

IFE Level 3 Diploma in Fire Safety and Fire Science

Unit 2 – Fire Safety (Zone 2)

Examiner Report – March 2019

Introduction

31% of candidates attained a Pass. There were no really high scores and all candidates who passed attained either a Grade C or a Grade D.

Candidates performed best on questions 2 and 3. Candidates performed least well on question 4.

Question 1

- a) *Prepare a checklist of fire safety issues to be covered in the training of staff working in a large factory or warehouse premises. (14 marks)*
- b) *Staff who are expected to undertake the role of fire marshals or fire wardens are given a higher level of fire safety training than the average member of staff in order for them to be responsible for the fire safety within a designated part of a premises. Outline what would be covered in this higher level of fire safety training. (6 marks)*

Examiner Feedback

Few candidates scored high marks for this question.

In responding to part a), candidates often provided only brief responses despite the fact that 14 marks were available. There was a great deal of repetition with candidates often repeating the same points several times.

Part b) was often answered well. However, some candidates failed to distinguish between general fire safety training and the specific duties of fire warden. This meant that there was repetition with responses in part a) and therefore the candidates did not answer the question asked. Examples of points which could have been provided include:

- Checking for hazards and potential fire risks within their area
- Checking that first aid firefighting equipment and other fire safety is in place and working
- Organising members of the public, visitors and/or disabled persons to leave the premises in the event of a fire alarm
- Checking designated areas to ensure everyone has left
- Communicating and reporting information to the person in charge of the assembly point
- Using firefighting equipment if safe to do so
- Liaising with the fire service on arrival

Question 2

- a) *State the purpose of 'E' type fire resisting glazing and provide two examples of this form of glazing technology. (5 marks)*
- b)
 - i) *Explain what is meant by the term 'fire retardant substances'. (2 marks)*
 - ii) *Explain how fire retardant substances work to stop the burning process. (3 marks)*
- c) *State the two objectives achieved by providing fire resisting compartment walls and/or floors in buildings. (4 marks)*
- d) *Where ventilation ducts pass through a compartment wall or floor there are three methods that can be used to maintain the integrity of the wall or floor. Outline these three methods. (6 marks)*

Examiner Feedback

This question was the most popular option for candidates and the question was often answered well with many candidates attaining eight marks or above for their responses.

In responding to part a), candidates often referred to situations where E type fire resisting glazing might be used rather than providing examples of this form of glazing eg wired glass, laminated float glass, modified toughened glass, borosilicate glass etc

In responding to part b) candidates were often able to explain the term fire-retardant substances but few provided sufficient technical detail to secure all three of the marks available for part b)ii). Candidates should be aware that flame-retardants work to stop the burning process by interrupting the gas phase of combustion, limiting the process of decomposition by physically insulating the available fuel sources from the material source with a fire-resisting "char" layer diluting the flammable gases and oxygen concentrations in the flame formation zone by emitting water, nitrogen or other inert gases.

Parts c) and d) were usually answered well with candidates often securing all of the marks available for part c) and a high proportion of the marks available for part d).

Question 3

- a) *Describe the situations when and/or where is it appropriate to utilise visual alarm signals as part of an electric fire warning system. (6 marks)*
- b) *Describe the benefits of smoke and heat exhaust venting as part of the means of escape strategy for a large modern building. (6 marks)*
- c) *Outline the operating principles of a smoke and heat exhaust ventilation system. (8 marks)*

Examiner Feedback

Candidates usually performed well on parts a) and b) of the question.

However, part c) was often less well answered as few candidates were able to provide the detailed technical knowledge required. Many candidates chose to omit this part of the question. Candidates should be aware that the system operates in the following way:

- Buoyant smoke from a fire will rise into a smoke reservoir triggering the smoke detection system.
- This will either cause the exhaust vents to open or start the exhaust fans in a powered system.
- At the same time, the replacement air inlets will open so creating an air-flow in the protected area.
- The smoke reservoir will fill to within a predetermined depth.
- The installed fire suppression system maintains the fire size.
- The final temperature of the smoke remains within design limits.
- The system is then held in equilibrium until the fire is extinguished.

Question 4

- a) *State the objectives of fire safety advice provided for property and business continuity purposes. (2 marks)*
- b) *Outline the primary means of achieving those objectives in order to improve property and business continuity protection. (6 marks)*
- c) *State five factors that influence an evacuation strategy for a building. (5 marks)*
- d)
- Identify two human behavioural factors that should be considered when planning evacuation and means of escape from a building. (2 marks)*
 - Describe five ways in which building design and evacuation strategies can assist in aiding evacuation. (5 marks)*

Examiner Feedback

Part a) and part b) of this question were specifically focused on property and business continuity. Candidates did not always focus their responses on this context and this meant that some of the responses provided were not completely relevant. In response to part a), candidates often omitted to consider the need to reduce the chance of fire starting or, in the event of fire starting, to reduce the consequences of that fire. Most candidates secured at least some of the marks available for part b) by identifying actions such as controlling ignition hazards, ensuring that good housekeeping and storage is in place for combustible hazards, providing smoke management or providing firefighting facilities such as automatic suppression systems to reduce fire severity.

Responses to part c) were often good with most candidates referencing issues such as occupancy, use of the building, size, compartmentation etc.

Part d)i) was usually answered well with most candidates able to secure both of the marks available. Part d)ii) was often less well answered. Whilst candidates provided information on evacuation, few recognised that the focus was on ways to assist evacuation. Examples of points that could have secured marks were as follows:

- Ensure that movement of people in smoke is minimal with low concentrations of smoke being assured.
- Staff should be designated to assist those with disabilities or other occupants who will require assistance such as those unfamiliar with the building.

- The rate of evacuation should be maintained by frequent broadcast messages urging people to leave the building
- Arrange staff intervention at the points where the evacuation impetus slows.

Question 5

- a) *Explain why hydraulic hose reels are suitable as the first line of attack in buildings as an alternative to portable fire extinguishers. (5 marks)*
- b) *What are deluge systems designed to protect and how do they function? (3 marks)*
- c) *State the design principles of a recycling sprinkler system. (2 marks)*
- d) *Describe the design and method of operation of five types of sprinkler head. (10 marks)*

Examiner Feedback

Part a) of the question was usually answered well.

In responding to part b), many candidates confused deluge systems with drencher or sprinkler systems and wrote about these systems instead of deluge systems. Candidates should be aware that deluge systems are designed for special hazards fires where intense fires with a very fast rate of fire propagation is expected to occur and it is desirable to apply water simultaneously over the complete zone in which fire may originate.

In responding to part c), few candidates appeared to understand the design principles of a recycling sprinkler system. Candidates appeared to guess at the way this system might work. Candidates should be aware that this type of sprinkler system will turn itself off once a fire has been cooled below a certain temperature and then turn itself back on if the temperature rises again.

Some candidates failed to recognise that the focus of the question was on sprinkler heads and this meant that they provided responses that were largely irrelevant and therefore scored few, if any, marks. The types of sprinkler heads that could have been covered included pendant, ceiling, sidewall and recessed and concealed.

Question 6

You are required to carry out a fire risk assessment on a horse stabling building. Describe the control measures that should be considered in relation to the risks specific to this type of premises. (20 marks)

Examiner Feedback

There were 20 marks available for this question but most candidates provided only brief responses and identified only a few relevant issues. The average mark attained for this question was six.

The type of points that could have been covered included:

- To allow horses to be released quickly from the stables it may be necessary to increase the number of exit doors considered appropriate for people to escape
- Routes and exit doors to be used by horses need to be wider and higher than those used by people (at least 2.4m high and 1.2m wide).
- Fastenings on exit doors used for evacuating animals need to be quick release
- Establish a safe compound for the horses to be accommodated after being evacuated.
- Select appropriate fire detection
- Using audible warning devices may have an adverse effect on the horses' reactions, making them unpredictable.
- Consider using external visual warnings and off-site alarms.
- Safe storage of flammables like hay away from ignition sources.
- Keep stocks of flammable materials to a minimum in the stables
- Establish safe areas for outside contractors e.g. farriers or blacksmiths to work.
- Consider hot work permit system
- Consider fire risk arising from self-heating manure heaps.
- Implement a "no smoking" policy
- Provide appropriate firefighting equipment

Question 7

- a) *What do the abbreviated terms ASET and RSET denote? (2 marks)*
- b) *Define the terms ASET and RSET. (4 marks)*
- c) *A common fire engineering approach to the analysis of the conditions in a building in the event of a fire is the ASET vs RSET comparison. What is the basic aim of this approach? (2 marks)*
- d) *Explain what is meant by passive fire protection. (2 marks)*
- e) *Outline the measures that can be taken to reduce the hazards and risks of 'dead end' conditions in buildings. (10 marks)*

Examiner Feedback

This question was a popular option for candidates but few candidates attained high marks. Many of the candidates that attempted the question secured most of their marks for their responses to parts d) and e).

In responding to part a), some candidates failed to appreciate that ASET stands for Available Safe Egress Time and RSET stands for Required Safe Egress Time. Without this basic understanding, candidates struggled to answer parts b) and c). Candidates should be aware that ASET is defined as the time between fire detection and the onset of conditions which are hazardous to continued human occupation; RSET is defined as the amount of time, measured from fire ignition, that is required for occupants to evacuate a building or space and reach the building exterior or a protected exit enclosure.

Most candidates were able to explain what is meant by passive fire protection.

Part e) was often answered well with candidates usually able to identify at least some of the measures that can be taken to reduce risks.

Question 8

- a) *For each of the following, describe when it would be in use and provide an example of the types of places where each would be used:*
- i) maintained emergency escape lighting (2 marks)*
 - ii) non-maintained emergency escape lighting (2 marks)*
- b) *State the areas of a building that would normally be covered by emergency escape lighting. (10 marks)*
- c) *The standby batteries of emergency escape lighting have duration periods of around 180 minutes or around 60 minutes. Describe the circumstances when it would be appropriate to install a system with:*
- i) a 180-minute duration standby battery (4 marks)*
 - ii) a 60-minute duration standby battery (2 marks)*

Examiner Feedback

This question was the least popular option for candidates. Parts a) and c) were often answered poorly and candidates generally attained most, if not all of their marks for this question for their response to part b).

Candidates should be aware that maintained escape lighting is normally on all of the time and it is normally used in places of assembly such as theatres and cinemas whereas non-maintained lighting will operate only when the normal lighting fails and an example of its use is in places of work.

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