

July 2015

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

JULY 2015



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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) regulatory requirements.

This report provides guidance for candidates which it is hoped will be useful to candidates and tutors in preparation for future examinations. It is intended to be constructive and informative and to promote better understanding of the syllabus content and the application of assessment criteria.

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Any enquiries about this report publication should be addressed to:

NEBOSH
Dominus Way
Meridian Business Park
Leicester
LE19 1QW

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

General comments

Many candidates are well prepared for this unit assessment and provide comprehensive and relevant answers in response to the demands of the questions. 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.

This report has been prepared to provide feedback on the standard date examination sitting in July 2015.

Feedback is presented in these key areas; examination technique, command words and learning outcomes 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.

Candidate performance

This report covers the examination sitting in July 2015.

Learning outcomes

Question 1

1.1 Outline the principles of control of chemicals

This part of the syllabus is concerned with the range of approaches that can be used to adequately control chemical exposure. This particular question required candidates to be familiar with employer responsibilities contained in the ILO Chemicals Convention C170, applying them to a large chemical manufacturer.

Candidates often gave very general answers based on risk assessment and hierarchy of control principles. Nonetheless many candidates were able to outline relevant issues such as the classifying the chemicals (manufactured) in accordance with national standards; making sure the chemicals (raw materials) used are properly labelled and have safety data sheets available; keeping records of the chemicals used (and making this information available to workers); assessing exposure of workers; ensuring that exposure of workers is below national exposure limits and that exposure of workers is monitored (if applicable). The use of various control approaches (elimination, substitution, engineering controls, personal hygiene, PPE) was also relevant.

Most candidates did reasonably well in this question but some lacked sufficient detail to gain high marks. Some misread the question and just considered issues affecting the end user rather than the manufacturer. Many of the issues are common, but a specific manufacturer issue is properly classifying the chemicals that they produce before they make them available to others. This is a primary source of information that is used in helping properly assess exposure risks.

Question 2

9.2 Explain the assessment and control of risks from repetitive activities, manual handling and poor posture

There are now available a wide range of tools to help identify and assess ergonomic risks. This question concerned one such tool, the HSE's Assessment of Repetitive Tasks (ART) tool.

The ART tool considers factors such as frequency of movement, force, work pace and precision required. It uses a systematic approach, starting with observing the task, consulting with those who carry out the task and ending prioritisation of risk reduction measures based on an exposure score. The ART tool is best suited to tasks such as assembly or production. It is not suited for things such as computer workstation assessments.

Candidates appeared to have little or no knowledge of this area (of both the tool, its purpose and how it is used) and, for the most part, this was poorly answered. Instead, candidates appeared to try to use a task-individual-load-environment (TILE), as used in manual handling assessments. This is clearly an area that is not well taught. Some candidates assumed 'tool' here was a type of work equipment rather than a methodology and some candidates did not attempt this question at all.

Question 3

3.1 Explain the purpose and operation of local exhaust ventilation and dilution ventilation including assessing and maintaining effectiveness

Candidates are expected to have an understanding of why local exhaust ventilation (LEV) may be used as part of a control strategy and how to make sure that it is effective (and remains so).

Candidates do not appear to be aware of the purpose of LEV, but are at least familiar with the component parts of a typical system (many candidates provided that, even though this question did not ask for that). LEV is one of the main measures for removing airborne contaminants at source of generation and/or the operators breathing zone. It removes contaminants to a safe place outside the workplace or may use filtration (or other treatment) to remove the contaminant. This helps ensure exposure limits are not exceeded. It may also be useful in diluting potentially flammable vapours to below their lower flammable limit.

Candidates seemed more aware of the information that might be contained in an LEV system examination and test report. However many concentrated their efforts purely on the range of performance tests and equipment (such as for face velocity) or visual checks, but unfortunately were not able to suggest items relevant to a report much beyond this. Fewer candidates were able to note items such as location of the LEV, the process or substances being controlled and information about the systems intended design performance and so gained higher marks.

Question 4

4.3 Outline the principles of biological monitoring

Candidates still confuse biological monitoring with the topic of biological agents (bacteria, viruses, fungi, parasites) or even airborne monitoring. Course providers need to stress the differences so that candidates are less likely to provide a wholly inappropriate answer. This question required candidates to think about the timing and frequency of biological monitoring in the workplace and other more general issues that would need to be considered when setting up a biological monitoring programme.

Candidates were unaware of timing and frequency considerations, such as the requirement of legislation; biological half-life of the substance (the time it takes for the concentration to drop to half); the uptake curve and individual variables.

Candidates generally fared better when asked about biological monitoring programmes. Many were able to provide relevant points including whether it was a legal requirement; the requirement for cooperation and consent from workers; the need for trained personnel, facilities and equipment for sampling, sample storage and analysis; the need for confidentiality and consideration of what actions to take if results indicate reference values are exceeded for an individual worker.

Question 5

6.6 Explain the effects of vibration on the individual

6.7 Explain the measurement and assessment of vibration exposure

This question concerned hand-arm vibration. Candidates were expected to know the ill-health effects of hand-arm vibration syndrome (HAVS). The majority of candidates gave good answers to this, being able to provide responses including loss of dexterity/grip; blanching of the fingers and numbness/tingling.

When asked about the factors to consider in assessing the risk of vibration exposure, candidates gave very mixed answers. Some used a generic risk assessment approach and so failed to cover the specific risk factors relevant to vibration. However, many were able to gain good marks, giving responses including identification of the vibration sources; consideration of the relevant exposure limits; the available vibration emission data (manufacturer data as well as measurements); the duration of exposure (trigger time); the nature of the materials being worked on and the age or condition of the power tools being used. It seems that some candidates misinterpreted 'factors' to mean 'control measures'. As a result, these candidates ended up providing items that were not asked for and ignoring things that they were asked for.

Question 6

8.1 Explain the scope, effects and causes of work-related stress

8.2 Explain the identification and control of workplace stress with reference to relevant standards

Stress in the workplace is a significant mental health issue. This question probed candidates' knowledge of aspects of the stress management standards, concentrating on the areas of demands, support and relationships in a typical workplace scenario - that of a call centre. Candidates were expected to outline factors that contribute to workplace stress in each of these categories. For *demands*, candidates were expected to discuss factors including work overload, unacceptable work patterns and poor workstation design; for support, factors such as lack of encouragement from managers and the lack of any system for raising concerns; for relationships, factors such as high staff turnover, aggressive customers, lack of trust in colleagues and the feeling of isolation (due to the working arrangements).

Most candidates had adequate knowledge of this area but some were unable to distinguish between factors relevant for each of the three categories (demands, support, relationships). Nearly all candidates also included irrelevant detail on home relationship issues, when the question clearly focused on the occupational factors.

Question 7

10.2 Explain the need for adequate and appropriate lighting in the workplace, units of measurement of light and the assessment of lighting levels in the workplace

This area of the syllabus explores the importance of adequate lighting. The question focused on the safety implications of poor lighting and how to ensure good lighting in the workplace.

Apart from a few isolated examples, knowledge of this area by candidates is poor. Candidates had a tendency to repeat the same point in different ways. The question also focused on safety issues and not health issues. Thus, candidates providing health examples such as headaches and eyestrain were not relevant. Most candidates were able to include that failure to see properly may cause accidents (hazards not being identified) but could not say much beyond that. Other issues include that stroboscopic effects may cause moving parts to appear stationary (and again, the hazard may not be appreciated); and artificial light may change the apparent colour of objects, again causing confusion of things such as standard colours used in safety signs.

In terms of factors to consider in ensuring adequate and appropriate lighting in the workplace, candidates tended to adopt too generic an approach and so lacked sufficient detail to gain high marks. Instead, required responses included the need to consider the nature of the tasks being carried out in the area (such as detailed, precision work); the workplace layout; effect of the surfaces (reflectance of walls); taking into account the individual (age/disability); avoidance of glare using diffusers; taking into account relevant lighting standards; the type and colour of light and the use of natural light as far as possible.

Question 8

1.3 Describe the main effects and routes of attack of chemicals on the human body

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

The question was about potential exposure to lead in a lead-acid battery manufacturing facility.

Most candidates were able to identify the likely routes of entry of lead-based substances into the body in the scenario. Few appeared to be aware of the possible effects on the body of high lead exposure. A few candidates even appeared to confuse lead with exposure to ionising radiation. Well prepared candidates were able to identify effects including headaches, tiredness, constipation, anaemia, kidney, nerve and brain damage.

When asked to outline suitable control measures, many answers were too generic. Thinking about the hierarchy of control can be a good strategy but unless this is made more specific to the scenario, it is difficult to gain high marks. Better informed candidates were able to provide answers that included restricting vulnerable groups from working in certain parts of the factory; using ventilation; the prohibition of eating/smoking in contaminated areas (hand to mouth transfer); the provision of washing and changing facilities. There should be a programme of airborne monitoring for lead as well as medical surveillance (blood lead levels) and action taken should the regulatory limits be exceeded.

Again, some candidates appeared to adopt a strategy more appropriate for either ionising radiation or biological agents indicating that this area of the syllabus is not well understood.

Question 9

5.2 Explain the assessment and control of risk from exposure to biological agents at work

This question focused on malaria and answers were mostly generic and poor. Most candidates were not aware of how malaria is transmitted to humans or incorrectly assumed it was a bacterial infection spread by poor hygiene. Malaria is caused by the plasmodium parasite which is transmitted by a female mosquito feeding on human blood. The parasite travels through the blood vessels to the liver. It can also be transmitted to humans through blood transfusions of infected blood.

Some candidates were aware of the symptoms of malaria but few provided sufficient detail. Symptoms include a fever (flu-like) and cycles of sudden coldness, shivering, fever and sweating (paroxysm).

Most candidates were aware of some control measures such as the use of repellents (eg DEET and electronic devices), the use of mosquito nets and the taking of prophylaxis (eg malarone). A wider range of responses was expected, including indoor spraying; destruction of the habitat (draining of marshes); bio control through the use of parasites and the use of mosquito traps.

Question 10

6.2 Explain the effects of noise on the individual and the use of audiometry

6.4 Explain the principles of controlling noise and noise exposure

This question explored the range of physiological effects of noise exposure and the control measures that might be needed in a large print workshop.

Most candidates were aware of the physiological effects of noise (such as tinnitus and permanent threshold shift) but some unnecessarily also provided psychological effects (that were not asked for and so gained no marks).

In terms of control measures, candidates often adopted a generic approach and so lacked detail. Some were able to note replacement of older, noisier equipment with ones that emit lower noise levels; the use of enclosures and acoustic screens; the provision of hearing protection and ensuring it is used; training for workers on the hazards and precautions and reducing worker exposure by job rotation. Candidates could also have responded with measures including isolation of noisy equipment in another area of the workshop; the use of active noise cancellation; creation of noise havens for workers; the designation of hearing protection zones (with signs to that effect); choosing of hearing protection based on octave band analysis; monitoring hearing using audiometry.

Question 11

11.3 Outline the management of occupational health (including the practical and legal aspects)

This question focused on drugs and alcohol in the workplace.

Most candidates were able to identify the signs an employer would look for to determine whether a worker had a drugs or alcohol problem, although some strayed into criminal/legal aspects outside the workplace. When asked about typical situations where drugs and alcohol testing might be appropriate, there was a tendency to provide a very narrow range of answers. Most were able to note that it was appropriate where there was a reasonable grounds for suspicion (such as after an accident) and in cases of safety critical roles/jobs. Candidates could also have identified cases such as following a job offer; random testing (ongoing deterrent) and as part of drugs rehabilitation.

This part of the syllabus also expects candidates to be aware of the difficulties employers might encounter in introducing a drugs and alcohol testing programme. It was unclear whether candidates simply did not know or misread the question, as candidates tended to focus more on the testing itself rather than wider issues of introducing such a programme. As usual with such programmes, employers are likely to experience issues of concern from workers (confidentiality, consent) and being very clear what action is to be taken following a positive test result. There are also the well-known issues of the conflict with prescribed medication showing as a positive test result and the practical difficulties of arranging testing of shift workers and peripatetic workers.

Examination technique

The following examination techniques were identified as some of the main areas of improvement for candidates in this sitting:

Candidates did not respond effectively to the command word

This is a recurring issue where an outline or description is asked for but candidates provide considerably less than this, often little more than a list of items. This strategy will not gain high marks. More information on command words is given later in this report.

Candidates repeated the same point in different ways

Examiners reported that many candidates focused on a narrow range of items, especially giving the same point from different perspectives (or many different examples of the same issue). This tends to waste effort. Unless otherwise stated, most questions require candidates to respond with a wide range of issues to gain high marks.

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

Examiners reported 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 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 and understanding the question, developing an answer plan mentally or in brief note form 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 marginally limits the time available. Course providers should remind candidates that it is not necessary to include a question with their answer.

Command words

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

Explain

This proved the most difficult level for candidates, specifically, struggling with the difference between 'explain', 'describe' and 'outline'.

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

This sometimes proved a similar level of difficulty as 'explain' and for a similar reason. The candidate is required to give a detailed written account of the distinctive features but without any attempt to explain. Thus, when asked to describe how the ART tool is used, candidates would need to state that the task is first observed (or videoed); the assessor consults with those carrying out the task; each risk factor is rated and a number score is assigned to each upper limb movement. Scores are added to achieve an overall task score that is multiplied by the duration multiplier to give an exposure score. Finally the risk reduction measures are prioritised based on that exposure score.

Outline

Candidates had little difficulty with this command word, except in sometimes struggling with the difference between 'explain' and 'outline', as noted above.

Exhaustive descriptions were not required for 'outline' but limited answers like single words or listed answers did not satisfy the command word requirements.

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.

Identify

Candidates had no difficulty with this command word, except sometimes putting more information than was required.

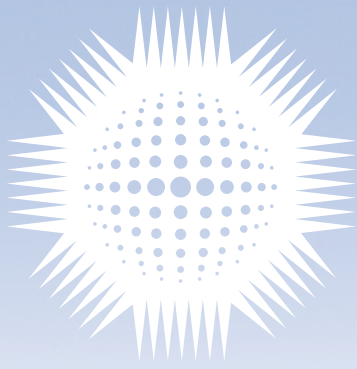
When providing a response to 'identify' the mental selection and naming of an answer that relates to the question should be sufficient. In most cases, one or two words would be sufficient to be awarded corresponding marks. Any further detail would not be required and impacts negatively on the time limit 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.

Conclusion

The feedback from Examiners highlighted that candidates taking the Unit IB examinations in July 2015 needed most improvement in the areas of ART tool (learning outcome 9.2); biological monitoring (learning outcome 4.3); lead (learning outcomes 1.3, 1.4 and 2.2); and malaria (learning outcome 5.2).

With regard to examination technique, candidates sitting this examination should avoid wasting time writing the question out. They should also not simply write down memorised answers to a previous, similar question that they think is there. Candidates should also pay attention to the command word and avoid repeating the same point in multiple ways (and instead broaden their answer to cover a wide range of issues).



nebosh

The National Examination
Board in Occupational
Safety and Health

Dominus Way
Meridian Business Park
Leicester LE19 1QW

telephone +44 (0)116 2634700

fax +44 (0)116 2824000

email info@nebosh.org.uk

www.nebosh.org.uk