Examiners' Report

NEBOSH CERTIFICATE IN ENVIRONMENTAL MANAGEMENT

UNIT EC1: MANAGEMENT AND CONTROL OF ENVIRONMENTAL HAZARDS

MARCH 2018

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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.

This report has been prepared to provide feedback on the standard date EC1 examination sat in March 2018.

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

Candidates and course providers will also benefit from use of the 'Guide to the NEBOSH Certificate in Environmental Management' which is available via the NEBOSH website. In particular, the guide sets out in detail the syllabus content for EC1 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 EC1 'Example question paper and Examiners' feedback on expected answers' which provides example questions and details Examiners' expectations and typical areas of underperformance.

Question 1   (a)   **Outline** reasons for producing a report on environmental performance.   **(6)**

(b)   **Identify** information that can be gathered to review environmental performance.   **(10)**

(c)   **Identify** different types of public reports produced by or about an organisation containing information on environmental performance.   **(4)**

This question assessed candidates' knowledge and understanding of learning outcome 2.2: Describe the key features and appropriate content of an effective EMS, ie ISO 14001:2015.

The main reason for a report on environmental performance is to demonstrate progress towards environmental goals. Better answers to part (a) gave both internal benefits such as informing decision making, as well as external motivations including public perception and, in some cases, regulatory compliance. Some candidates did not answer the question and instead gave answers about the content of reports.

Part (b) was generally well answered with examples such as the results of monitoring of emissions or usage of resources. Not all examples would apply to every workplace but in a general question like this candidates should consider possibilities for different types of organisation to gain good marks.

Answers to part (c) gave examples of external reports that might contain information about environmental performance. Some organisations produce specific sustainability reports, while others include the information in more general publications such as the Annual Report. The same information may also be published in reports by external bodies such as regulatory agencies. Few candidates identified a good range in their responses.

Question 2   (a)   **Identify** the main sources of noise from an industrial estate.   **(3)**

(b)   **Outline** how noise from an industrial estate could be prevented from interfering with neighbouring residents.   **(5)**

This question assessed candidates' knowledge and understanding of learning outcomes 8.1: Describe the potential sources of environmental noise and their consequences; and 8.2: Outline the methods available for the control of environmental noise.

Answers to both parts of this question were generally good, although part (a) specified the source as an industrial estate and some answers were too general. They should have included relevant sources of noise such as from industrial equipment or from the people on site.

Responses to part (b) included various controls, considering the source, pathway, and receptor. Maintenance of equipment, physical barriers and site management are all good examples.

Question 3   An organisation stores waste on site before it is collected for disposal elsewhere.

Outline measures that the organisation should take to reduce the risk to the environment from the waste during storage.   **(8)**

This question assessed candidates' knowledge and understanding of learning outcome 6.3: Outline how to manage waste.

Most candidates answered this question well with comments on preventing the waste from escaping, and segregation in suitable containers. Management tasks were less frequently mentioned but good housekeeping and supervision are important factors. A few candidates' answers were incorrect as they spoke about the waste hierarchy or details of emergency plans. As always, candidates are reminded to read and re-read questions carefully.

Question 4   (a)   **Give** the meaning of the term *'environmental impact'* as defined in ISO 14001.   **(2)**

(b)   **Outline** reasons for conducting an impact assessment as part of introducing an environmental management system (EMS).   **(6)**

This question assessed candidates' knowledge and understanding of learning outcome 3.1: Explain the reasons for carrying out environmental impact assessments.

The answer to part (a) is defined in ISO 14001. While word-perfect recall is not required, all the relevant parts of the definition need to be included to gain both available marks. It is important to understand the definitions of key terms as they are frequently asked about and often form the basis of other questions. Many candidates did provide an acceptable answer to part (a) but others showed that they had not learnt the meaning of this fundamental concept.

Part (b) was not well answered. Some candidates confused the impact assessment required for an EMS with a more formal Environmental Impact Assessment (EIA) which is carried out in a different context and with different purposes. When introducing an EMS, potential aspects and impacts from an organisation's activities need to be identified in order to develop the procedures required to manage these within the EMS. The impact assessment therefore forms the basis of putting controls in place and target setting.

Question 5   *Other than* fossil fuels, **identify FOUR** naturally occurring sources of energy **AND**, in **EACH** case, **outline** how energy is generated.   **(8)**

This question assessed candidates' knowledge and understanding of learning outcome 7.2: Outline alternative sources of energy and their benefits and limitations.

There were some excellent answers to this question with some candidates gaining full marks. Those candidates who did not gain good marks did not outline how energy is generated, or confused the generation processes from different sources (such as tidal and wave power).

Question 6 There is an increasing problem of land despoliation associated with the extraction of material resources.

(a) **Identify** the main causes of the problem. **(3)**

(b) **Outline** reasons for the increase in demand for resources. **(5)**

This question assessed candidates' knowledge and understanding of learning outcome 1.1: Outline the scope and nature of environmental management.

Many candidates did not answer this question well and some did not attempt it at all.

Good answers to part (a) include the causes of land despoliation such as the extraction of minerals or removal of timber, and the consequential damage from such practices. Many candidates' answers indicated that they were not at all familiar with the topic, even though it is an issue of global concern and often the cause of public protest.

Part (b) focused on the reasons for the increase in demand for resources such as an increasing population, with rising living standards, as well as the wasteful use of those resources. It is important that candidates appreciate the wider context of environmental management and its increasingly important role.

Question 7 (a) **Outline** what is meant by:

(i) groundwater; **(1)**

(ii) surface water. **(1)**

(b) **Outline** potential routes of contamination for:

(i) groundwater; **(3)**

(ii) surface water. **(3)**

This question assessed candidates' knowledge and understanding of learning outcomes 5.1: Outline the importance of the quality of water for life; and 5.2: Outline the main sources of water pollution.

This question provided a variable range of answers. In part (a) few candidates could provide the meaning of groundwater; water that is held underground in porous rocks or in soil. Surface water was generally well understood as, for example, held in rivers or lakes, although some candidates were not familiar with either term.

Those candidates who could not answer part (a) had difficulty with part (b). Pollution of groundwater has to find its way underground either by the source being underground – such as a leaking tank – or infiltration from a spill on the surface. Pollution of surface water can occur via run off from spillages on the surface, but there is also effluent discharge directly to watercourses. In both cases few candidates provided three routes for maximum marks.

Both parts of this question required an outline and some candidates did not give sufficient detail for full marks.

Question 8   **Explain** why an organisation should plan an effective response to environmental emergencies.   **(8)**

This question assessed candidates' knowledge and understanding of learning outcome 9.1: Explain why emergency preparedness and response is essential to protect the environment.

Many candidates did not answer the question and instead detailed what should be included in an emergency plan. Some candidates gave general reasons for why an organisation should have a plan, which were awarded marks, however, few candidates directly answered the question about the need for an *effective* response. This includes the general duty to protect the environment, but also recognises that internal and external business implications of an emergency can be minimised by a robust emergency response; such as loss of production, reputational damage, and clean-up costs.

Question 9   **Outline** the method of operation of the following air pollution control devices **AND give** an example of a type of pollutant that can be removed using **EACH** of them:

(a)   adsorption bed;   **(4)**

(b)   gravity separator.   **(4)**

This question assessed candidates' knowledge and understanding of learning outcome 4.3: Outline control measures that are available to reduce emissions.

The question stated that the control devices were for air pollution, but many candidates approached this question with answers about control devices for water pollution. The terminology used is similar but the devices are different and therefore marks could not be awarded for these answers.

The term 'adsorption' was not well understood. An adsorption bed typically uses activated carbon; pollutants are held on the surface (adsorbed) of the carbon as the air passes through the bed. This is usually used for organic pollutants, such as solvents, present as vapours in an air flow.

Gravity separators reduce an air flow's velocity, so that suspended solid contaminants simply fall under the influence of gravity and can be collected. They can be used for many fine but dense solids, such as mineral particles. Gravity separators are different from centrifugal separators, which some candidates described instead.

Where candidates seemed to be familiar with the terms used, they often did not sufficiently outline how these devices work in order to gain full marks. As a consequence this was the question with the lowest average mark. Candidates need to revise their understanding of the methods available for the control of air pollution and their modes of operation.

Question 10   **Outline** what could be considered when evaluating the significance of environmental impacts.   **(8)**

This question assessed candidates' knowledge and understanding of learning outcome 3.4: Explain the principles and practice of impact assessment.

The question focused on determining the significance of an environmental impact, once it has been identified. This is a key part of impact assessment as it informs the subsequent actions and controls that an organisation will need to implement. As in question 4, candidates needed to be clear on the meaning of 'environmental impact'.

Significance can depend on technical factors such as toxicity, the extent of the impact (global rather than local), or legal factors such as regulatory requirements. Likelihood of occurrence from the organisation's aspects is also an important factor. There is a long list of considerations but few candidates mentioned more than a couple.

Question 11   (a)   **Identify** pollutants emitted to atmosphere that are linked to climate change.   **(4)**

         (b)   **Outline** how consequences of climate change can affect wildlife.   **(4)**

This question assessed candidates' knowledge and understanding of learning outcomes 1.1: Outline the scope and nature of environmental management; and 3.2: Describe the types of environmental impact.

Most candidates gained good marks for answers to part (a) although some appeared to rely on listing all of the air pollutants that they knew. Carbon dioxide is a correct answer but carbon monoxide (or carbon oxides) is not. The differences between the two gases should be understood.

Answers to part (b) were more variable, especially for those who did not understand the question and answered generally about the consequences of climate change, rather than how it can affect wildlife. A good answer would link a consequence, such as rising sea levels, to the impacts on flora and fauna like loss of habitat. Polar bears were mentioned often, but the wider implications for other wildlife were missed or not detailed enough. For example 'loss of biodiversity' needed more explanation.

Examination technique

The following issues are consistently identified as the main areas in need of improvement for candidates taking the Environmental Certificate qualification:

Candidates misread/misinterpreted the question

Candidates misreading or misinterpreting the question is by far the most common cause of candidates not gaining the maximum marks available.

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 Certificate level qualifications relate directly to the learning outcomes contained within the associated syllabus guides. The learning outcomes require candidates to be sufficiently prepared to provide the relevant depth of answer across a broad range of subject areas. For example, a candidate could be asked about the causes of deforestation, or could be asked about the effects of deforestation. A question could require a response relating to the concept of water quality, or a question could require a response relating to the monitoring of water quality. Therefore, a candidate should focus not only on the general topic area (eg deforestation, water quality) but also the specific aspect of that subject to which the question relates.

Candidates must also pay attention to the command word. For example, a question could ask candidates to '**identify** types of waste found in an office', or a question on the same topic could ask candidates to '**outline** ways to manage waste from an office'. Candidates appear to focus solely on the object of the question (waste) and do not pay sufficient attention to the subject (waste types or waste management in the examples given) or the command word ('identify' or 'outline' in the examples given). There is often some confusion between aspects and impacts. If a question requires aspects of a given scenario, candidates must be careful not to provide impacts, or even in some circumstances controls, as they will not be able to attract marks.

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

Candidates are advised to allow sufficient time to read and re-read the question in order to determine the key requirements prior to committing their answer to paper. Preparing a time plan before the examination will indicate how many minutes are available for each question and then part of this time allocation can be given to reading the question. Underlining or highlighting key words can assist in keeping focused on the salient points and simple mind maps or answer plans can also be useful. Maps and plans should be kept simple so as not to use up too much examination time.

Candidates did not respond effectively to the command word

A key indicator a 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 and relates to the amount of detail that should be included in each point of the answer.

The learning outcomes in each element of all syllabus guides include the relevant command word that dictates the level of detail that should be covered in a course of study and the depth of answer that a candidate would be expected to provide in an answer to an examination question.

Examiners report that candidates continue to incorrectly observe the command words and therefore compromise their ability to gain the marks available. The majority of cases where command words are not observed relate to insufficient detail being given by a candidate in their examination answer. A significant number of candidates, irrespective of the command word given in the question, provide all answers in the form of a brief list of one or two words. This would normally not be sufficient to gain marks where the command word given was 'outline', 'explain' or 'describe', all of which require answers of more than one or two words.

Some candidates do provide too much information, which would not be required where a command word limits the expected answer to 'give' or 'identify'. Candidates would not be penalised for providing excessive detail but this would not be an efficient use of the time allocated.

Course providers should ensure that learning materials complement the command words in the syllabus guide and the NEBOSH guidance on command words and that sufficient time is given to advising candidates on suitable examination technique during a course of study.

Candidates unnecessarily wrote the question down

Developing a time plan is a key element in preparing for an examination. Advice included on Certificate question papers suggests that 30 minutes should be allocated for the answer to the long 20-mark question, and 90 minutes should be allocated to the answers for the remaining ten, 8-mark short questions. Therefore there are around 9 minutes available to answer an 8-mark question. This time will be required for reading the question properly at least twice, developing an answer plan, and then committing the answer to paper while regularly referring back to the question in order to maintain focus. Therefore any inefficient use of this time should be avoided.

The efficient use of this time is essential in order to ensure that all questions can be answered within the 2 hours available. Many candidates feel it necessary to write out the question, in full, prior to providing their answer and although this practice will not lose marks it will lose valuable time. A significant number of candidates do not answer all of the questions in the time permitted and do not complete the question paper, some of whom obviously run out of time.

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

It is clear that there are a significant number of candidates who seem to recite answers in the examination that have been rote-learned in advance and do not answer the question.

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

Candidates repeated the same points but in different ways / Candidates provided the same answer to different questions

There are instances where candidates repeat very similar points in their answers, sometimes a number of times. This is easily done in the stressful environment of the examination. However, once a point has been successfully made and a mark awarded for it, that mark cannot be awarded again for similar points made later in the answer.

Candidates are advised to practise examination technique in their preparations to avoid this kind of pitfall. Writing an answer plan where points can be ticked off when made, or structuring an answer so that each point made is clearly shown, for example by underlining key points, can be of great use. This technique aids candidates and makes it much clearer in the stress of the examination for candidates to see which points have been made and reduce the chances of the same point being made several times.

Candidates did not answer all of the questions

It has been noted that a number of candidates do not attempt all of the questions and of course where a candidate does not provide an answer to a question, no marks can be awarded. This seriously affects the potential marks available and the possibility of achieving a pass. Course providers must emphasise the importance of attempting all questions in order to maximise the opportunity to attract marks.

There can be several reasons for this issue: running out of the allocated time for the examination, not knowing the answer to the question, or forgetting to answer a question.

Questions can be answered in any order and answers can be written in any order in the answer book provided. Candidates are advised to clearly keep track of questions they have attempted, such as marking them on the question paper that would minimise the risk of inadvertently missing a question to answer.

If the subject of the question is unfamiliar or the answer is not known, then it will be challenging to provide an answer. This can result from rote-learning and preparing for an examination with a number of memorised answers, or simply not being adequately prepared for the examination across the breadth of the syllabus. There is always the risk of a candidate 'going blank' in an examination situation, in which case candidates should be prepared with some techniques to help. Rather than trying to remember what was taught or what has been read, ask yourself 'what would I do, in this situation?'. Reference to personal application or experience is sometimes enough to stimulate an answer that otherwise may have been missed. Alternatively, candidates can go back to first principles and break a question down into elements such as 'resources', 'inputs', 'outputs', and 'processes'. Approaching a question in small sections can minimise the risk of being overwhelmed by it as a whole.

Running out of time can be avoided by having an examination time plan and working to it. The question paper advises that you should spend 30 minutes on the long answer (question 1) and 90 minutes on the remaining ten short answer questions. This will provide around 9 minutes per short answer, follow the clock and when the time per question has expired, move on. Answering a question partly is better than not answering at all.

Candidates did not allocate enough time to the question / Time management

In a number of cases question 1 is left until last or later in the question paper and does not appear to be answered completely. Other candidates appear to rush the last one or two questions by providing very brief or bullet point answers, even when these questions require an outline. This indicates a lack of time management. It is advised that course providers and candidates spend time developing the skill of writing answers to questions bearing in mind the number of marks and time available. A 20-mark question requires significantly more detail than an 8-mark question.

Candidates might benefit from writing abbreviations to save time and to recognise that there is no need to write out the question at the beginning of their answer. Standard abbreviations such as ISO, EMS, NGO, and BPEO are acceptable.

Candidates' handwriting was illegible

Sometimes Examiners have difficulty in reading the handwriting of some candidates. Although allowances are made for candidates under the pressure of an examination, course providers must remind candidates that their writing needs to be legible or valuable marks may not be picked up during marking.

There is a minimum literacy requirement for candidates on NEBOSH qualifications. As stated in the syllabus guides the standard of English required by candidates studying for Certificate level must be such that they can both understand and articulate the concepts contained in the syllabus.

NEBOSH recommends to accredited course providers that candidates taking this qualification should reach a minimum standard of English equivalent to an International English Language Testing System score of 6.0 or higher in IELTS tests in order to be accepted onto a Certificate level programme.

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

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

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

Command words

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

Outline

The command word 'outline' is by far the most challenging for candidates. Referring to the NEBOSH guidance on command words available on the NEBOSH website, 'outline' means *"To indicate the principal features or different parts of"*.

Many candidates do not give sufficient detail in order to warrant an 'outline' answer. The NEBOSH guidance on command word states that *"an exhaustive description is not required. What is sought is a brief summary of the major aspects of whatever is stated in the question"*.

If the use of the command word in everyday language or conversation is considered it may help the candidate understand what is required. If asked to '**outline** things that should be in place when planning for emergencies' an answer such as 'materials, plans, inventory' would be insufficient as this represents a listed answer. However, 'materials to deal with spillages, access to site plans showing drainage points, and inventory of materials stored on-site' would be sufficient.

Explain

The command word 'explain' requires the candidate to provide an understanding of the subject of the question and will usually be used in conjunction with 'why' or 'how'. Such as '**explain** how a gravity separator operates' or '**explain** why biodiversity is important'.

Some candidates approach an 'explain' question the same as an 'outline' and provide a number of individual points rather than providing an explanation as to how something operates or why something occurs. While some candidates do answer such questions sufficiently and satisfactorily, other candidates have difficulty in explaining in a logical sequence and many repeat the same point.

Identify

'Identify' questions require the name or title of an item, such as, '**identify** renewable sources of energy' or '**identify** external sources of environmental information'. In most cases one or two words will be sufficient and further detail will not be required to gain the marks.

For example, if asked to '**identify** types of equipment found in an office' appropriate answers could be personal computer, printer, telephone, photocopier, etc. There would be no need to embellish those points with a description of the equipment or its function.

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

Describe

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 topic such that another person would be able to visualise what was being described.

If asked to describe the clock in the examination room, a person would have little difficulty in doing so and would most probably refer to its shape, its size, the colour of the clock and the style of numerals. Answers to such a question would almost certainly not result in general unconnected information about clocks, the history of clocks, or an explanation of why the clock is present in the room. Candidates should consider the general use of the command word when providing examination answers.

Give

'Give' questions require a statement that is relevant to the subject asked for in the question but additional explanation is not required. Often, 'give' questions ask for the meaning of a particular term. While detailed explanation of the application of the term would not be required, a correct knowledge of the term itself is needed in order for the Examiner to award marks.

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.