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# Examiners' Report

## NEBOSH NATIONAL DIPLOMA IN OCCUPATIONAL HEALTH AND SAFETY

### UNIT B: HAZARDOUS AGENTS IN THE WORKPLACE

**JULY 2018**

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# Introduction

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NEBOSH (The National Examination Board in Occupational Safety and Health) was formed in 1979 as an independent examining board and awarding body with charitable status. We offer a comprehensive range of globally-recognised, vocationally-related qualifications designed to meet the health, safety, environmental and risk management needs of all places of work in both the private and public sectors.

Courses leading to NEBOSH qualifications attract around 50,000 candidates annually and are offered by over 600 course providers, with examinations taken in over 120 countries around the world. Our qualifications are recognised by the relevant professional membership bodies including the Institution of Occupational Safety and Health (IOSH) and the International Institute of Risk and Safety Management (IIRSM).

NEBOSH is an awarding body that applies best practice setting, assessment and marking and applies to Scottish Qualifications Authority (SQA) Accreditation regulatory requirements.

This report provides guidance for candidates and course providers for use in preparation for future examinations. It is intended to be constructive and informative and to promote better understanding of the syllabus content and the application of assessment criteria.

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Any enquiries about this report publication should be addressed to:

NEBOSH  
Dominus Way  
Meridian Business Park  
Leicester  
LE19 1QW

tel: 0116 263 4700  
fax: 0116 282 4000  
email: [info@nebosh.org.uk](mailto:info@nebosh.org.uk)

## General comments

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Many candidates are well prepared for this unit assessment and provide comprehensive and relevant answers in response to the demands of the question paper. This includes the ability to demonstrate understanding of knowledge by applying it to workplace situations.

There are other candidates, however, who appear to be unprepared for the unit assessment and who show both a lack of knowledge of the syllabus content and a lack of understanding of how key concepts should be applied to workplace situations, which is an essential requirement at Diploma level.

This report has been prepared to provide feedback on the standard date examination sitting in July 2018.

Feedback is presented in these key areas: responses to questions, examination technique and command words and is designed to assist candidates and course providers prepare for future assessments in this unit.

Candidates and course providers will also benefit from use of the 'Guide to the NEBOSH National Diploma in Occupational Health and Safety' which is available via the NEBOSH website. In particular, the guide sets out in detail the syllabus content for Unit B and tutor reference documents for each Element.

Additional guidance on command words is provided in 'Guidance on command words used in learning outcomes and question papers' which is also available via the NEBOSH website.

Candidates and course providers should also make reference to the Unit B 'Example question paper and Examiners' feedback on expected answers' which provides example questions and details Examiners' expectations and typical areas of underperformance.

## Unit B

# Hazardous agents in the workplace

- Question 1** Window cleaners frequently use extending ladders. They unload the ladders from the roof of their van, carry them to position and extend them to reach higher windows. When they have cleaned the windows, they load the ladders back on to the roof of the van before moving to the next location.
- (a) **Outline** manual handling risk factors when using these ladders. **(7)**  
*You are **not** required to include any risks relating to working at height in your answer.*
- (b) The employer wants employees to store the ladders inside the van and not on the roof.  
**Comment** on how this change could affect the manual handling risks. **(2)**
- (c) **Outline ONE** change in working practice that could *eliminate* the manual handling risks from using extending ladders for the window cleaners. **(1)**

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This question assessed candidates' knowledge and understanding of learning outcome 9.2: Explain the assessment and control of risks from repetitive activities, manual handling and poor posture.

Some candidates had knowledge of the TILE (task, individual, load, environment) approach to manual handling risk assessment, but did not give sufficient detail about each of the specific risk factors. Candidates who were familiar with and able to apply the detailed range of risk factors, described in schedule 1 of the HSE guidance L23, performed well on this question. Course providers should note that L23 is specifically referred to in the syllabus and in the tutor references.

A scenario is described in the question and therefore candidates are expected to apply their knowledge of manual handling risk factors to the scenario. For example, by outlining that the task will involve pulling the ladders off the roof of the van and then pushing the ladders back on at the end of the task.

It is clear from the description in the scenario that this is a repetitive task, as the window cleaners have to repeat the manual handling activities at a number of sites in a working day.

Many candidates did not recognise that the load, the extension ladders, could be unstable and likely to shift if the ladder sections start to move during handling. Neither did candidates outline the risks that may result when carrying out this outdoor task in high winds.

A number of candidates did not take note of the instruction given in italics in part (a) and so wasted time including risks relating to working at height, in their part (a) answer.

Most candidates were able to provide valid responses to parts (b) and (c) of the question. The change of working practice described in part (b) has the potential to reduce some of the manual handling risks such as reaching upwards, but may also introduce new risks such as the need to stoop when placing the ladders inside the van.

In part (c) marks were available for changes in working practice such as cleaning the higher level windows from the ground floor using tools with extending handles or using a mobile elevated work platform (MEWP).

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- Question 2**
- (a) **Outline** legal requirements for lighting in a workplace as required by the Workplace (Health, Safety and Welfare) Regulations 1992. (2)
- (b) **Identify THREE** symptoms associated with visual fatigue. (3)
- Employees in a large open-plan office with windows and artificial ceiling lights carry out work using display screen equipment for a significant part of their working day. A number of employees are complaining that the lighting in the office is not suitable.
- (c) **Consider** what features of the *lighting* in the office might have led to these complaints. (5)
- 

This question assessed candidates' knowledge and understanding of learning outcomes 10.2: Explain the need for suitable and sufficient lighting in the workplace, units of measurement of light and the assessment of lighting levels in the workplace; and 9.2: Explain the assessment and control of risks from repetitive activities, manual handling and poor posture.

When responding to questions relating to legal requirements, accuracy is important. The legal requirement for lighting in the workplace, as stated in the Workplace (Health, Safety and Welfare) Regulations 1992, is for it to be *suitable and sufficient*. Referring only to sufficient lighting is not correct, as the lighting also needs to be suitable for the nature of the work being carried out.

The legal requirements for lighting, in the Workplace (Health, Safety and Welfare) Regulations 1992, extend to a number of other features, including the provision of emergency lighting, when the failure of artificial lighting can present a danger. Many candidates did not include this in their response to part (a).

Part (b) presented little difficulty with most candidates able to identify three symptoms of visual fatigue.

Part (c) covers both learning outcomes 10.2 and 9.2 as it relates to the use of display screen equipment (DSE), for which suitable and sufficient lighting is an important consideration. Those candidates who recognised this in the scenario, were able to gain marks by considering features such as the position of the lighting in relation to the DSE, or reflections from windows or artificial light fittings in the screens of the DSE, leading to the complaints.

Another lighting feature to consider, is the lighting levels being either too high or too low, and many candidates included this in their answer. Few candidates considered the lighting 'colour temperature' not being suitable, ie an unsuitable balance of red and blue light.

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**Question 3** A training organisation wants to introduce hand-held laser pointers for use by their trainers when presenting courses to students.

Recent media reports suggest that some hand-held laser pointers can contain Class 3B or Class 4 lasers.

- (a) **Identify** potential eye damage that could result from exposure to lasers with these classifications. (3)
- (b) **Outline** control measures that could help reduce the potential for eye damage to the trainers and students. (7)
- 

This question assessed candidates' knowledge and understanding of learning outcome 7.4: Outline the different sources of lasers found in the workplace, the classification of lasers and the control measures.

Answers to part (a) were often vague and therefore did not achieve the three marks available. Eye damage caused by lasers includes temporary loss of vision, flash blindness and retinal burns and can result in 'floaters'. Simply stating that the laser pointers could cause blindness is not sufficiently accurate for a diploma-level answer and therefore did not receive a mark.

The accidental and deliberate misuse of higher hazard classification laser pointers has featured in numerous news stories in the last 12 months, making consideration of this possible exposure to lasers topical. Course providers should refer to the Public Health England (PHE) advice on laser safety, which is listed in the references for Unit B (<https://www.gov.uk/government/publications/laser-radiation-safety-advice/laser-radiation-safety-advice#laser-pointers-or-laser-pens>)

The stem of the question implies that the hand-held laser pointers are to be used and therefore part (b) required an outline of how this use could be carried out safely. Therefore, a simple control measure is to only use laser pointers of lower hazard classifications. The PHE advice referred to above is clear that only class 1, class 2 or possibly class 3R laser pointers are appropriate in a training situation.

Marks were also awarded for more generic laser control measures, such as removing reflective surfaces in the training rooms and always pointing the lasers away from the direction of the students.

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- Question 4**
- (a) **Give** the meaning of 'work-related stress'. (1)
- (b) **Identify** potential signs that an employee could be stressed. (3)
- (c) **Outline** control measures that could help manage work-related stress in an organisation. (6)
- 

This question assessed candidates' knowledge and understanding of learning outcomes 8.2: Explain the identification and control of workplace mental ill-health with reference to legal duties and other standards; and 8.1: Explain the effects and causes of common types of mental ill-health within the workplace.

Part (a) required candidates to be familiar with the HSE definition of 'work-related stress': 'The adverse reaction people have to excessive pressures or other types of demand placed on them'. However, few candidates seemed to be aware of the meaning.

Candidates performed well in response to part (b) and could identify at least three potential signs of stress, such as mood swings, loss of motivation and also physical signs such as sweating or agitation. Answers to this part of the question helped boost the overall marks that candidates gained for this question, which was just above half marks.

In contrast, part (c) was not well answered. Candidates were aware of the stress management standards but had difficulty in translating this knowledge into control measures a manager could utilise. Promoting flexible working, providing a good working environment (including lighting, ventilation, etc) and having clearly defined roles and responsibilities, are all control measures that help to manage work-related stress.

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**Question 5** Schedule 2A of the Control of Substances Hazardous to Health Regulations 2002 (COSHH) sets out eight 'principles of good practice' for controlling exposure to hazardous substances. One of the eight principles is:

"Choose the most effective and reliable control options which minimise the escape and spread of substances hazardous to health."

(a) **Explain** why the use of personal protective equipment (PPE) is often *less* effective as a control option than installing local exhaust ventilation (LEV). (7)

(b) **Outline THREE** other 'principles of good practice'. (3)

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This question assessed candidates' knowledge and understanding of learning outcome 3.1: Explain the principles of prevention and control of exposure to hazardous substances (including carcinogens and mutagens).

The fundamental principles that are the basis for the COSHH regulations should be well known, however, the average mark for this question was around a third of the 10 marks available. Course providers should consider how this syllabus content is delivered to students as there continues to be confusion between the eight principles of good practice and the application of a hierarchy of control.

Part (a) focused on the one principle of good practice that does specifically relate to hierarchy of control. However, candidates had difficulty giving a full explanation of why personal protective equipment (PPE) is a less effective control measure. In the NEBOSH guidance document on command words 'explain' is defined as '*to make an idea or relationship clear*'. Therefore, taking a step-wise approach when setting out an answer is advisable. An explanation of the hierarchy of control was a sensible start point, as specific reference to the hierarchy does not appear in the stem or part (a) of the question. Explaining that effectiveness (and reliability) is greater for control measures at the top of the hierarchy compared to those near the bottom was also necessary. Simply stating the relative positions of PPE and LEV in the hierarchy was also worthy of marks. However, many candidates missed out these key points in their explanation.

Some candidates were able to explain why the effectiveness of PPE and LEV vary, as PPE only protects the individual using it and relies on many factors to achieve protection, including fit, face shape, time of use, etc. Whereas LEV protects all those working in the vicinity and if designed, installed and maintained correctly is always effective when it is switched on. Other marks were available for explaining that LEV minimises the spread of the hazardous substance and can remove it close to the source of emission.

Part (b) of this question required candidates to have knowledge of some of the other principles of good practice and many candidates were able to refer to at least one or two of these.

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- Question 6** Hazardous substances entering the body through the skin can cause *systemic* effects.
- (a) **Describe** the structure of the skin. (6)  
*Marks will **not** be awarded for diagrams. A description in words is required.*
- (b) **Explain** how a hazardous substance could enter the body through the skin and cause a *systemic* effect. (4)
- 

This question assessed candidates' knowledge and understanding of learning outcome 2.1: Explain the main routes of entry and the human body's defensive responses to hazardous substances.

It was reassuring to see that when answering part (a) of this question nearly all candidates followed the specific instruction and did not draw a diagram. The word descriptions provided were variable in the level of detail provided. Most candidates stated that the skin has three layers and were able to name the three layers. Some candidates described correctly the relative positions of these layers.

With six marks available for part (a) further detail was required to achieve full marks. This further detail was often missing or inaccurate. Marks were available for describing other features in the skin's structure, their position and function, eg sebaceous glands, sweat glands and hair follicles.

Candidates were able to explain that hazardous substances can enter the body via cuts and abrasions in the skin, as well as by injection. Many candidates also indicated absorption through intact skin was possible for some hazardous substances. An explanation of the systemic effect was not always given. Candidates sometimes explained how the hazardous substances can move around the body but omitted to mention that systemic effects are seen in other target organs with no local effect on the skin at the point of entry.

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- Question 7** A large indoor poultry farm is concerned about employees being exposed to the zoonose that causes the disease psittacosis (also known as ornithosis).
- (a) (i) **Give** the meaning of the term 'zoonose'. (1)  
(ii) **Identify BOTH** the type and name of the biological agent that causes psittacosis. (2)
- (b) **Explain** how the employees are likely to be exposed to the biological agent that causes psittacosis. (4)
- (c) **Identify** possible ill-health effects that could result from exposure to the biological agent that causes psittacosis. (3)
- (d) **Describe** control measures that could be put in place to help reduce the risk of employees contracting psittacosis. (10)
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This question assessed candidates' knowledge and understanding of learning outcomes 5.1: Explain the types and properties of biological agents found at work; and 5.2: Explain the assessment and control of risk from deliberate and non-deliberate exposure to biological agents at work.

To gain the one mark available in part (a) (i) candidates needed to state that a zoonose is an animal disease that might be transmitted to humans.



Part (a) (ii) did require some specific knowledge. The biological agent that causes psittacosis is the bacterium *Chlamydoiphila psittaci*.

In part (b) candidates needed to understand that the key point was dust or aerosols from urine or dried faeces present a risk if inhaled. Few candidates mentioned that other possible routes of exposure include bites from infected birds and even human-to-human transmission. Some candidates did not consider the routes of entry for the biological agent and instead indicated that exposure occurs when handling the birds. This is not sufficient for an explanation at diploma level.

Many candidates were able to mention 'flu-like symptoms', such as fever, headaches, chills, etc as an ill-health effect when answering part (c). However, few mentioned the other more specific symptoms associated with psittacosis. While there are no specific reference documents listed in the syllabus for zoonoses, the HSE website does provide suitable resources for tutors and candidates.

The range of control measures described in part (d) should have included ventilation and the use of RPE as well as the more common hygiene-related controls. Cleaning regimes are also important and these should avoid dry brushing and instead involve dampening down or vacuum cleaning techniques. Having understood that the main route of exposure was through inhalation when answering part (b), this should have informed the range of control measures in part (d).

Few candidates considered how control measures relating to the health of birds could also be relevant. Relevant control measures include minimising the stress of the flock, to reduce the shedding of the organism from the birds, as well as screening the flock and isolating infected birds.

This question was one of the least popular section B questions, selected by less than half of all candidates.

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**Question 8**

- (a) **Explain** when it might be necessary to use respiratory protective equipment (RPE) as a control measure to help reduce exposure to a hazardous substance. **(6)**

Employees carrying out a task involving the corrosive vapour of ammonia have been provided with RPE to protect them from exposure to ammonia by inhalation. The employer used the following information to determine the selection of the RPE:

Concentration of ammonia vapour in the workplace	280 ppm
Workplace exposure limit for ammonia is	35 ppm (15-min STEL)
Assigned protection factor for selected RPE	20

- (b) **Explain** how the employer can use this information to determine if the choice of RPE is appropriate. **(4)**
- (c) **Outline** what an employer should consider when selecting RPE for this particular task. **(10)**

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This question assessed candidates' knowledge and understanding of learning outcome 3.4: Explain the effectiveness of various types of personal protective equipment (PPE) and the factors to consider in selection of PPE.

This question focused specifically on respiratory protective equipment (RPE) as a type of PPE.

Answers to part (a) were limited, with many candidates unable to explain when it might be necessary to use RPE and limited their response to using RPE as a last resort. Instead, candidates should have based their response on the information in the HSE publication HSG53, *Respiratory protective equipment at work; A practical guide*. This is listed in the Unit B syllabus references. RPE is necessary for some short duration tasks, as an interim measure while other controls are being installed and to facilitate escape in an emergency.

Responses to part (b) suggested a lack of technical understanding. Candidates did not always appreciate that assigned protection factor is a ratio and as such has no units associated with it. Some candidates were able to carry out the simple calculation and determined the RPE was appropriate, but did not mention that the RPE selected also provided a good safety factor.

There was a wide range of possible content for part (c) and with 10 marks available a wide range of differing considerations was required. Some answers were limited.

This was a popular question in section B and was selected by two thirds of all candidates, however most candidates received low marks.

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**Question 9**

Forestry workers are required to wear personal protective equipment (PPE) to protect them from hazards associated with the machinery they use. This PPE includes eye and head protection, gloves and protective clothing.

The workers are outdoors and being exposed to high levels of ultra-violet (UV), non-ionising radiation from the sun. This situation can lead to heat-related illness and health effects from exposure to the sun.

- (a) **Explain** the importance of maintaining heat balance in the body. (4)
- (b) **Identify** possible effects of heat-related illness. (4)
- (c) **Outline** control measures to help reduce the risks from exposure to heat and non-ionising radiation hazards for the forestry workers. (12)

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This question assessed candidates' knowledge and understanding of learning outcomes 10.1: Explain the need for, and factors involved in, the provision and maintenance of temperature in both moderate and extreme thermal environments; 7.2: Explain the effects of exposure to non-ionising radiation, its measurement and control; and 7.1: Outline the nature of the different types of ionising and non-ionising radiation.

Responses to part (a) were too limited for a diploma level answer to the depth necessary for an 'explain' command word. It was not sufficient to simply indicate that heat balance is necessary for the body to function. With 4 marks available more detail was required. Many candidates had difficulty and perhaps gained one mark for indicating that if you get too hot or too cold this can eventually lead to death. Candidates were expected to understand that maintaining a constant temperature in the body is important as many chemical processes within the body rely on a specific temperature. Some deviations from this temperature can be addressed through body responses such as shivering or an increased blood flow to the extremities, but if not addressed a heat imbalance can result in a loss of concentration and dexterity and can increase the risk of accidents.

In part (b) answers were again limited. Candidates often did not identify a sufficient range of ill-health effects for the 4 marks available. Severe thirst and fainting were often not included in candidates' responses.

Most candidates gained the majority of their marks in part (c) of this question. Candidates needed to include control measures relevant to each of the hazards; the exposure to heat and the non-ionising radiation (UV). For example, use of sun cream and having sufficient supplies of drinking water were worthy of marks. Some control measures would help reduce the risks from both hazards. For example, providing shaded areas for rest breaks and avoiding work in the hottest part of the day. Other control measures awarding marks include, training in the effects of exposure to these hazards and how to reduce the risks, identifying those who may be susceptible and allowing time for acclimatisation to the working environment.

This question, which assessed understanding from two different elements of the syllabus, was answered by two thirds of all candidates and produced reasonable responses.

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- Question 10** An employee is using a hand-held jackhammer to break up a large area of concrete. Jackhammers produce high levels of noise and vibration.
- (a) **Outline** the possible ill-health effects to the employee from the prolonged use of jackhammers to break concrete. (5)
  - (b) **Outline** actions that the employee can take to help reduce the risks from their exposure to the noise and vibration of this work activity. (7)
  - (c) **Review** the similarities and differences between hand-arm vibration exposure assessment and noise exposure assessment. (8)
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This question assessed candidates' knowledge and understanding of learning outcomes 6.2: Explain the effects of noise on the individual and the use of audiometry; 6.3: Explain the measurement and assessment of noise exposure; 6.4: Explain the principles and methods of controlling noise and noise exposure; 6.6: Explain the effects of vibration on the individual; 6.7: Explain the measurement and assessment of vibration exposure; and 6.8: Explain the principles and methods of controlling vibration and vibration exposure.

Responses to part (a) were limited and candidates did not always address both noise and vibration ill-health effects equally, despite both hazards being stated in the stem of the question. Noise-induced hearing loss and circulatory disorders are possible ill-health effects. Few candidates also recognised that breaking concrete with jackhammers could result in exposure to silica dust, so silicosis is another possible ill-health effect from this work activity.

Candidates frequently misread part (b) and answered with actions the employer could take. The question asks what the *employee* can do and needed to take account of actions that reduce exposure to both noise and vibration. Some control measures are relevant to both, such as reducing the amount of time they are exposed. Other actions an employee can take are only relevant in relation to one of the hazards. For example, giving up smoking would help reduce the risks associated with exposure to the vibration hazard.

Wearing the appropriate PPE is relevant for both hazards, although the PPE is different. Marks were available for wearing hearing protection and wearing gloves to keep hands warm.

In part (c) candidates had difficulty in reviewing the similarities and differences. There were more differences that could gain marks but candidates were not penalised for emphasising these over any similarities. 'Review' is a diploma command word and means: *'to make a survey of; examine, look over carefully and give a critical account'*.

Answers to this part of the question suggested that some candidates were not able to think broadly and instead could only focus on one aspect of the syllabus at a time, ie how to assess noise or how to assess vibration. Candidates that had an understanding of the concepts of noise and vibration assessment were able to recognise that both involve consideration of magnitude, frequency and duration of exposure. Measurements of both noise and vibration exposure are typically carried out over a working shift and all sources of noise and vibration exposure must be considered.

The obvious differences between assessment of noise and vibration exposure arise because different units of measurement are used, the measuring devices are placed in different locations (ie near the ear or on the handle/wrist) etc. Noise assessment is based on sound pressure levels, whereas vibration is an acceleration measurement.

This question was answered by just over two thirds of all candidates.

**Question 11** In a chemical process employees are exposed to two organic liquids. Table 1 below shows the average personal exposure levels to each of the organic liquids for one employee measured over an 8-hour day.

**Table 1:**

Task undertaken by employee	Duration of task	Exposure to Liquid A (ppm)	Exposure to Liquid B (ppm)
Measuring out liquid	30 minutes	280	140
Adding liquid to the mixing vessel	1 hour	110	80
Supervision of mixing	2 hours	150	50
Transfer of mixture to containers	3 hours	150	50

Assume exposure is zero at all other times.

**Table 2:**

	Liquid A	Liquid B
8-hour time-weighted average exposure of the one employee	125 ppm	50 ppm

- (a) Using the information in Table 1, **demonstrate** that the 8-hour time-weighted average (TWA) exposures of the employee to **BOTH** Liquid A and Liquid B are as shown in Table 2. (8)

Your answer should include detailed working to show how the exposure is calculated.

The workplace exposure limits (WELs) for the two liquids are as follows:

**Table 3:**

Liquid	Workplace exposure limit	
	Long-term exposure limit (8-hour TWA limit reference period)	Short-term exposure limit (15-minute reference period)
A	200	250
B	200	300

- (b) **Outline** what actions the employer might need to take to control exposure to Liquid A, which is an essential component of the chemical process. (7)
- (c) **Comment** on the exposure to Liquid B. (1)
- (d) There is a concern that exposure to a mixture of these two liquids might increase the risk to employees. (4)
- Consider** why this *might* be a valid concern. (4)

This question assessed candidates' knowledge and understanding of learning outcomes 2.3: Outline the factors to consider when undertaking assessment and evaluation of risks from hazardous substances; and 4.1: Explain how workplace exposure limits are used in the workplace.

This was a popular question in section B and most candidates who answered this question achieved good marks for part (a). Occasionally, there was a small mathematical slip or inadequate answer that resulted in one or two of the eight marks being missed. As candidates were being asked to demonstrate that these 8-hour TWA exposures were as stated in table 2, there were no marks available for writing down the final answers, 125ppm and 50 ppm for liquid A and B respectively. The reason for taking this approach was to ensure that candidates who had made a slip or were unable to answer part (a) were not disadvantaged when answering part (b) that has an almost equal number of marks available.

Most candidates provided only limited responses to part (b). Comparing the information in table 2 and table 3 it was clear that neither the LTEL WEL nor the STEL WEL for liquid A has been exceeded **over the 8 hour time period**. Therefore, in brief, it would appear that no further action was required, other than to monitor the ongoing effectiveness of the existing control. However, many candidates restricted their answer to this conclusion that meant they did not achieve the 7 marks available.

Had candidates also referred back to the information in table 1 it would have been apparent that the STEL WEL of 250ppm for liquid A was exceeded during the measuring out of liquid A. This indicates other actions are required to control exposure in this part of the chemical process. Some candidates noted this and went on to outline a range of other actions relevant to that part of the process.

As the mark allocation suggests, there was little to include in part (c) other than to comment that exposure to liquid B was adequately controlled at all times in the chemical process.

Responses to part (d) were variable and some candidates did not appreciate the possible increased risk of a mixed exposure to both liquids A and B. Synergistic effects are referred to in EH40 and candidates should have considered that such an effect could occur in this chemical process. Marks were available for outlining that this synergistic effect means the risk of exposure to the mixture is greater than the sum of the risks from exposure to the individual liquids.

Fewer candidates considered the other possible interactions that could result. It could also be that the effects of exposure to liquids A and B were independent or additive.

## Examination technique

The following issues are consistently identified as the main areas in need of improvement for candidates undertaking Diploma level qualifications:

### Candidates misread/misinterpreted the question

NEBOSH questions are systematically and carefully prepared and are subject to a number of checks and balances prior to being authorised for use in question papers. These checks include ensuring that questions set for the Diploma level qualifications relate directly to the learning outcomes contained within the associated syllabus guides. The learning outcomes require candidates to be sufficiently prepared to provide the relevant depth of answer across a broad range of topic areas. For example, a candidate could be asked about the causes of stress, or could be asked about the effects of stress, a question could require a response relating to the principles of fire initiation, or a question could require a response relating to the spread of fire. Therefore, a candidate should focus not only on the general topic area (eg stress, fire), but also the specific aspect of that topic to which the question relates.

Examiners suggest that while many candidates do begin their answer satisfactorily and perhaps gain one or two marks, they then lose sight of the question and include irrelevant information. Although further points included in an answer can relate to the general topic area, these points are not focused on the specific learning outcome and marks cannot be awarded. However, some candidates appear to misread or misinterpret several questions. This situation is more likely due to candidates preparing for the examination with a number of stock answers obtained through rote-learning, that again can provide answers that are loosely associated with the topic matter but do not provide answers specific to the question. Such an approach is clearly evident to an Examiner and demonstrates little understanding of the topic matter and marks are not awarded.

Examiners noted a tendency on the part of many candidates to write about things that were not asked for, despite the fact that guidance as to what to cover had been given in the question. An example is a question where candidates were instructed that there was no need to make reference to specific control measures and yet did so. In another example candidates wrote about selection of PPE when the question wording had clearly stated that this had already been undertaken. Another example was where candidates wrote about barriers to rehabilitation without relating them to the bio-psychosocial model, even though the question specifically asked them to do this.

Some candidates wrote large amounts of text on a single topic where only one mark could be awarded. Candidates did not recognise that the amount of marks awarded to each section gives an indication of the depth of the answer required.

It would therefore appear that a sizeable number of candidates misread some of the questions, to their disadvantage. This should be a relatively easy pitfall to overcome; candidates should ensure that they make full use of the 10 minutes reading time to understand what each question requires. Candidates are advised to allow sufficient time to read and re-read the question in order to determine the key requirements. Underlining or highlighting key words can assist in keeping focused and simple mind maps or answer plans can also be useful. An answer plan will often be helpful in ensuring that all aspects of the question are attended to; maps and plans should be kept simple so as not to use up too much examination time; if all aspects are not dealt with it will be difficult to gain a high mark. Candidates should not assume when they see a question that it is exactly the same as one that they may have seen in the past; new questions are introduced and old questions are amended. It is therefore of the utmost importance that questions are read carefully and the instructions that they give are followed.

It may help if, when preparing for the examinations, candidates write out their answers in full and ask a tutor or other knowledgeable third party to mark their work. In so doing, issues with understanding can be noted and remedial action taken.

Course providers and candidates should note that various means are used to draw attention to keywords in examination questions. These means include emboldened and italicised text and the use of words in capitals. These means are intended to draw the candidate's attention to these words and this emphasis should then be acted upon when making a response. These devices can often assist in giving guidance on how to set out an answer to maximise the marks gained. For example: **Identify THREE** things to be considered **AND** for **EACH**.....

Candidates often have a reasonable body of knowledge and understanding on the topic covered by a question, but they have not been able to apply this to the examination question being asked. This could be because sufficient time has not been taken to read the question, noting the words being emphasised.

When preparing candidates for examination, or offering advice on examination technique, accredited course providers should stress that understanding the question requirements and the sub-structure of the response to the question is the fundamental step to providing a correct answer. Rather than learning the 'ideal answer' to certain questions effort would be better spent in guided analysis on what a question requires. The rote learning of answers appears to close the candidates' minds to the wider (and usually correct) possibilities.

### **Candidates repeated the same point but in different ways**

There are instances where candidates repeat very similar points in their answers, sometimes a number of times. This is easily done in the stressful environment of the examination. However, once a point has been successfully made and a mark awarded for it, that mark cannot be awarded again for similar points made later in the answer. In some cases, particularly where questions had more than one part, candidates gave an answer to, say, part (b) of a question in part (a), meaning that they needed to repeat themselves in part (b) thus wasting time.

One possible reason for this might be that candidates have relatively superficial knowledge of the topic - a view supported by the low marks evident in some answers. It appears that, faced with a certain number of marks to achieve and knowing that more needs to be written, but without detailed knowledge, candidates appear to opt to rephrase that which they have already written in the hope that it may gain further marks. Another possible reason is a failure to properly plan answers, especially to the Section B questions - it would appear that candidates sometimes become 'lost' in their answers, forgetting what has already been written. It may be due either to a lack of knowledge (so having no more to say) or to limited answer planning, or to a combination of the two. When a valid point has been made it will be credited, but repetition of that point will receive no further marks. Candidates may have left the examination room feeling that they had written plenty when in fact they had repeated themselves on multiple occasions, therefore gaining fewer marks than they assumed.

Candidates sometimes think they have written a lengthy answer to a question and are therefore deserving of a good proportion of the marks. Unfortunately, quantity is not necessarily an indicator of quality and sometimes candidates make the same point several times in different ways. Examiners are not able to award this same mark in the mark scheme a second time. The chance of repetition increases when all marks for a question (eg 10 or 20) are available in one block. It can also happen when a significant proportion of the marks are allocated to one part of a question.

This issue is most frequently demonstrated by candidates who did not impose a structure on their answers. Starting each new point on a new line would assist in preventing candidates from repeating a basic concept previously covered, as well as helping them assess whether they have covered enough information for the available marks.

As with the previous area for improvement ('misreading the question') writing an answer plan where points can be ticked off when made, or structuring an answer so that each point made is clearly shown, for example by underlining key points, can be of great use. This technique aids candidates and makes it much clearer in the stress of the examination for candidates to see which points have been made and reduce the chances of the same point being made several times. Course providers are encouraged to set written work and to provide feedback on written answers, looking to see that candidates are able to come up with a broad range of relevant and accurate points; they should point out to candidates where the same point is being made more than once.

Candidates are advised to read widely. This means reading beyond course notes in order to gain a fuller understanding of the topic being studied. In that way, candidates will know more and be able to produce a broader and more detailed answer in the examination. Candidates may also find it helpful to read through their answers as they write them in order to avoid repetition of points.

Course providers should provide examination technique pointers and practice as an integral part of the course exercises. Technique as much as knowledge uptake should be developed, particularly as many candidates may not have taken formal examinations for some years.



### **Candidates produced an incoherent answer**

Candidates produced answers that lacked structure, digressed from the question asked and were often incoherent as a result. In many cases, there seemed to be a scatter gun approach to assembling an answer, which made that answer difficult to follow. Answers that lack structure and logic are inevitably more difficult to follow than those that are well structured and follow a logical approach. Those candidates who prepare well for the unit examination and who therefore have a good and detailed knowledge commensurate with that expected at Diploma level, invariably supply structured, coherent answers that gain good marks; those candidates who are less well prepared tend not to do so.

Having good written communication skills and the ability to articulate ideas and concepts clearly and concisely are important aspects of the health and safety practitioner's wider competence. Candidates should be given as much opportunity as possible to practice their writing skills and are advised to practice writing out answers in full during the revision phase. This will enable them to develop their knowledge and to demonstrate it to better effect during the examination. It may help if candidates ask a person with no health and safety knowledge to review their answers and to see whether the reviewer can understand the points being made.

### **Candidates did not respond effectively to the command word**

A key indicator in an examination question will be the command word, which is always given in **bold** typeface. The command word will indicate the depth of answer that is expected by the candidate.

Generally, there has been an improvement in response to command words, but a number of candidates continue to produce answers that are little more than a list even when the command word requires a more detailed level of response, such as 'outline' or 'explain'. This is specifically addressed in the following section dealing with command words, most commonly failure to provide sufficient content to constitute an 'outline' was noted. Failure to respond to the relevant command word in context was also a frequent problem hence information inappropriate to the question was often given.

Course exercises should guide candidates to assessing the relevant points in any given scenario such that they are able to apply the relevant syllabus elements within the command word remit.

### **Candidate's handwriting was illegible**

It is unusual to have to comment on this aspect of candidate answers, as experienced Examiners rarely have difficulties when reading examination scripts. However, Examiners have independently identified and commented on this as an area of concern. While it is understood that candidates feel under pressure in an examination and are unlikely to produce examination scripts in a handwriting style that is representative of their usual written standards; it is still necessary for candidates to produce a script that gives them the best chance of gaining marks. This means that the Examiners must be able to read all the written content.

Some simple things may help to overcome handwriting issues. Using answer planning and thinking time, writing double-line spaced, writing in larger text size than usual, using a suitable type of pen, perhaps trying out some different types of pens, prior to the examination. In addition, it is important to practise hand writing answers in the allocated time, as part of the examination preparation and revision. Today, few of us hand-write for extended periods of time on a regular basis, as electronic communication and keyboard skills are so widely used. Accredited course providers should encourage and give opportunities for candidates to practise this hand-writing skill throughout their course of study. They should identify at an early stage if inherent problems exist. These can sometimes be accommodated through reasonable adjustments, eg by the provision of a scribe or the use of a keyboard. Candidates with poorly legible handwriting need to understand this constraint early in their course of studies in order for them to minimise the effect this may have.

NEBOSH recommends to accredited course providers that candidates undertaking this qualification should reach a minimum standard of English equivalent to an International English Language Testing System score of 7.0 or higher in IELTS tests in order to be accepted onto a Diploma level programme.

For further information please see the latest version of the IELTS Handbook or consult the IELTS website: <https://www.ielts.org/about-the-test/test-format>

Candidates wishing to assess their own language expertise may consult the IELTS website for information on taking the test: <http://www.ielts.org>

Course providers are reminded that they must ensure that these standards are satisfied or additional tuition provided to ensure accessible and inclusive lifelong learning.

### **Candidates did not answer all the questions**

It has been noted that a number of candidates do not attempt all of the questions on the examination and of course where a candidate does not provide an answer to a question, no marks can be awarded. Missing out whole questions immediately reduces the number of possible marks that can be gained and so immediately reduces the candidate's opportunity for success. There can be several reasons for this issue: running out of the allocated time for the examination, a lack of sufficient knowledge necessary to address parts of some questions, or in other cases, some candidates have a total lack of awareness that the topic covered in certain questions is even in the syllabus.

If candidates have not fully studied the breadth of the syllabus they may find they are not then equipped to address some of the questions that are on a question paper. At that late stage there is little a candidate can do to address this point. Responsibility for delivering and studying the full breadth of the syllabus rests with both the course provider and the individual candidates and both must play their part to ensure candidates arrive at the examination with a range of knowledge across all areas of the syllabus.

### **Lack of technical knowledge required at Diploma level**

In Section A, candidates must attempt all questions and it was clear that some struggled with those requiring more detailed and technical knowledge. For example, it is not acceptable that at Diploma level, candidates have no knowledge of the principles of good practice that underpin COSHH. Unfortunately this was often found to be the case in responses to questions.

In Section B, where candidates have a choice of questions, many sought to avoid those questions with a higher technical knowledge content. For example questions on radiation, lighting and vibration. Practitioners operating at Diploma level need to be confident with the technical content of the whole syllabus and this does require a significant amount of private study, particularly in these areas of the syllabus that are perhaps less familiar to them in their own workplace situations.

### **Candidates provided rote-learned responses that did not fit the question**

It was apparent in those questions that were similar to those previously set, that the candidates' thought processes were constrained by attachment to memorised answer schemes that addressed different question demands.

While knowledge of material forms a part of the study for a Diploma-level qualification, a key aspect being assessed is a candidate's **understanding** of the topic and reciting a pre-prepared and memorised answer will not show a candidate's understanding. In fact, if a candidate gives a memorised answer to a question that may look similar, but actually is asking for a different aspect of a topic in the syllabus, it shows a lack of understanding of the topic and will inevitably result in low marks being awarded for that answer.

## Command words

Please note that the examples used here are for the purpose of explanation only.

The following command words are listed in the order identified as being the most challenging for candidates:

### Explain

*Explain: To provide an understanding. To make an idea or relationship clear.*

This command word requires a demonstration of an understanding of the subject matter covered by the question. Superficial answers are frequently given, whereas this command word demands greater detail. For example, candidates are occasionally able to outline a legal breach but do not always explain why it had been breached. A number of instances of candidates simply providing a list of information suggests that while candidates probably have the correct understanding, they cannot properly express it. Whether this is a reflection of the candidate's language abilities, in clearly constructing a written explanation, or if it is an outcome of a limited understanding or recollection of their teaching, is unclear. It may be linked to a general societal decline in the ability to express clearly explained concepts in the written word, but this remains a skill that health and safety professionals are frequently required to demonstrate.

When responding to an 'explain' command word it is helpful to present the response as a logical sequence of steps. Candidates must also be guided by the number of marks available. When asked to 'explain the purposes of a thorough examination and test of a local exhaust ventilation system' for 5 marks, this should indicate a degree of detail is required and there may be several parts to the explanation.

Candidates are often unable to explain their answers in sufficient detail or appear to become confused about what they want to say as they write their answer. For example, in one question many candidates explained the difference between the types of sign, explaining colours and shapes of signs without explaining how they could be used in the depot, as required by the question.

### Describe

*Describe: To give a detailed written account of the distinctive features of a subject. The account should be factual without any attempt to explain.*

The command word 'describe' clearly requires a description of something. The NEBOSH guidance on command words says that 'describe' requires a detailed written account of the distinctive features of a subject such that another person would be able to visualise what was being described. Candidates have a tendency to confuse 'describe' with 'outline'. This means that less detailed answers are given that inevitably lead to lower marks. This may indicate a significant lack of detailed knowledge and/or a lack of ability to articulate the course concepts clearly. Candidates should aim to achieve a level of understanding that enables them to describe key concepts.

Some candidates see the command word 'describe' as an opportunity to fill out an answer with irrelevant detail. If a person was asked to describe the chair they were sitting on, they would have little difficulty in doing so and would not give general unconnected information about chairs in general, fill a page with everything they know about chairs or explain why they were sitting on the chair. Candidates should consider the general use of the command word when providing examination answers.

### Outline

*Outline: To indicate the principal features or different parts of.*

This is probably the most common command word but most candidates treat it like 'identify' and provide little more than a bullet pointed list. As the NEBOSH guidance on command words makes clear, 'outline' is not the same as 'identify' so candidates will be expected to give more detail in their answers. 'Outline' requires a candidate to indicate *'the principal features or different parts of'* the subject of the question.

An outline is more than a simple list, but does not require an exhaustive description. Instead, the outline requires a brief summary of the major aspects of whatever is stated in the question. 'Outline' questions

usually require a range of features or points to be included and often 'outline' responses can lack sufficient breadth, so candidates should also be guided by the number of marks available. Those candidates who gain better marks in questions featuring this command word give brief summaries to indicate the principal features or different parts of whatever was being questioned. If a question asks for an outline of the precautions when maintaining an item of work equipment, reference to isolation, safe access and personal protective equipment would not be sufficient on their own to gain the marks available. A suitable outline would include the meaning of isolation, how to achieve safe access and the types of protective clothing required.

## **Identify**

*Identify: To give a reference to an item, which could be its name or title.*

Candidates responding to identify questions usually provide a sufficient answer. Examiners will use the command word 'identify' when they require a brief response and in most cases, one or two words will be sufficient and further detail will not be required to gain the marks. If a question asks '**identify** typical symptoms of visual fatigue', then a response of 'eye irritation' is sufficient to gain 1 mark. If having been asked to identify something and further detail is needed, then a second command word may be used in the question.

However, in contrast to 'outline' answers being too brief, many candidates feel obliged to expand 'identify' answers into too much detail, with the possible perception that more words equals more marks. This is not the case and course providers should use the NEBOSH guidance on command words within their examination preparation sessions in order to prepare candidates for the command words that may arise.

## **Give**

*Give: To provide short, factual answers.*

'Give' is usually in a question together with a further requirement, such as '**give** the meaning of' or '**give** an example in **EACH** case'. Candidates tend to answer such questions satisfactorily, especially where a question might ask to 'identify' something and then 'give' an example. The candidate who can answer the first part, invariably has little difficulty in giving the example.

## **Comment**

*Comment: To give opinions (with justification) on an issue or statement by considering the issues relevant to it.*

For example, if candidates have already calculated two levels of the exposure to wood dust and are then asked to comment on this the issues would include the levels of exposure they had found, and candidates would need to give their opinion on these, while considering what is relevant. The question guides on what may be relevant for example, did it meet the legal requirements, did it suggest controls were adequate, so based on that guidance, did exposure need to be reduced further or did anything else need to be measured or considered? If candidates comment with justification on each of these areas they would gain good marks in that part of question.

Few candidates are able to respond appropriately to this command word. At Diploma level, candidates should be able to give a clear, reasoned opinion based on fact.

For additional guidance, please see NEBOSH's '*Guidance on command words used in learning outcomes and question papers*' document, which is available on our website: [www.nebosh.org.uk/students/default.asp?cref=1345&ct=2](http://www.nebosh.org.uk/students/default.asp?cref=1345&ct=2).