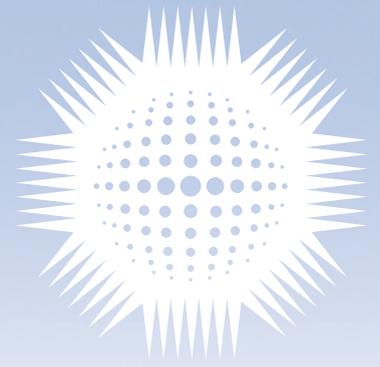


January 2017

Examiners' Report

NEBOSH International Diploma in Occupational Health and Safety (Unit B)



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NEBOSH INTERNATIONAL DIPLOMA IN OCCUPATIONAL HEALTH AND SAFETY

UNIT IB: INTERNATIONAL CONTROL OF HAZARDOUS AGENTS IN THE WORKPLACE

JANUARY 2017



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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 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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General comments

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 January 2017. This report covers both 2011 and 2015 specifications.

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 International 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 IB 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 IB 'Example question paper and Examiners' feedback on expected answers' which provides example questions and details Examiners' expectations and typical areas of underperformance.

Unit IB

International control of hazardous agents in the workplace

Question 1 *Workers in a chemical plant are provided with gloves to protect against the possible effects of the chemicals. In recent months, there has been an increase in the number of hand and lower arm skin complaints among the workers.*

Outline possible reasons for this increase in skin complaints. (10)

This question assessed candidates' knowledge and understanding of learning outcome 3.2: Explain the various types of personal protective equipment (PPE) available for use with hazardous chemicals, their effectiveness, and the factors to consider in their selection (2011 specification); equivalent in the 2015 specification to 3.4: Explain the effectiveness of various types of personal protective equipment (PPE) and the factors to consider in selection of PPE.

This question was well answered by the majority of candidates. Candidates appear well versed in the issues relating to the use of PPE intended for protection of hand and lower arms from harmful chemicals.

Question 2 *Workers at a waste-water treatment plant are at risk of contracting cryptosporidiosis.*

(a) **Explain** how these workers might contract cryptosporidiosis. (4)

(b) **Identify** symptoms associated with cryptosporidiosis. (2)

(c) **Outline** specific control measures that these workers should use to help reduce the risk of contracting cryptosporidiosis. (4)

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 exposure to biological agents at Work (2011 specification) (Explain the assessment and control of risk from deliberate and non-deliberate exposure to biological agents at work in the 2015 specification).

This question was not well answered. Many candidates demonstrated little or no knowledge of cryptosporidiosis, quite a number of candidates confusing it with either leptospirosis or legionellosis.

Cryptosporidiosis is caused by a protozoan parasite (*cryptosporidium parvum*) and is found in water contaminated with human faeces (obviously sewers in this question, but commonly also public swimming baths). It is transmitted by the hand-to-mouth route. These particular workers could easily be in contact with contaminated water or equipment.

Part (c) was better answered as it was a direct application of the general approaches for biological agents. However, most candidates did not notice that the answer had to relate to specific controls that the workers should use (such as hand washing with soap and water, use of disinfectants, use of suitable gloves and prohibition of eating/drinking in work areas). Hence, wider management controls, such as health surveillance or training, did not gain marks.

This area appears to be a clear gap in either what is being taught or what is being learned by candidates. Diseases that are specifically identified in the syllabus are very likely to be assessed at some point.

Question 3 *The hazardous substance called machine-made mineral fibre (MMMMF) has a legally binding occupational exposure limit (OEL) listed in standards. Unusually, there are two OELs. The limit is expressed both as fibre/ml and also as mg/m³:*

*2 fibre/ml 8-hour time-weighted average (TWA);
5 mg/m³ 8-hour TWA).*

Two personal monitoring results, obtained using two different measuring techniques for an operative working with MMMF, are provided below:

Sample Number	Sample Time (hours)	Pump Flow Rate (litre/minute)	Number of Fibres on filter	Weight of MMMF on filter (mg)
1	6 hours	0.5	5625	-
2	4 hours	2.0	-	2

Note:

1000ml = 1 litre
1000 litres = 1m³

(a) **Calculate** the average concentration of MMMF to which the operative is exposed for **EACH** of the two samples shown. **(6)**

You **must** show your working.

(b) **Comment** on the significance of the operative's exposure in terms of future action required to adequately control exposure. **(4)**

Assume the exposure in the time monitored is representative of exposure during the full 8-hour shift.

This question assessed candidates' knowledge and understanding of learning outcome 4.2: Outline the strategies, methods and equipment for the sampling and measurement of airborne harmful substances (Outline the methods for sampling of airborne contaminants in the 2015 specification).

Some candidates had no difficulty with this question while others had difficulty with the calculation, especially the calculation based on fibre count. Some candidates avoided this question altogether (or at least part (a) the calculation), so it is worth giving more advice here on how this question could have been approached.

MMMMF is a little unusual in that it has two OELs. One is based on a fibre count sampling method and one is based on a gravimetric sampling method. This is because MMMF fibres may come as very fine fibres or relatively coarse fibres. However, candidates did not need to know anything about MMMF to answer this question as all the information was provided in the question.

Two samples were collected using these two different methods, respectively, in order to compare with the relevant OEL. This question required candidates to understand the underlying principles of dust/fibre concentration calculations, TWA and comparison with OELs. It may seem obvious, but a good thing to remember is that candidates need to calculate TWA concentrations in the same units as the corresponding OEL. In all other respects the dust calculation is very similar in principle to the fibre calculation.

So, for part (a) sample 1, we first calculate the volume of contaminated air drawn through the pump. This is $0.5 \times 6 \times 60 = 180$ litres. We need to convert this to ml; $180 \text{ litres} = 180 \times 1000 = 180,000 \text{ ml}$. We collected 5625 fibres over the sampling period, so the average concentration is $5625 \text{ fibres}/180,000 \text{ ml} = 0.03 \text{ fibres/ml}$ for the 6 hour sampling time.

For sample 2 (gravimetric method), there is a similar approach (but the units are of course different). Once again, we calculate the volume of contaminated air drawn through the filter = $2 \times 4 \times 60 = 480$ litres. We convert this to m^3 ; $480/1000 = 0.480 \text{ m}^3$. 2mg was collected, so the average concentration = $2 \text{ mg}/0.480 \text{ m}^3 = 4.17 \text{ mg/m}^3$ over the 4 hours sampling time.

Some candidates could calculate the gravimetric sample (sample 2) result, but could not apply this same thinking to the fibre count sample. This could indicate that this area is not especially well taught, candidates having limited understanding of the underlying ideas and thus not able to apply the same principles.

For part (b), candidates were asked to assume that the average concentrations just calculated were representative of the entire shift. That is, the result calculated in part (a) is the TWA for the entire shift, for each respective sample. Candidates simply had to compare the result with the OELs given in the question. It is evident that the fibre value (0.03 fibres/ml) is well below the fibre count OEL (2 fibres/ml) but that the gravimetric value (4.17 mg/m^3) is below, but quite close to the gravimetric OEL (5 mg/m^3). More detailed monitoring would be recommended and, since the gravimetric method is clearly more discriminating (in this case, as the fibre value is so very low) the gravimetric method is the most suitable method going forward.

Course providers need to ensure candidates practice these sorts of calculations and, in particular, thoroughly understand the principles behind them so that they are then confident to answer any question of this type.

Question 4

A fire alarm engineer visits many customers' premises during the working day in order to check that fire alarm sounders are operating at the correct sound level. The engineer does not wear hearing protection.

- (a) **Explain** how the engineer may be at risk of hearing damage. **(3)**
- (b) **Explain** how the engineer's personal noise exposure should be determined. **(7)**
-

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 and 6.3: Explain the measurement and assessment of noise exposure.

For part (a) many candidates gained at least 1 mark, typically for the idea that frequent exposure could lead to hearing loss. However, some candidates saw that the key to unlocking this question was to recognise that the engineer would experience frequent but brief exposure to very loud noise that, over the course of time, could exceed legal limits and lead to hearing damage. Some candidates mistook this question as requiring a description of the different types of hearing damage that could be sustained. However, this question was looking for the probable causation of hearing damage.

For part (b) most candidates correctly assumed that a personal sound level meter/dosimeter would be used (given the fact that the engineer is highly mobile and the noise levels are likely to be highly variable from day to day). However, few candidates could explain further than this, including such things as equipment calibration, fitting the dosimeter microphone close to the worker's ear, keeping of a daily work log (sources of exposure), the dosimeter indicates L_{Aeq} (and ideally should have a data logging function) and conversion of the result to $L_{EP,d}$. Some candidates wrongly assumed that audiometry is the method for determination of personal noise exposure (rather than a method for determining hearing damage).

This question was not well answered. Candidates and course providers need to concentrate more on personal noise exposure measurement techniques/instrumentation to answer this type of question well.

Question 5

A bus company operates a fleet of buses to provide transport for passengers in a busy city. The bus driver is the only bus company worker on each bus. Bus drivers are sometimes subject to violence.

(a) **Outline** why these bus drivers may be at an increased risk of violence. (5)

(b) **Outline** practical control measures to help reduce the risk of violence to these bus drivers. (5)

This question assessed candidates' knowledge and understanding of learning outcomes 8.3: Explain the scope, effects and causes of work-related violence/aggression; and 8.4: Explain the identification and control of work-related violence/aggression with reference to relevant standards.

This question was about a scenario that should have been familiar to most people. The key was to relate those principles to this scenario.

Part (a) was quite well answered, although sometimes answers lacked enough detail to gain many marks. Most candidates saw that lone working (seen as more of a target), ill-behaved passengers, dissatisfied passengers (eg having to wait too long for the bus to arrive) and passengers attempting to avoid paying, were also likely sources of increased risk of violence.

For part (b), which was generally well answered, some candidates did not notice that this was limited to practical control measures and so mentioned risk assessments and violence policy, which did not gain marks. Good answers outlined measures such as barriers between passenger and driver, cashless systems (smartcards, pre-paid tickets), security cameras, vehicle tracking devices and alarms/communications to control room.

Question 6 *Dilution ventilation is sometimes 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. (3)

(b) **Explain** how an effective dilution ventilation system is designed and operates to reduce exposure to a hazardous substance. (4)

(c) *The following specification applies in an open-plan workshop:*

<i>Workshop dimensions (metres):</i>	<i>10m x 10m x 3m</i>
<i>Volume of air throughput each hour:</i>	<i>3000m³</i>
<i>Required air changes per hour:</i>	<i>10 to 15</i>

Calculate the actual number of air changes per hour **AND comment** on the suitability of the specified dilution ventilation system. (3)

This question assessed candidates' knowledge and understanding of learning outcome 3.1: Explain the purpose and operation of local exhaust ventilation and dilution ventilation including assessing and maintaining effectiveness (the equivalent to 3.3: Explain the uses and limitations of dilution ventilation and the purpose and operation of local exhaust ventilation, including assessing and maintaining effectiveness, in the 2015 specification).

This area of the syllabus does not appear to be well taught. Many candidates did not seem to have much knowledge of dilution ventilation and the circumstances in which it may be appropriate. Some candidates thought dilution ventilation was something you used in confined spaces and were unable to distinguish its use from that of LEV, as they often provided answers about LEV rather than dilution ventilation. Dilution ventilation can be considered as a control option in a number of circumstances including when the hazardous substance has low toxicity (or high OEL), has a low generation rate and is a fume, vapour or gas (but not a dust).

For part (b) candidates again confused dilution ventilation with LEV and often did not relate its use to how it reduces exposure to hazardous substances. For example, candidates needed to explain that air input can be passive (natural air movement) or active (via fans), that clean input air mixes with contaminants to dilute the contaminant concentration, hence reducing exposure levels. Also expected was some explanation of positioning of air inlets and outlets being dependent on relative density of the contaminant and to avoid dead-spots. Finally, candidates could have noted that air throughput (air changes) needed to be sufficient to reduce concentrations to safe levels.

Many candidates did not attempt part (c) but those who did attempt it gained good marks. The volume of the workshop could be calculated from the data provided: $10 \times 10 \times 3 = 300\text{m}^3$. The air throughput is $3000\text{m}^3/\text{hr}$, which means that, every hour a volume equivalent to 10 times ($3000\text{m}^3/300\text{m}^3 = 10$) the volume of the workshop passes through it. In other words, there are 10 'air changes' per hour. This is just within the specification (10 - 15 air changes per hour) but a recommendation would be to increase the throughput so it is closer to 15 air changes per hour.

Dilution ventilation is an area of the syllabus that needs more attention from course providers and candidates.

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- Question 7** *Workers in carpentry workshops and sawmills may be exposed to hardwood dust.*
- (a) **Outline** the risks to health from hardwood dust. (5)
- (b) **Identify** types of respiratory protective equipment (RPE) that could be used by the workers. (3)
- (c) Other than providing RPE, **outline** control measures that should be considered in order to protect those who are exposed to hardwood dust. (12)
-

This question assessed candidates' knowledge and understanding of learning outcomes 1.4: Explain the health effects of chemicals used in the workplace; 2.2: Explain elimination of risk or control measures for chemicals which are hazardous to Health; , and 3.2: Explain the various types of personal protective equipment (PPE) available for use with hazardous chemicals, their effectiveness, and the factors to consider in their selection (2011 Specification); equivalent to 2.2: Explain the identification, classification and health effects of hazardous substances used in the workplace; 3.1: Explain the principles of prevention and control of exposure to hazardous substances (including carcinogens and mutagens); and 3.4: Explain the effectiveness of various types of personal protective equipment (PPE) and the factors to consider in selection of PPE, in the 2015 specification.

Candidates performed reasonably well overall with this question but often lacked range to gain high marks. For part (a) most candidates were able to outline some health risks, including contact dermatitis, sensitisation dermatitis and asthma. However, few candidates mentioned nasal cancer or rhinitis. Some candidates went a little off track and began to outline how different particle sizes of dusts are deposited at different sites in the lungs.

For part (b) types of RPE expected included disposable respirators, reusable respirators, powered masks and hoods.

Part (c) was better attempted but too few candidates provided the range of responses necessary to gain high marks with most gaining only half the marks available. Candidates were able to outline control measures including provision of information to workers on the dangers, the use of LEV, enclosure of the process, and personal hygiene measures. Health surveillance was sometimes mentioned but not in sufficient detail to gain marks. Points missed were warning signs to designate hazardous areas, the setting aside of separate areas for eating, vacuum cleaning of machinery/workplace and monitoring airborne concentration levels.

Question 8

Nurses working in a radiotherapy treatment facility use a liquid to treat patients that contains an ionising radioactive material. The liquid is prepared by the nurses before they administer it to the patients. After the treatment, they clean the area and equipment before disposing of any remaining liquid.

- (a) **Outline** *how nurses could be exposed to the radioactive material while carrying out this work AND, in EACH case, identify the corresponding route of entry.* (4)
- (b) **Outline** *practical control measures to help reduce the nurses' exposure to the radioactive material while they are carrying out this work.* (16)
-

This question assessed candidates' knowledge and understanding of learning outcome 7.3: Explain the effects of exposure to ionising radiation, its measurement and control (Outline the effects of exposure to ionising radiation, its measurement and control, in the 2015 specification).

This was quite an unpopular question. Part (a) about how liquid chemical contaminants can enter the body was generally well answered.

Part (b) was not often answered with the detail and focus that was needed. Answers were too frequently vague and general but needed to be specific to the tasks identified in the question. Some candidates suggested impractical solutions, such as substitution of the ionising radioactive material for something that is not (which would of course then mean it was no longer radiotherapy).

Candidates often took a traditional 'time, distance, shielding' approach to this question, without fully considering the context and nature of the radioactive material. This approach would only go so far, bringing up issues of monitoring nurses exposure using TLDs, using radiation monitoring equipment to check for contamination, using shielded containers to transport and store the liquid and wearing lead aprons when with the patient. For a more holistic approach it is also helpful to view liquid radioactive compounds as a toxic chemical contaminant. For example, the use of gloves, eye protection and face mask when preparing the liquid, having a dedicated room to prepare the liquid, use of a ventilated cabinet, covering wounds with waterproof dressings, having spill kits available and having hand washing facilities available.

The topic of liquid radioactive materials does not seem to be well taught or understood and this is an area that needs more attention from course providers and candidates.

Question 9	<i>In deep underground mines there are high temperatures and high levels of humidity. These conditions arise naturally from the surrounding earth as well as through mining processes.</i>	
(a)	Identify specific health effects associated with working in these conditions.	(2)
(b)	(i) Explain how the working conditions can affect the health of the workers.	(3)
	(ii) Explain how the working conditions can affect the safety of the workers.	(1)
(c)	Outline practical control measures to help reduce the risks associated with working in an environment with high temperatures and high levels of humidity.	(14)

This question assessed candidates' knowledge and understanding of learning outcome 10.1: Explain the need for, and factors involved in, the provision and maintenance of thermal comfort in the work environment (Explain the need for, and factors involved in, the provision and maintenance of temperature in both moderate and extreme thermal environments, in the 2015 specification).

This was quite a popular question and well answered by some candidates. The key to this question was recognising that this was not about mining but instead about the hot and humid conditions down a mine. The heat is generated by natural processes (the origin of geothermal energy) as well as the use of machinery. Humidity also arises from natural processes (groundwater) as well as processes such as cleaning of machinery. Candidates who recognised this (from the signposts in the question) had little trouble coming up with a range of sensible answers.

Candidates therefore did not need to know anything about mining to gain good marks at this question. They simply had to apply their knowledge and understanding of thermal comfort issues to this scenario.

Part (a) presented no real problems for candidates. Answer to part (b) were sometimes limited, with some candidates forgetting the context was heat and humidity and instead considered wider mining issues such as dust. In terms of health, an explanation was expected to include that high humidity reduces the ability of the body to lose heat by evaporation, which causes an increase in the core body temperature, resulting in heat stroke, which can ultimately be fatal. Safety is influenced because these conditions can cause difficulty in remaining alert, leading to greater chance of mistakes or accidents.

Part (c) was quite well answered. Where candidate had difficulty it was usually due to focus on too narrow a range. Most candidates identified the need for ventilation (although some thought this must be LEV), cooling, supply of isotonic drinks, regular breaks in cool refuges and use of light clothing that allows sweat to evaporate. Points that would have gained marks were switching off unnecessary heat-producing equipment (or when not needed), controlling water sources to minimise humidity (such as stopping leaks, clearing up spillages) and acclimatisation.

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- Question 10** *Farmers, veterinary workers and sheep shearers often need to manually handle live animals such as sheep, pigs or goats as part of their work. In these situations the load is the live animal.*
- (a) **Describe** factors associated with the load that increase the risk of these manual handling activities. (4)
- (b) **Outline** a range of other factors that should be considered when carrying out manual handling risk assessments in these situations. (6)
- (c) **Outline** practical control measures that could be used in these situations to help reduce the risk of a manual handling injury. (10)
-

This question assessed candidates' 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.

This was a popular question. Key to this question was that it was not about farming but dealing with an unpredictable load. Candidates could therefore apply a manual handling risk factor framework in that context to gain good marks. Some candidates wasted effort by not properly reading the question.

Part (a) required a concentration on the load (the question told candidates that the animal was the load) and part (b) widened that to consider the other risk factors. For part (a) candidates usually noted issues such as the animal can be heavy, awkward to grip and has unpredictable movement. Given the context, some candidates also noted the issue of the handler being injured from horns/teeth/tusks/hooves. Few candidates mentioned the animal breed and state also has a bearing on aggressive tendency, as does the mood of the animal.

Part (b) considered the other factors (many candidates easily using the standard TILE or LITE mnemonic (but remembering 'L' for load, had already been discussed in part (a) and was not required for part (b)). Most candidates had little difficulty with this although some candidates mentioned all factors in (a) and (b) and so wasted effort.

Part (c) was quite well answered. It was a straightforward application of manual handling control options in context. However, some candidates forgot the context and suggested less practical controls such as dividing the load up into smaller parts (not sensible unless the animal is killed), putting handles on the sheep and writing the weight on each animal. There was a fair number of candidates who recognised the need for specialist skills training in animal handling techniques and awareness of animal behaviour; also the need for handlers to work in pairs or part of a small team. The most common response was to recommend devices for animal handling including barricades, fixtures, crates, as well as lifting aids. Also commonly covered was the need for appropriate PPE, such as gloves, protective boots and snugly fitting clothing.

Selection of breeds on the basis of docility was rarely mentioned. A few candidates suggested sedating the animal before handling.

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- Question 11** (a) *Construction workers are at risk of developing hand-arm vibration syndrome (HAVS).*
- (i) **Outline** factors that may increase this risk. (5)
- (ii) **Outline** the steps of a health surveillance programme for workers who are exposed to hand-arm vibration. (5)
- (b) *A construction worker has been off work for a period of time suffering from HAVS and the employer's occupational health department wants to find out if they are fit to return to work.*
- (i) **Outline** the way in which symptom severity of HAVS is classified using the Stockholm scale. (5)
- (ii) **Outline** options that the occupational health department can suggest to the employer if the occupational health doctor decides that the worker cannot return to the work that exposes them to vibration. (5)
-

This question assessed candidates' knowledge and understanding of learning outcomes 6.5: Explain the basic physical concepts relevant to vibration; 6.7: Explain the measurement and assessment of vibration exposure; 6.8: Explain the principles of controlling vibration and vibration exposure (Explain the principles and methods of controlling vibration and vibration exposure in the 2015 specification); and 11.3: Outline the management of occupational health (including the practical and legal aspects) (the equivalent to 1.3 in the 2015 specification).

This was not a popular question and was generally not well answered.

Part (a) (i) was the best answered of all sections. Large numbers of candidates were able to recognise that the vibration magnitude and lack of equipment maintenance or condition of the equipment were major factors in the induction of HAVS. Cold working conditions, poor training and holding the tools too tightly were commonly mentioned. Some candidates were able to recognise that smoking can be a factor in reduction of blood flow and therefore a factor in inducing HAVS.

For part (a) (ii) many candidates were able to identify the use of questionnaires on medical history as an initial baseline assessment. But few outlined any more than that, such as annual screening questionnaires, referral for HAVS assessment (if symptoms reported) which would involve assessment of grip strength, vascular and neurological function.

Common pitfalls were either to repeat parts of part (a) or outline proper usage of the equipment used. Candidates generally did not recognise the need for a systematic stepwise approach to assessing lower levels of sufferers through to recognising and working with the more acute or chronic forms of the condition. In other words, candidates did not recognise that preliminary assessment was a prelude to examination by a qualified person or occupational health doctor or further referral.

Part (b) (i) was often missed out completely, as few candidates seemed to have any knowledge of the Stockholm scale.

Answers to part (b) (ii) were also limited. Again, there was neglect of a stepwise approach to alternatives to a return to the previous place or type of work. Options could include a range from recommending a return to normal duties (if this involves no vibration exposure), to adapting the existing job if possible to remove vibration exposure, and finally recommending termination of employment on medical grounds. It was important too to determine if the vibration was indeed work-related or not.

Performance of this question indicates that occupational health management for HAVS is a weak area among candidates. However, it is an important topic that requires attention as it affects many workers, especially in construction.

Examination technique

The following examination techniques are consistently identified as the main areas in need of improvement for candidates:

Candidates misread/misinterpreted the question

Careful and thorough preparation for the examination is vital for candidates. Accredited course providers should assist candidates in setting out and applying sound revision and examination practice and preparation techniques to ensure that they are well prepared for the examination. This includes ensuring that candidates carefully read the question to determine exactly what is being asked and answer accordingly.

Examiners noted that there was evidence of candidates not understanding the question that was asked and therefore providing an answer that was not relevant to the question.

The range of English language skills demonstrated in the examination by candidates varies enormously. Examiners often find themselves faced with scripts where candidates do not appear to have understood the question and struggle to write a coherent answer in English. Candidates for this examination should satisfy the required IELTS Level 7 language requirements. Course providers are reminded that it is incumbent on them to provide appropriate advice and guidance to candidates to help ensure that they stand a reasonable chance of success in the study of the NEBOSH Diploma.

There were numerous examples of quite long, detailed answers that suggest practical experience but do not focus on the question being asked. This may be a result of candidates either not reading the question properly, or because of possible language issues where candidates do not understand what the question is asking.

The examination is assessing candidates on their understanding of 'managing' health and safety and a number of candidates did not seem to grasp this resulting in long, detailed answers on such issues as 'what to look for in an audit' rather than how to prepare for and manage an audit.

Examiners ask questions based on the syllabus. Points, no matter how valid, but unrelated to the question being asked, will not attract any marks. Candidates should note that where there is emphasis in a question (eg by the use of italics) it is to guide candidates towards a particular point. Reading and re-reading the question encompasses taking due note of this emphasis.

Candidates' handwriting was illegible

The examination situation is a stressful time for candidates and while the examination is not a test of the English language or handwriting scripts must be legible for Examiners to mark them fairly. As the examination progresses, candidates can become both mentally and physically tired. In an increasingly electronic age, professional people do not have the same need to write text in longhand. However, to pass this examination it is an essential and necessary part of the preparation to rehearse writing questions in full and in the time allocated.

When practicing examination technique, candidates should hand-write their answers and get feedback from their course providers on legibility (as well as how they performed).

Course providers need to identify those candidates whose handwriting is illegible and provide them with appropriate advice. Examiners cannot award marks for answers that they are unable to read.

Candidates unnecessarily wrote the question down

There are 15 minutes to answer a 10-mark question in Section A and 30 minutes available to answer a 20-mark question in Section B of the question paper. This time will be required for reading, re-reading and understanding the question, developing an answer plan on the answer booklet and finally committing the answer to the answer booklet. The efficient use of time is essential in order to answer the 9 questions within the 3 hours available. The majority of Examiners reported that candidates felt it necessary to write the question out in full, before providing the associated answer, and this limits the time available. Course providers should remind candidates that it is not necessary to include a question with their answer.

Good examination technique is followed where the candidate frames the answer in the context of the question, rather than rewriting the whole of the question. As with the other examination technique points above, good examination technique is developed through practice and good preparation.

Candidates repeated the same point but in different ways

In some cases candidates tended to make the same point more than once, eg training. Once a valid point has been made and the mark awarded Examiners will not be able to award the mark again. Unless otherwise stated, most questions require candidates to respond with a wide range of issues to gain high marks. Consequently candidates should take care when using terms that contain numerous points that should be made separately.

Accredited course providers should brief candidates on examination technique by way of understanding what points are mark worthy in an answer and those that are not.

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.

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

Examiners report a high incidence of candidates writing down answers they have memorised from previous Examiners' Reports. These answers often relate to a similar, but different question, to which the memorised answer is not wholly applicable. For example, it may require a different aspect of the topic or relate to a different scenario.

Candidates are expected to apply their knowledge and understanding to the actual question given, not the question they think they see. This is why it is extremely important that candidates understand and are able to apply their knowledge, and not just memorise. Course providers should help candidates apply their knowledge to a range of different scenarios to aid understanding of the topic.

Candidates did not allocate enough time to the question

Some candidates were unable to give answers of sufficient depth to warrant good marks and sometimes spent more time on questions carrying fewer marks than was warranted by the command word.

Candidates need to take note of the fact that answers in Section A are worth 10 marks and those in Section B are worth 20 marks. The Examiners' expectation is that more detailed answers are required in Section B. Some candidates spend a disproportionate amount of time in writing long answers to Section A questions at the expense of time spent on the more in-depth answers demanded in Section B. Proper preparation and 'mock' examinations can help to correct this.

Accredited course providers should ensure that candidates are given adequate opportunity to develop examination skills to ensure that answers are provided to the depth and breadth required.

Structured Answers

It is important for candidates to structure their answers as this helps cover all the requirements of the question without losing focus. It is good examination technique to look for the principles or the concepts that underpin the topic and to use those as a basis for delivering a structured answer.

Candidates answered by posing a question

Candidates need to resist the temptation to present their answers as merely a series of questions. 'Outline' requires candidates *'To indicate the principal features or different parts of'* and this is not done through posing questions to the Examiners.

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:

Outline

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

Most candidates are familiar with the requirements of 'outline'. However, a number of candidates expect that by listing or giving bullet points that will be sufficient. At this level of qualification candidates are expected to be able to construct sentences around their answers.

An 'outline' question requires candidates to give the main issue and then provide the key features in the context of the question. Where a question that requires candidates to '**outline** the issues to be addressed in the development of an audit system' the response should provide adequate context to the issues in order to gain the marks. An answer that merely includes issues such as 'scope, training, commitment, etc' will not gain good marks since while the issues are relevant there is no context to the issues in relation to the question asked.

Candidates should provide context to the point being made to demonstrate understanding of the subject.

As required by a Diploma level qualification candidates should be able to demonstrate a detailed understanding of the subject matter and therefore be able to summarise and contextualise technical points in the field of health and safety. Those candidates who did provide good outlines to questions demonstrated understanding of the topic without going into too much detail.

If asked to '**outline** the purpose of local exhaust ventilation' in a given scenario, an answer such as 'contaminant removal, exposure limits' would be insufficient as this represents a listed answer. However, removal of contaminant at source (as far as possible) and ensuring exposure limits are not exceeded would higher gain marks.

If asked to '**outline** how health risks from exposure to lead should be managed...' in a given scenario, an answer such as medical tests, PPE, RPE would be insufficient as this represents a listed answer. However, surveillance tests for lead in blood/urine, the use of PPE such as overalls, the use of RPE such as respirator with appropriate particulate/fume filters would gain marks.

Explain

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

Many candidates are still not properly prepared for this command word. A list of points (no matter how relevant) will not satisfy Examiners when the command word is 'explain'. So for example, where candidates were asked to explain the circumstances where heat and smoke detectors would be inappropriate, Examiners were looking for candidates to explain that heat detectors would be inappropriate in environments where temperatures fluctuate suddenly during normal work activities. Just saying 'workshops', for example, is not enough to provide an answer to an 'explain' question.

Commonly, candidates do not provide adequate detail in relation to this command word, eg '**explain** limitations of relying on accident numbers only as a measure of health and safety performance'. An appropriate response would provide the reader with reasons why relying solely on accident numbers would not provide a comprehensive view of the organisational performance in health and safety, eg accident numbers do not indicate incidence of ill-health and accident data may go up following initiatives following underreporting, etc.

Candidates are generally unable to provide clear answers where this command word is used but that may be due to lack of knowledge rather than not understanding what is required, since an explanation requires the candidate to provide reasoning for their answer. For example, when a question specifies 'explain' the candidate is required to provide an understanding or make clear an idea or relationship. For example '**explain** how malaria is transmitted to humans'. If a candidate responded with *mosquito bites humans* this would be insufficient to merit full marks as this does not provide a deep enough understanding or relationship from the specified command word or the context in which the question is asked. However, a candidate would get full marks if they elaborated on this stating that the disease originates with the plasmodium parasite that is then transmitted to humans via a bite from a feeding female mosquito that carries it; the parasite then transferring to the human blood stream, travelling to the liver.

Describe

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

Candidates are required to provide a word picture in response to this command word and therefore the candidate needs to have a good understanding of the topic of the question in the examination in order to gain good marks. Typically, a limited response to this command word will be an inadequate amount of detail in the answer.

For example, when asked to describe the contents of a safety policy candidates should provide the Examiner with relevant information about the contents of the policy, eg 'the policy should contain details of the organisational commitment to health and safety'. This would be supported with specific targets and commitment resource to ensuring compliance as a minimum but developing the health and wellbeing of the employees, etc'. An answer that goes no further than listing the topics of to be covered in the policy would not attract good marks in the examination.

In the examination, lists and single word answers will rarely satisfy the requirement of the Examiners in terms of answering the question at this level. It is noticeable that the well prepared candidate has less trouble deciphering command words and tends to gain good marks whereas those candidates who use single word answers will tend not to have the knowledge to write anything further in the context that is required.

Give

Give: Only a short answer is required, not an explanation or a description.

'Give' is normally used in conjunction with a further requirement, such as '**give** the meaning of' or '**give** an example in **EACH** case'.

In some circumstances candidates may spend too much time giving unrequired detail in response to this command word. It is often used in conjunction with the meaning of a phrase or statement and candidates can overelaborate the required answer. Time management is important in the examination and candidates should ensure that they respond with appropriate brevity where the command word and available marks suggest that is all that is required.

When asked to '**give** the meaning of motivation', it would appropriate to say that 'motivation is the driving force that leads an individual to behave in a certain way'. It would not be appropriate to discuss in detail different motivational theories.

On the whole most candidates respond well to this command word, often by offering a definition. There is evidence where candidates go into too much detail that left those candidates writing large amounts of text for very few marks.

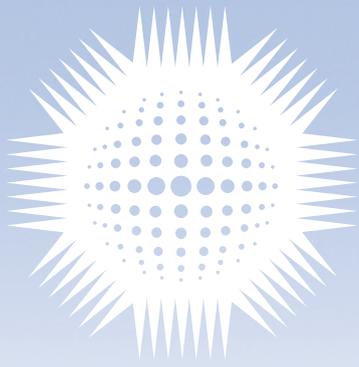
Identify

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

As with 'give' above it is not uncommon for candidates to overelaborate their answers in response to this command word. It is adequate for a candidate to provide the key point to the Examiner without further developing the point with supporting theory or examples unless they are specifically asked for.

When providing a response to 'identify' the mental selection and naming of an answer that relates to the question should be sufficient. In most cases, one or two words would be sufficient to be awarded corresponding marks. Any further detail would not be required and impacts negatively on the time limit for completing the examination. For example, if the question was '**identify** possible effects on the body when someone is exposed to lead' suitable responses would include developmental effects in unborn babies, anaemia, nausea/vomiting in order to be awarded a mark.

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.



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