a Pass attained between 25 and 35 marks; 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 better on the multiple choice section of the examination than on the Short Answer section of the question paper and attained a higher proportion of the marks available when responding to multiple choice questions.

Multiple Choice

The average mark achieved for this element of the examination was 15 (ie 75% of the marks available for this element of the question).

Candidates appeared to have some understanding of all areas of the syllabus. However, a few questions, where a more detailed understanding was required appeared to cause problems for many candidates. Few candidates recognised the description of a business plan and many were unable to recognise the description of matrix management. Other questions which caused problems for some of the candidates related to types of management styles, local budgetary control and issues to be considered when evaluating the benefits of technical training.

Short Answer

There were many poor responses to this element of the examination and few candidates achieved very high marks.

Candidates often provided responses that were not an appropriate level and which did not demonstrate the higher level of understanding of an organisation expected from managers. This was particularly noticeable in respect of the question on health and safety management systems and the question on the relationship between department and organisation objectives.

Health and safety management systems: This question required candidates to demonstrate understanding of the “management systems” in place in an organisation to underpin health and safety.

Many candidates failed to appreciate that the emphasis was on management systems. Examples of the type of systems that could have been covered included ensuring that policies and procedures

were in place, ensuring that resources were available to implement systems, ensuring that reviews were carried out so that improvements could be made. Many candidates focussed on specific issues such as the use of PPE and risk assessments without considering the wider management angle in their responses.

Contribution of department level objectives to organisation objectives: Few candidates achieved high marks for their response to this question as few were able to explain the way that departments operate within an organisation to contribute to strategic objectives and delivery of targets. There was little understanding of performance management and coherent planning and delivery across an organisation.

Requirements for an effective system of discipline: Most candidates were able to describe discipline procedures but few articulated clearly what made the system effective. This meant that many attained only a small proportion of the marks available. Examples of points that should have been provided in the responses included: the policy should be published and made available to everyone so that all staff are aware of what is required and how the system works; staff should have confidence that the system will be applied consistently and fairly.

Actions where a team member is performing poorly: Most candidates identified the need to talk to the individual and to determine the reason for poor performance. Some candidates identified possible actions such as arranging training or counselling where this was required. However, few candidates referenced the need to address the performance by setting targets and timescales for improvement and/or taking follow-up action to review performance and to ensure that the agreed targets/outcomes are being attained.

Record-Keeping: This question was generally answered well and most candidates attained their highest mark for this section of the examination on this question. Most candidates were able to successfully identify and explain the importance of at least two (but not always three) different types of records.

Exercises: This question was often answered poorly and few candidates achieved full marks. Many candidates did not appear to be aware that the three ways in which exercises could be carried out are live exercises, table-top exercises and discussions. As a result of being unable to outline the types of exercises, few candidates were able to give advantages for each of the different methods.

Many candidates wrote about exercises as though they were types of learning models and did not relate their responses back to incidents. A few candidates wrote about management styles.

Date issued: December 2016