Examiners' Report

NEBOSH NATIONAL DIPLOMA IN OCCUPATIONAL HEALTH AND SAFETY

UNIT B:
HAZARDOUS AGENTS IN THE WORKPLACE

JULY 2019

CONTENTS

tel: 0116 263 4700 fax: 0116 282 4000 email: info@nebosh.org.uk website: www.nebosh.org.uk

Introduction

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 learners annually and are offered by over 600 Learning Partners, 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 learners and Learning Partners 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.

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

General comments

Many learners 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 learners, 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 2019.

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

Learners and Learning Partners 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.

Unit B
Hazardous agents in the workplace

Question 1 **Outline** how an occupational hygienist should determine an employee's long term personal exposure to *total inhalable* hazardous dust. **(10)**

This question assessed learners' knowledge and understanding of learning outcome 4.2: Outline the methods for sampling of airborne contaminants.

Many learners appeared to be unfamiliar with the syllabus requirements in learning outcome 4.2; in particular the general equipment and methodology for *personal* sampling of solid particulates including inhalable dusts. Instead, learners outlined general strategies for monitoring exposure to hazardous substances, or discussed health surveillance, control measures and use of respiratory protective equipment.

The method for determining an employee's long term personal exposure to inhalable dust is set out in the HSE document MDHS 14-4. However, learners did not need to know this specific document reference to gain full marks on this question. Instead, they were expected to outline the gravimetric method required. This involves the use of a filter (weighed before and after sampling), a sample head, connected to a pump with a calibrated flow rate. Marks were also available for outlining where to place the sample head and how to calculate the result in mg/m^3.

Question 2

(a) **Explain** how exposure to silica dust can cause silicosis. **(4)**

(b) The construction of a city's underground rail line involves extensive tunnelling and concrete spraying activities.

Outline controls that reduce the risk of employees developing silicosis, while carrying out tunnelling and concrete spraying activities. **(6)**

This question assessed learners' knowledge and understanding of learning outcomes 3.1: Explain the principles of prevention and control of exposure to hazardous substances (including carcinogens and mutagens); 2.2: Explain the identification, classification and health effects of hazardous substances used in the workplace; and 2.1: Explain the main routes of entry and the human body's defensive responses to hazardous substances.

Silica is one of the listed hazardous substances in learning outcome 2.2 and many learners were familiar with how silicosis occurs and were able to outline a good range of control measures.

In part (a) some learners answered the question by explaining the body's defence mechanisms that may be activated when silica dust is inhaled. This did not answer the question. Instead, it was necessary to explain how, once inhaled, the silica dust can be trapped in the alveoli and the resultant scarring, or hardening of lung tissue, affects the function of the lungs making breathing difficult. Very few learners indicated that the symptoms of silicosis can worsen even if exposure ceases.

The scenario given in the question, tunnelling and concrete spraying, may not have been familiar to some learners, but nevertheless many were able to outline a good range of controls to reduce the risk of employees developing silicosis in part (b). These included minimising the time employees spent in the area, and also restricting the number of people working in the area. Other controls included the use of ventilation, the provision of respiratory protective equipment, which would require face-fit testing, and training on the hazards and controls measures for silica dust. Reference to health surveillance was often too vague and instead learners were expected to outline the use of lung function tests (spirometry) as part of the package of control measures that reduce the risk of employees developing silicosis.

Some learners outlined control measures specifically relevant to this scenario, including the use of de-dusting equipment or extraction on the tunnelling machines, or the use of a concrete with lower silica content. However, it was not necessary to include these more specific controls in order to gain full marks in part (b).

Question 3 Dilution ventilation can be used to control certain types of hazardous substances generated in a workplace.

(a) **Outline** circumstances when dilution ventilation may be appropriate as a control measure to reduce exposure to a hazardous substance. **(3)**

(b) **Describe** the design features of the *air input* for a dilution ventilation system. **(3)**

For a dilution ventilation system to be effective the number of air changes achieved must be sufficient.

(c) (i) **Calculate** the number of air changes per hour for a dilution ventilation system with the following specification:

Workplace dimensions (metres):	10m x 10m x 3m
Volume of air throughput each hour:	3000m^3
Required number of air changes per hour:	10 to 15

(2)

(ii) **Comment** on the effectiveness of the specified dilution ventilation system in controlling exposure to a hazardous substance. **(2)**

This question assessed learners' knowledge and understanding of learning outcome 3.3: Explain the uses and limitations of dilution ventilation and the purpose and operation of local exhaust ventilation, including assessing and maintaining effectiveness.

Many learners gave very brief answers in part (a) often limited to just one circumstance, that dilution was appropriate for fumes, vapour or gas and not for dust. There is a wider range of circumstances that could have been considered. Dilution ventilation is appropriate when the hazardous substance has low toxicity or when it is generated at a steady rate. Learners and Learning Partners are reminded that in learning outcome 3.3 the syllabus includes 'the uses and limitations of dilution ventilation for hazardous substances'.

In part (b) a number of learners described all the components of a local exhaust ventilation system, instead of describing specifically the air input features of a dilution ventilation system. The italicisation of the words *air input* in the question indicates to learners that this is what they should address when answering this part of the question.

While fans can be a feature of an air input part of dilution ventilation, there are other ways in which air input can occur, for example through windows, doors or vents. The position or number of air inputs should be arranged so as to avoid 'dead spots'.

Most learners were able to correctly calculate the number of air changes per hour from the data provided in part (c) of the question. However, answers to part (d) were then often limited to one line, simply stating that 10 air changes per hour is within the required specification.

The command word 'comment' is to give opinions (with justification) on an issue or statement by considering the issues relevant to it. At Diploma-level, learners should be able to give a clear, reasoned opinion based on fact. To gain the two marks available it was necessary to justify the comment further, perhaps by indicating this was at the lower end of the specification range and better control could be achieved by increasing the number of air changes closer to the upper end of the specification range (15 air changes per hour). Another relevant comment could have justified that not all areas of the workplace may achieve the minimum of 10 air changes per hour that was calculated.

Question 4 Employees are required to pick up small pasta pieces from a delivery conveyor and transfer them to foil trays on a separate conveyor during the production of pre-prepared pasta dishes. This work is carried out standing in front of the conveyors for an 8-hour shift. An ergonomic risk assessment is to be carried out.

(a) **Outline** the ergonomic risk factors to be considered in this assessment. **(5)**

(b) A number of employees have complained about pains in their arms, shoulders and back.

Other than automation **outline** control measures that could help reduce the ergonomic risks these employees are exposed to. **(5)**

This question assessed learners' knowledge and understanding of learning outcomes 9.1: Outline types, causes and relevant workplace examples of injuries and ill-health conditions associated with repetitive physical activities, manual handling and poor posture; and 9.2: Explain the assessment and control of risks from repetitive activities, manual handling and poor posture.

Most learners achieved good marks on this question. Part (a) required an outline of the ergonomic risk factors, that include the repetitive nature of the task; the adoption of static postures for prolonged periods of time; and also environmental factors such as cold or hot temperatures that may be necessary in a food production environment. It was necessary for learners to provide an outline of these risk factors and not simply state the name of the risk factor, in order to fully gain the marks available. Some learners mistakenly approached this question using TILE (task, individual, load, environment) and this was not appropriate.

Control measures relevant in part (b) include a number of options to change the conveyor system, for example changing the speed which affects the work rate, repositioning the conveyor so employees could work from both sides and prevent over-reaching, or perhaps positioning the conveyors in parallel to reduce the need for twisting. Control measures that help manage postural issues would also be appropriate, for example providing seating, encouraging employees to change posture regularly and perhaps carrying out regular stretching exercises to relieve postural tension.

Question 5 The use of hand-held power tools results in employees being exposed to hand-arm vibration (HAV).

Outline what should be considered when conducting a risk assessment for exposure to HAV. **(10)**

This question assessed learners' knowledge and understanding of learning outcome 6.7: Explain the measurement and assessment of vibration exposure.

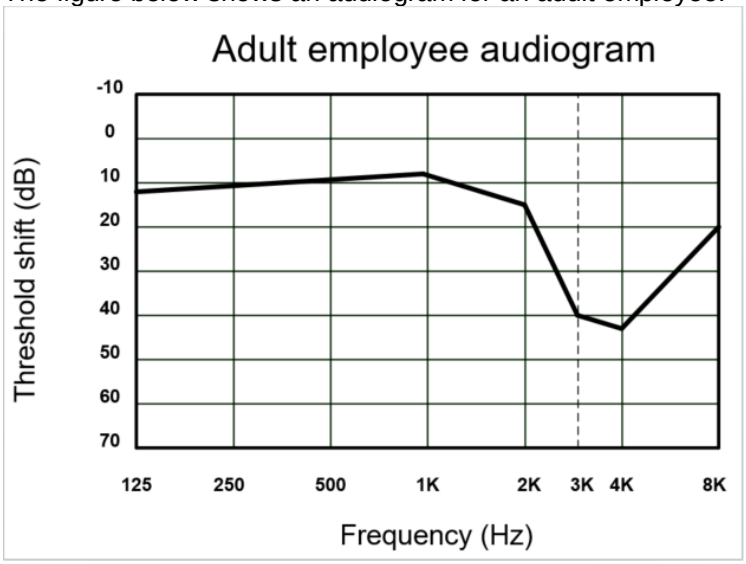
Many learners did not answer the question asked and instead wrote lengthy answers outlining the control measures that could be used to minimise exposure to HAV. The question clearly asks for what should be considered when conducting a risk assessment and while it is necessary to consider what existing control measures are in place, this is only one small part of all the considerations that are relevant in a risk assessment.

Learners should have considered the magnitude of the vibration that may have been measured or read from manufacturers' information. Duration and frequency of exposure to HAV should also be considered. These, together with the magnitude of vibration, give an indication of the dose employees are exposed to and this in turn should be considered in relation to exposure limit values and action values. Other considerations such as the temperature of the working environment and the age and condition of the power tools are also relevant considerations.

Question 6 Audiometry can be used to assess an employee's hearing.

(a) **Explain** what is meant by the term *'threshold shift'*. **(2)**

(b) The figure below shows an audiogram for an adult employee.



(i) **Give** the name of the hearing condition indicated in this audiogram. **(1)**

(ii) **Describe** the physical changes in the inner ear for an adult employee with this audiogram result. **(2)**

(iii) **Outline** the resultant effect on hearing for an adult employee with this audiogram result. **(1)**

(iv) **Outline** reasons why audiometry testing may not produce an accurate representation of the effects of workplace noise exposure on an employee's hearing. **(4)**

This question assessed learners' knowledge and understanding of learning outcome 6.2: Explain the effects of noise on the individual and the use of audiometry.

Many learners demonstrated limited understanding of audiometry, an important technique for measuring and monitoring the possible effects of workplace noise exposure on an employee's hearing.

'Threshold shift' is the term given to the reduction in hearing of an individual when compared to a young adult with healthy ears. Many learners gained one of the two marks available in part (a) as they did not refer to the comparison to the young adult with healthy ears.

Some learners correctly identified the hearing condition shown in the audiogram, noise-induced hearing loss. Others gave a wide range of other possible hearing conditions and did not achieve the one mark available in part (b) (i).

The changes in the inner ear, for someone with noise-induced hearing loss, were to be described in part (b) (ii). Some learners gave too brief a response to achieve the two marks available. Those learners who described the damage occurring in the cochlea where the hair cells are flattened or broken off did achieve full marks in this part of the question.

Someone with noise-induced hearing loss would not hear consonants clearly and would only hear vowels. In part (b) (iii) some learners briefly stated that 'hearing conversation would be difficult' which did not achieve the one mark available.

Most learners gained the majority of their marks for this question in part (b) (iv). Audiometry may not produce an accurate representation of the effects of workplace noise exposure because there may be background noise or distraction during the test, or the operator may not be competent to conduct the test. The test subject could be tired and not concentrating, particularly if they have been in a noisy environment just prior to the test. The test result shows all hearing loss, which may or may not be due to occupational exposure.

Question 7

The avian influenza virus can be found in chickens, ducks, geese, and wild birds. Poultry workers are at risk of becoming infected with this virus.

(a) **Outline** how poultry workers can become infected by this virus. **(4)**

(b) **Identify** the symptoms of avian influenza if contracted by poultry workers. **(4)**

A large poultry farm has a number of different locations where live birds are kept. Vehicles transporting new stock birds and bird food access each location and poultry workers move equipment between the locations daily. Vets and external agencies frequently visit all the locations.

(c) **Outline** control measures the poultry farm could use to minimise the risk of the virus entering their locations or spreading between the different locations. **(12)**

This question assessed learners' knowledge and understanding of learning outcomes 5.1: Explain the types and properties of biological agents found at work; and 1.1: Outline the nature of occupational health.

Part (a) required an outline of how poultry workers could become infected with the avian flu virus and therefore it is necessary to recognise that for this to happen the birds themselves need to be infected with the virus. Therefore, learners needed to refer to infected, diseased or unwell birds in their answer. Without this reference it was not clear that learners appreciated how the risks of infection arose. Where birds are already infected, poultry workers could become infected by contact with droppings, bedding or body secretions, etc from the infected birds.

Most learners were able to identify a range of symptoms of avian influenza and achieved a majority of the four marks available in part (b). There is a wide range of possible symptoms including fever or high temperature, a cough or shortness of breath, aching muscles or headaches, etc.

The detailed description of the nature of the work that is provided in the stem before part (c) illustrates there are lots of movements of birds, food, equipment and people; in, out and between the different locations. This description was intended to guide learners into thinking about issues of biosecurity and how, if the avian flu virus was present at one location, controls could be used to minimise the risk at other locations. Some learners did understand this and included in their answer controls that were used *both* on entry and exit from the various locations. Applying these controls only on entry or only on exit would not properly control the risk of spreading avian flu from one location to another.

These entry and exit controls include the cleaning or disinfecting of equipment and vehicles as well as personal protective equipment that would not be single use, eg boots.

Checks and controls on the buying of birds from reputable disease-free suppliers and the quarantine of newly arrived birds are also relevant control measures. Few learners recognised the importance of preventing wild birds access into the poultry areas, as they could be a source of the virus. Good pest control measures are also important.

Question 8

(a) **Identify** signs that would indicate a worker may be suffering from mental ill-health. **(4)**

Evidence recently published indicates that male construction workers are three times more likely to commit suicide than an average working male.

(b) **Outline** what might contribute to increased mental ill-health issues in construction workers. **(8)**

(c) **Outline** actions a construction company could take to actively improve the mental health and well-being of their construction workers. **(8)**

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

Part (a) was well answered by most learners with many identifying more than four signs of a worker suffering from mental ill-health, including decreased productivity, inability to concentrate and isolating themselves from their peers.

Parts (b) and (c) were specifically focused on the construction industry and some learners did not pay attention to this and gave very general answers not always achieving the marks available.

There is a wide range of things that might contribute to mental ill-health in a construction environment and those that may be particularly relevant are long and sometimes unpredictable hours, often spent working away from home, perhaps in basic or shared accommodation. Incomes can be unstable, as contract work can mean uncertainty over employment. An itinerant workforce means it can be difficult to form good working relationships.

Part (c) asks for an outline of what a construction company might do to improve mental health and well-being. It does not ask what individual workers can do. Having policies and procedures to prevent or minimise work-related stress and support a work-life balance are relevant. Proactive actions such as promoting mental health campaigns and reducing the stigma of mental ill-health are important. Appointing mental health champions and mental health first-aiders can help. More reactive actions include having in place specific plans to assist individual workers with existing mental health issues and supporting them to return to or stay in work.

Question 9 Lasers are often used by the entertainment industry during displays and music concerts attended by members of the public. The lasers used are of very high power and are given a hazard classification.

(a) **Outline** the hazard classification system used for lasers. **(4)**

(b) **Outline** how exposure to lasers can cause damage to the *eyes*. **(6)**

(c) **Outline** control measures that could be used to reduce the risks to the public at such displays. **(10)**

This question assessed learners' 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.

Part (a) of the question was answered well by most learners. The outlines indicated that laser classification was in classes 1 to 4, with 1 being the lowest power, and therefore least hazardous and 4 being the most powerful and most hazardous. Some learners provided further detail by referring to either the BS EN or IEC system of classification, that have 7 or 8 sub classes respectively. Some learners listed the sub classes correctly.

Answers to part (b) were generally limited and lacked the amount of information required to be awarded all of the six marks available. Many answers simply stated that lasers burn the retina and while this is worthy of marks it is not an outline of *how* exposure to lasers can damage the eye. Further marks were available for outlining that the light enters the eye and blinking response is not quick enough to protect the eye. The light becomes focused in the back of the eye (retina) and causes a heating effect. The severity of any injury from exposure to the laser light depends on a number of features including wavelength, duration and angle of exposure.

Responses to part (c) were mixed. Many learners outlined control measures such as protective housing for the lasers, controlled by interlock systems; use by only competent or trained operators and the need to prevent unauthorised access to hazardous areas. However, few learners referred to more technical measures such as using lasers that are within the maximum permissible exposures (MPE) set down in standards and making on-site measurements to confirm the MPE is complied with.

Question 10

(a) **Identify FOUR** *environmental* parameters that affect thermal comfort. **(4)**

(b) **Identify THREE** *other* parameters that affect thermal comfort. **(3)**

(c) Employees are at risk of heat stress when working in a manufacturing process that produces high levels of heat and steam. Some employees are more vulnerable to the effects of heat stress.

(i) **Identify TWO** reasons why some employees may be more vulnerable to heat stress. **(2)**

(ii) **Outline** controls measures that help reduce the risk of heat stress for *all* employees working in this manufacturing process. **(8)**

(d) Wet bulb globe temperature (WBGT) is a commonly used heat stress index.

Outline the purpose of WBGT. **(3)**

This question assessed learners' knowledge and understanding of learning outcome 10.1: Explain the need for, and factors involved in, the provision and maintenance of temperature in both moderate and extreme thermal environments.

Answers to part (a) were often imprecise. Learners need to identify the four environmental parameters as they are listed in the Diploma syllabus in learning outcome 10.1 which states 'the environmental parameters affecting thermal comfort: air temperature, radiant temperature, relative humidity, air velocity'.

Similarly in response to part (b) three other parameters are any of those listed in the Diploma syllabus: metabolic rate, clothing, sweat rate, duration of exposure. In addition, activity or work rate are also relevant.

In part (c) (i) age, weight, gender and medical conditions are all reasons why some employees may be more vulnerable to heat stress. Few learners identified the level of hydration or that alcohol intake could also be a reason.

Part (c) (ii) is where most learners achieved the majority of their marks on this question. There is a wide range of possible controls measures for the situation described in the question. Those control measures that were often missed by learners included having an adequate number of employees, so the work rate or physical activity levels do not significantly increase the risk of heat stress. Also omitted as control measures was the need for acclimatisation of individuals to the work environment and both pre-employment screening to identify vulnerable individuals and the ongoing health surveillance of individuals working in this environment.

Answers to part (d) were limited with many learners unable to outline the purpose of the heat stress index, WBGT. Many responded to the question by writing down the equation from which WBGT can be calculated, but this was not required. The purpose of a heat stress index, such as WBGT, is that it provides a single number representation of the severity of a thermal environment, which can then be compared to standards and can be helpful when risk assessing a thermal environment.

Question 11 Provision of *sufficient* lighting levels is necessary in all workplaces and these levels of illuminance can be measured.

(a) **Identify** the unit of measurement typically used for illuminance. **(1)**

(b) **Outline** what could affect levels of illuminance measured in a workplace. **(10)**

In addition to sufficient lighting, a workplace should have lighting that is *suitable* for the work being carried out.

(c) **Explain** *other* key features of the lighting design that should be considered when providing *suitable* lighting for an:

(i) operating theatre in a hospital; **(5)**

(ii) outdoor loading bay. **(4)**

This question assessed learners' knowledge and understanding of learning outcome 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.

In part (a) the majority of learners correctly identified Lux.

Part (b) had ten marks available and many learners did not include a sufficiently wide range of points in their answer. The most obvious things that affect the level of illuminance are the number of lights and room dimensions, the amount of natural light and the time of day or year when the levels of illuminance are measured. Other points that were often overlooked by learners were the design of the lighting, for example did the lights have diffusers and the amount of different types of lighting, for example local lighting or general lighting.

Whereas the first half of this question considered the sufficiency of lighting the second half considered the suitability of the lighting required in different types of workplace. Application of this knowledge to 'real-world' scenarios was necessary in this part of the question. For (c) (i) the scenario of a hospital operating theatre is specifically referred to in the syllabus as a place where emergency lighting is critical. Many learners did not refer to this in the answer. The emergency lighting required in this type of situation needs to be more than just escape lighting, it needs to be standby lighting that will last for a sufficient period of time. The emergency lighting would need to be at full capacity immediately when it comes into use. Some learners did explain other features of lighting relevant to this scenario, including the use of head lamps by surgeons and the need for the light fitting to be sealed and easily cleaned for infection-control reasons.

The other scenario in part (c) (ii), an outdoor loading bay, has very differing requirements. Lighting in the situation needs to be uniform across a wide area, avoiding shadows and glare that may distract drivers or pedestrians. This lighting may need to be activated by light sensors. Local planning requirements may also need to be complied with, especially where large high-level floodlights are installed.

Examination technique

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

Learners 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 learners to be sufficiently prepared to provide the relevant depth of answer across a broad range of topic areas. For example, a learner 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 learner 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 learners 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 learners appear to misread or misinterpret several questions. This situation is more likely due to learners 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 learners 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 learners were instructed that there was no need to make reference to specific control measures and yet did so. In another example learners wrote about selection of PPE when the question wording had clearly stated that this had already been undertaken. Another example was where learners wrote about barriers to rehabilitation without relating them to the bio-psychosocial model, even though the question specifically asked them to do this.

Some learners wrote large amounts of text on a single topic where only one mark could be awarded. Learners 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 learners misread some of the questions, to their disadvantage. This should be a relatively easy pitfall to overcome; learners should ensure that they make full use of the 10 minutes reading time to understand what each question requires. Learners 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. Learners 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, learners 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.

Learning Partners and learners 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 learner'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**…..

Learners 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 learners for examination, or offering advice on examination technique, Learning Partners 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 learners' minds to the wider (and usually correct) possibilities.

Learners repeated the same point but in different ways

There are instances where learners 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, learners 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 learners 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, learners 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 learners 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. Learners 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.

Learners 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 learners 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 learners who did not impose a structure on their answers. Starting each new point on a new line would assist in preventing learners 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 learners and makes it much clearer in the stress of the examination for learners to see which points have been made and reduce the chances of the same point being made several times. Learning Partners are encouraged to set written work and to provide feedback on written answers, looking to see that learners are able to come up with a broad range of relevant and accurate points; they should point out to learners where the same point is being made more than once.

Learners 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, learners will know more and be able to produce a broader and more detailed answer in the examination. Learners may also find it helpful to read through their answers as they write them in order to avoid repetition of points.

Learning Partners 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 learners may not have taken formal examinations for some years.

Learners produced an incoherent answer

Learners 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 learners 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 learners 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. Learners 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 learners 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.

Learners 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 learner.

Generally, there has been an improvement in response to command words, but a number of learners 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 learners 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.

Learner's handwriting was illegible

It is unusual to have to comment on this aspect of learner 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 learners 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 learners 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. Learning Partners should encourage and give opportunities for learners 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. Learners with limitedly 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 Learning Partners that learners 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

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

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

Learners did not answer all the questions

It has been noted that a number of learners do not attempt all of the questions on the examination and of course where a learner 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 learner'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 learners have a total lack of awareness that the topic covered in certain questions is even in the syllabus.

If learners 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 learner can do to address this point. Responsibility for delivering and studying the full breadth of the syllabus rests with both the Learning Partner and the individual learners and both must play their part to ensure learners 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, learners 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, learners 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 learners 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.

Learners 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 learners' 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 learner's **understanding** of the topic and reciting a pre-prepared and memorised answer will not show a learner's understanding. In fact, if a learner 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 learners:

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, learners are occasionally able to outline a legal breach but do not always explain why it had been breached. A number of instances of learners simply providing a list of information suggests that while learners probably have the correct understanding, they cannot properly express it. Whether this is a reflection of the learner'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. Learners 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.

Learners 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 learners 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. Learners 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. Learners should aim to achieve a level of understanding that enables them to describe key concepts.

Some learners 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. Learners 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 learners 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 learners will be expected to give more detail in their answers. 'Outline' requires a learner 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 learners should also be guided by the number of marks available. Those learners 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.

Learners 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 learners 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 Learning Partners should use the NEBOSH guidance on command words within their examination preparation sessions in order to prepare learners 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'. Learners tend to answer such questions satisfactorily, especially where a question might ask to 'identify' something and then 'give' an example. The learner 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 learners 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 learners 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 learners comment with justification on each of these areas they would gain good marks in that part of question.

Few learners are able to respond appropriately to this command word. At Diploma level, learners 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: https://www.nebosh.org.uk/i-am/a-learner/ - from this page the document can be found by clicking on the relevant Qualification link, then on the 'Resources' tab.