

IFE Level 4 Certificate in Fire Safety and Fire Science

Unit 2 - Fire Safety

Examiner Report – March 2015

Introduction

Candidates performed in line with previous years with 28% of candidates achieving a Pass.

As in previous examinations, many candidates failed to follow the instructions in the question and did not “describe” or “explain” as the questions required. Many candidates failed to examine the specific situations set out in the examination questions from all angles when presenting their responses; this meant that they did not demonstrate the in-depth technical understanding required at Level 4.

Some candidates appeared to respond to questions from the perspective of operational firefighters rather than taking a fire engineering perspective.

Question 1

Many shopping malls have smoke and ventilation systems. Explain the general design principles of smoke and ventilation systems relevant to their application in shopping malls. (20 marks)

Examiner Feedback

This question was generally well answered as many candidates were able to explain the operation of systems. Although not specifically required, some candidates illustrated their responses with excellent diagrams.

However, some responses lacked the level of detail and understanding required at Level 4 and some candidates described the way that smoke and ventilation systems operate but omitted to explain the design principles in relation to the protection of occupants and escape routes in shopping malls. Candidates who omitted to consider the context failed to explore issues such as the protection of walkways, escape speeds of pedestrians and the size of reservoirs. It was noted that the interaction between ventilation and sprinkler systems was poorly understood. Many candidates did not mention the importance of the expected fire size in the design process.

Question 2

Explain the factors influencing rapid and extensive fire spread in tall buildings (high rise). (20 marks)

Examiner Feedback

Fire can spread both internally and externally in tall buildings and good responses considered both internal and external factors. The building needs to be designed well and built well. Once completed it must be managed properly.

In recent years there have been a considerable number of high profile fires in tall buildings all over the world and some candidates used examples to enhance their answer.

The key word in the question was *explain*; candidates who presented their responses as a simple list attained few marks. Many candidates did not discuss external fire spread at all; very few mentioned fire spread from falling burning debris or the effect of flammable external cladding and fittings.

Some candidates mentioned the stack effect without explaining it; similarly the Coanda effect was poorly understood. Few candidates mentioned the effect of wind.

Question 3

You have been asked to advise your National Archive which houses many irreplaceable and valuable historical documents. Documents from the archive are available for examination by the public. Recently a small fire in a light fitting has led to an urgent review of fire safety.

Develop an action plan to reduce the likelihood of another similar fire (or from another source) and to protect the archive for future generations. Your plan must include recommendations for the short-term, medium term and longer-term. (20 marks)

Examiner Feedback

There were some good responses with some candidates identifying sophisticated systems such as oxygen reduction and demonstrating a good understanding of prioritisation and the allocation of short, medium and long term changes.

However, many candidates focussed on the general process of risk assessment and/or development of risk registers; as these generic and high level statements did not address the specific requirements of the question, candidates that took this approach usually achieved only low marks.

Recommendations that could have been covered in responses included a high security area for the most treasured artefacts, increased fire separation, smaller compartments, more sensitive alarms/detection (e.g. aspirating), limiting public access and digitising records where appropriate.

Fire reduction includes identifying the reason for the fire and taking steps to ensure that other light fittings do not suffer the same fault.

Question 4

- a) *Briefly explain how modern building design and use may impact on the fire safety provisions. (6 marks)*
- b) *Outline seven potential building design benefits from the provision of sprinklers in a building. (7 marks)*
- c) *A sprinkler system is to be provided within an office building which contains an atrium. What factors need to be considered that will affect the time at which the first sprinkler will operate? (7 marks)*

Examiner Feedback

Part a) of the question was the least well answered section of the question. Examples of modern features of design include the use of light weight steel, the inclusion of atria, and the development of 'green' buildings; candidates were expected to explain the impact on fire safety provision due to issues such as increased fire loading, the effects of delamination of some products and the use of external claddings.

In response to part b), many candidates discussed the benefits of sprinklers (in controlling fire) but did not discuss the *design* benefits which have been enabled by the use of sprinkles; examples of design benefits include increases in travel distance, compartment size, occupancy numbers, and decreases in escape route width and external separating distances.

Part c) asked for factors affecting the time of operation of sprinklers but some candidates focussed on design details in their responses.

Question 5

Many of the world's worst fire disasters leading to major loss of life have occurred in places of entertainment where people were expecting to enjoy themselves. Explain the factors, including human behaviour and the difficulties of evacuating a crowd, that you would take into account in managing the fire safety provisions in an indoor public entertainment venue that can hold up to 400 people. (20 marks)

Examiner Feedback

Most candidates identified the effect of alcohol or the atmosphere on the members of the public at the event but some omitted to explore the effects of human behaviour in detail such as people are unfamiliar with the premises, are slow to realise there is an emergency, reluctant to leave, tend to follow the crowd etc

Many candidates concentrated on physical fire safety measures but did not mention the importance of management and staff training. Many tragedies in entertainment venues have involved poor management. Examples of relevant factors that could have been covered and explained in responses include:

- control of ignition sources (such as fireworks)
- control of fuel load (eg flammable linings or temporary decorations)
- management of escape routes (ie security v means of escape)
- management control of the venue in terms of capacity/overcrowding
- control of lighting and noise

Question 6

You have been asked to advise the Chairman of the Board of a large independent department store. The store employs over 300 staff and at peak periods there may be 2000 customers inside the shop.

Make recommendations on the content of fire safety training to ensure relevant knowledge and understanding for:

- a) senior management and department heads who make strategic and policy decisions. (15 marks)*
- b) supervisors, full-time, part-time and temporary staff. (5 marks)*

Examiner Feedback

In general this question was poorly answered with candidates concentrating on general routines and low level staff training. As a result, many candidates achieved most, if not all, of the marks available for part b) but attained only low marks for their response to part a).

In response to part a) candidates often failed to appreciate that senior management plays a vital role in setting the organisational culture, policies and attitude to fire safety. There are legal, moral and business continuity implications. The company strategy is vital and senior managers must be able to plan for all contingencies including the worst case (such as a fire at peak trading time).

Question 7

You have been asked to give a lecture to some students of architecture on active and passive fire safety measures. Summarise the points that you would make, providing definitions of the terms “active” and “passive fire safety measures” and explanations of how these measures can contribute to fire safety and assist firefighting operations in the case of a fire. (20 marks)

Examiner Feedback

This was one of the most popular questions on the paper.

Most candidates were able to identify a range of active and passive measures. However, some candidates presented only brief lists of measures and omitted to explain how measures contribute to fire safety and assist firefighting operations. At level 4, brief lists of points do not demonstrate sufficient depth and breadth of understanding.

Most candidates were able to define the terms although some candidates provided only partial definitions and some candidates provided definitions that were not correct.

Few candidates mentioned degradation of passive measures either by interference from people or gradual wear and tear and the subsequent importance of maintenance arrangements.

Question 8

You have been asked to provide advice on the construction, installation and maintenance of an extraction system for the kitchen of a restaurant in a large hotel. Make recommendations and justify how each point you make provides fire safety. (20 marks)

Examiner Feedback

A kitchen extract system is designed to take away cooking fumes and can catch fire if not properly maintained or cleaned. Fire can spread throughout the building if there are no dampers or if it passes unprotected through compartment walls. It is not the same as a smoke extraction system, air conditioning or SHEVS.

The question asked for recommendations and *justification* for those recommendations. Candidates who did not provide any justifications or discuss design factors such as ease of maintenance, dampers, air intake, fire stopping did not attain good marks.