

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

Examiner Report on October 2020 Examinations

Introduction

As in previous examination sessions, performance was particularly good on the Fire Operations examination and on the Management and Administration examination. Candidates performed least well on the Fire Engineering Science examination.

In order to achieve a pass in these examinations, candidates need to achieve at least 50% of the marks available on the examination paper (ie 25 marks).

Fire Engineering Science (L3C1)

General

34% of the candidates who sat the examination achieved a Pass.

As in previous examinations, it appeared that some candidates were not prepared for the examination and had underestimated the level of technical understanding required to pass the examination. Few candidates were able to demonstrate the detailed and precise level of understanding required to pass examinations in this subject area.

Multiple Choice Questions

There were 15 marks available for the multiple choice questions. The average mark achieved was 9.

Candidates generally performed best on the questions that addressed mathematics and geometry and many were able to complete the required calculations correctly.

Questions on hydraulics and electricity were the least well answered. Few candidates were able to complete the calculation of jet reaction correctly or to demonstrate understanding of the effect of a venturi within a pipe. In terms of electricity, under half of the candidates were able to recognise that potential difference between points is measured in volts.

Short Written Answer Questions

The average mark attained for this section of the paper was 12. There were 35 marks available.

In order to attain marks in an examination of this type, candidates are required to demonstrate precise use and understanding of technical terms and processes. Unfortunately, few candidates demonstrated a sufficiently high level of understanding to attain high marks. As in previous examinations, some candidates appeared to guess at answers based solely on their assumption as to the meaning of one or more words within a given term. There were many vague, sparse and generally incorrect responses.

Characteristics of gases: This question was very poorly answered and many candidates resorted to quoting Boyle's Law, Charles' Law or the Ideal Gas Equation rather than responding to the question. Where candidates did attempt to provide characteristics, they often suggested examples that were applicable to solids or liquids rather than gases.

Examples of characteristics that could have been presented in responses include:

- low density - gases contain scattered molecules that are dispersed across a given volume and are therefore less dense than in their solid or liquid states.
- expandability/ indefinite shape or volume - the random movement of gas molecules allows them to expand or contract to assume the volume of the container holding them.
- diffusivity/ miscibility - given the large amounts of space between gas molecules, two or more gases can mix quickly and easily with one another to form a homogeneous mixture.
- pressure - gas molecules are in constant motion. The pressure varies according to the amount of gas confined to a given container's volume, the temperature and the pressure.

Difference between power and energy: Some candidates answered this question well and some provided the correct formula for power. However, others appeared to guess at the meaning of the terms and some listed types of energy (kinetic, potential) rather than answering the question.

Difference between conduction and radiation: Whilst some candidates demonstrated good understanding in responding to this question, others were clearly unfamiliar with these methods of heat transmission. Many candidates wrote about convection which was not required by the question and many failed to appreciate that radiation does not need an intervening medium.

Factors affecting loss of pressure of water flowing through a hose: The question asked candidates to describe the factors but some candidates listed factors without providing the required descriptions eg candidates stated "diameter of hose/pipe" without expanding their response to explain that the wider the hose/pipe, the less the frictional loss.

Several candidates provided irrelevant answers as they explained why practical lift is less than the maximum theoretical lift. This information was not required so no marks could be awarded.

Difference between a compound and a mixture: Few candidates understood that compounds contain two or more atoms of different elements that are chemically bound together to form molecules which are all exactly the same whilst a mixture is formed when two or more substances are mixed together but do not chemically react and bond.

Difference between flaming and smouldering combustion: This question was answered poorly with few candidates demonstrating understanding of the two types of combustion.

Firefighting foam: This question was usually answered well with most candidates able to score full marks. Some candidates provided irrelevant information about application techniques or characteristics of foam. These points were not required and therefore did not attract marks.

Ohm's Law and calculation of current: In responding to part a) of the question, candidates often failed to quote Ohm's Law correctly. Candidates should be aware that Ohm's Law states that the current through a conductor between two points is directly proportional to the voltage across the two points.

The calculation of current required by part b) was usually answered well with many candidates scoring most, or all, of the marks available; however, some candidates failed to show amps as the unit in their response and therefore did not secure the mark available for identifying this.

Explanation of the term "insulator" in reference to electricity: Despite the question identifying that the question was in the context of electricity, some candidates wrote about insulation in the context of heat. This meant that some irrelevant responses were provided that did not secure marks. Other candidates confused insulators with fuses and circuit breakers.

Fire Operations (L3C2)

General

Standards were extremely high with 97% of candidates achieving a Pass.

Candidates generally performed well on both the multiple choice and short answer sections of the paper.

Multiple Choice Questions

Candidates generally performed well on this section of the examination. There were 15 marks available and the average mark obtained was 12.

The least well answered questions were those that related to operational equipment. The questions where most errors were made were those that related to positive displacement devices and branch pipes.

Short Written Answer Questions

Candidates performed well on this part of the examination with the average mark obtained being 24.

Dynamic Risk Assessment: Most candidates were able to describe the purpose and use of a dynamic risk assessment and to secure most, if not all, of the marks available.

Offensive and Defensive Mode: Candidates general described the modes correctly but many omitted to provide the examples required by the question or gave incorrect examples which meant that they did not achieve all of the marks available.

Preservation of Evidence at the scene of a fire: This question was usually answered well with most candidates appearing to be familiar with the procedures followed and thereby scoring full marks.

Benefits of tactical ventilation: Some candidates performed well on this question but others did not provide sufficient detail in their responses to score high marks. Candidates scored marks for points such as:

- it can assist escape by 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
- it can improve the safety of firefighters by reducing the risk of flashover
- it can speed attack and extinguishment by removing heat so that firefighters can enter a building early and removing smoke and improving visibility making it easier to locate and deal with the fire
- it can reduce property damage where the fire can be located and tackled more quickly and by limiting the movement of smoke and hot gases, restrict the spread of fire.

Risks to personnel carrying out rescues in confined spaces: This was the least well answered question. Although candidates often scored marks for considering factors such as loss of consciousness due to heat or gases/lack of oxygen and the risks from the people being rescued who may be in a state of panic, they often omitted to consider the risk of injury or entrapment. Some candidates assumed the question was about sewers or silos and went into specifics on these situations which led to some irrelevant answers.

Initial survey at an incident: This question was usually answered well. However, many candidates did not give any consideration at all to the possibility of rescues or casualty care being needed.

Road traffic incident: Most candidates appeared to be familiar with incidents of this type and were able to identify relevant control measures and thereby attain all of the marks available for the question.

Extension ladders: Many candidates did not consider safety precautions as required by the question. Rather than explaining precautions, they listed steps in ladder drills without explaining the specific risks.

Thermal imaging cameras: Nearly all candidates were able to describe the use of these cameras and attain all of the marks available for the question.

Fire Safety (L3C3)

General

58% of candidates achieved a Pass.

Those candidates who were unsuccessful in passing the examination usually failed to provide sufficient detail or precision in the responses provided to the written answer questions in section two of the paper.

Multiple Choice Questions

The average mark obtained for this section of the paper was 9.

Candidates generally performed best on questions testing understanding of fixed installations such as drenchers, dry risers and inert gas installations; however, some candidates made errors in relation to bulk dry powder installations and also the different types of fixed foam installations.

Few candidates were able to identify the correct operating principles for heat detectors or to identify the most effective detector for identifying slow smouldering fires.

Questions relating to construction materials were usually answered well but errors were made when answering questions relating to hollow protection and solid construction.

Short Written Answer Questions

Responses often lacked sufficient detail to secure all of the marks available. Candidates did not always answer the question that had been set. Sometimes candidates appeared to make assumptions or to provide guesses where they did not have specialised knowledge; this was particularly the case in relation to the questions on water spray projector systems and life safety systems.

Fire retardant treatments for timber: Many candidates were able to identify that the two types of treatment are surface coating/intumescent paint and impregnation. However, many did not provide sufficient detail to secure the marks available for the description. Some candidates omitted to include the required examples of limitations of these types of treatments.

A common error was to write about the use of sacrificial timber rather than to focus on fire retardant treatments as required by the question.

Safety features of a fire door: This question was generally answered well with most candidates securing 3 or 4 of the 4 marks available.

Life safety sprinkler systems: This type of system is specifically listed in the syllabus but it appeared that few candidates were familiar with it or with the additional enhancements required by such a system. Examples of points that would have secured marks include the following:

- should be a wet type sprinkler system
- all steps must be taken to maintain continuity and reliability of water supply
- the system should be zoned with each zone being controlled by a separate stop valve
- a zone may require the installation control valves set to be duplicated so that one set of valves can be serviced whilst the system remains operational
- no zone shall extend to part of building under separate ownership

- no zone should extend beyond one floor
- only one zone of a multi-zone system can be shut down at one time
- all stop valves and electrical switches indicating that the valves are in the correct operating mode shall monitor alarm valves
- means shall be provided to initiate visual and audible warnings when the pressure in the sprinkler tank falls to the point at which the pump should start.

Water spray projector systems: some candidates were able to score full marks for this question but many others confused water spray projector systems with sprinkler systems and wrote about wet and dry sprinkler systems instead.

The two types of water spray projector systems are:

- high velocity systems which are used to extinguish fires and are primarily used on fires involving medium or heavy oils or flammable liquids
- medium velocity systems which are primarily protective and provide protection to plant systems and are used to protect against/prevent explosions

False alarms: This question was often answered well with candidates able to explain the effects of false alarms on the fire service and to explore the actions that can be taken to reduce them; marks were awarded for actions taken by premises holders as well as by the fire service.

Factors affecting the time taken for occupants to evacuate: this question was usually answered well and many candidates secured all four of the marks available.

Actions taken by building managers to ensure fire safety arrangements are in place and maintained: There were five marks available for this question but many candidates presented fewer than five points in their responses. Examples of points that would have secured marks include the following:

- ensuring that Fire Risk Assessments are carried out and reviewed regularly
- providing and maintaining clear means of escape
- making sure fire doors are kept closed
- regularly checking for damage to fire doors and other passive fire protection systems
- displaying Fire Exit signs
- ensuring emergency lighting is in place and working
- ensuring that fire detection and alarm systems are in place and working
- conducting fire drills
- ensuring maintenance is carried out by suitably qualified people

Management and Administration (L3C4)

General

Candidates generally performed well with 90% of the candidates who sat the examination achieving a Pass.

Multiple Choice Questions

Most candidates performed well on the multiple choice element of the paper. There were 15 marks available and the average mark obtained for this section of the paper was 12.

Most candidates appeared to have some understanding of all areas of the syllabus. The questions that were least were answered were those that related to the content of risk registers, terms used in Maslow's Hierarchy of Needs and the benefits of devolved financial management schemes.

Short Written Answer Questions

The average mark obtained for this part of the paper was 21. There were 35 marks available.

Department-level objectives: Most candidates were able to explain how department level objectives can contribute to organisation performance. Some candidates failed to make the link back to strategic objectives and therefore secured few, if any, marks for their response to the question.

Benefits of teams: There were many excellent responses to this question with some candidates securing all four of the marks available. Some candidates slipped into describing management issues such as spans of control instead of keeping their focus on the benefits for organisations that arise from grouping staff into teams.

Work-related stress: This question was usually answered well with most candidates recognising the health and safety issues involved. Some candidates failed to consider the implications and consequences of stress and this limited the marks that could be obtained.

Communication: Most candidates scored a high proportion of the marks available for this question. Part a), which asked candidates to identify the potential barriers to communication, was generally answered better than part b) which asked candidates to explain how a manager can assure themselves that communication has been successful

Delegation: The question asked candidates to explain the term delegation and describe four factors that managers take into account to ensure that delegation is effective. Candidates often failed to appreciate that the manager retains responsibility for the task, and the outcomes of the task, that is delegated.

Some candidates confused giving directions about the work to be done with delegation and many were unable to identify four different factors in their response. There was a great deal of repetition and some vagueness in responses.

Managing personal information: This question was usually answered well with candidates understanding the information that needs to be held and also the factors informed in holding and storing personal information.

Training Needs Analysis (TNA): This question was the least well answered question in this section of the examination. Some candidates confused TNA with performance appraisal. Candidates should be aware that a TNA is designed to help an organisation identify the precise areas where training is required.

When carrying out a TNA in respect of an individual employee, organisations consider issues such as existing skills and competence, the knowledge and understanding needed for the job role, the effect of changes in job role, the effects of legislation, the effects of changes in equipment and the outcome of performance reviews.

External training: the advantages and disadvantages of external training appeared to be well understood and most candidates attained at least some of the marks available for this question. Those candidates who scored lower marks for the question usually found it harder to identify advantages of external training than disadvantages.

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