Examiners' Report

NEBOSH CERTIFICATE IN ENVIRONMENTAL MANAGEMENT

UNIT EC1: MANAGEMENT AND CONTROL OF ENVIRONMENTAL HAZARDS

SEPTEMBER 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.

This report has been prepared to provide feedback on standard date EC1 examination sat in September 2107.

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.

Unit EC1
Management and control of environmental hazards

Question 1   (a)   **Give** the meaning of the term *'environmental aspect'* as defined in ISO 14001.   **(2)**

A high-speed electric rail line is proposed to link major cities.

         (b)   **Outline** the main environmental aspects of this proposal:

               (i)   in the construction phase;   **(6)**

               (ii)   in the operational phase.   **(3)**

         (c)   **Outline** possible environmental impacts of this proposal:

               (i)   in the construction phase;   **(6)**

               (ii)   in the operational phase.   **(3)**

This question assessed candidates' knowledge and understanding of learning outcomes 3.1: Explain the reasons for carrying out environmental impact assessments; 3.2: Describe the types of environmental impact; and 3.4: Explain the principles and practice of impact assessment.

Despite a good definition of *'environmental aspect'* being given for part (a), many candidates confused aspects and impacts in part (b). There are no marks if the responses are under the wrong heading and it needs to be clear which are which. Aspects could include noise as well as the use of resources (such as materials). Relevant impacts relate directly to the aspects and so would include disturbance to neighbours and depletion of resources.

An 'outline' answer should provide some detail on each aspect or impact, relating it to the scenarios described in the question. Hardly any candidates mentioned positive impacts such as reduced air pollution from fewer vehicles on the roads, but such positive impacts are often the justification for schemes like this one.

Question 2   (a)   **Outline** benefits associated with the use of nuclear power.   **(4)**

         (b)   **Outline** limitations associated with the use of nuclear power.   **(4)**

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

There has been a lot of public interest in nuclear power which ought to have informed the answers to this question, but the marks did not reflect that. Some answers were better on the limitations, such as the issues around nuclear waste and public concerns about safety. The main benefits recognised were of nuclear power as an alternative to fossil fuels; reduced emissions of carbon dioxide and the comparative benefits in terms of global warming. However, technical benefits such as thermal efficiency also need to be recognised. The command word for this question was 'outline': many responses lacked the detail needed for marks to be awarded.

Question 3   A construction organisation is planning to build a new office block on a derelict factory site. The organisation's environmental policy commits it to minimising landfill disposal of its waste.

Outline practical measures that should be considered to enable the organisation to minimise landfill disposal of its waste. **(8)**

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

The marks on this question were generally low. The question asked for practical measures so no marks were awarded for management or organisational responses. Answers that would have gained good marks related to the early stages of the waste hierarchy: preventing and reducing waste by considering quantities of materials ordered and avoiding damage; as well as the reuse or recycling of waste from the demolition of the derelict structures. Again, the answers needed to be appropriate to the construction scenario so general points about office waste gained no marks.

Question 4   (a)   **Give** the meaning of the term *'safe drinking water'*. **(2)**

(b)   **Give** the meaning of the following water quality indicators:

(i)   chemical oxygen demand (COD); **(2)**

(ii)   biochemical oxygen demand (BOD); **(2)**

(iii)   total oxygen demand (TOD). **(2)**

This question assessed candidates' knowledge and understanding of learning outcomes 5.1: Outline the importance of the quality of water for life; and 5.3: Outline the main control measures that are available to reduce contamination of water sources.

Overall the marks for this question were low; responses to part (a) did not recognise that there are standards of water quality that must be met in order for water to be deemed 'safe' for consumption.

Candidates found part (b) even more challenging. There is no substitute for learning and understanding the three different terms, including the principles of measurement and situations for use. These indicators are widely used in the regulation and control of liquid wastes and environmental water quality. This needs to be taught and learnt but it seems that many answers were based on guesses.

Question 5   A pipe carrying oil from a storage tank to a boiler has developed a leak resulting in significant pollution to a large area of land.

(a)   **Outline** potential legal consequences for the organisation responsible for the leak. **(2)**

(b)   **Outline** potential financial consequences for the organisation responsible for the leak. **(6)**

This question assessed candidates' knowledge and understanding of learning outcomes 1.2: Explain the ethical, legal and financial reasons for maintaining and promoting environmental management; and 1.4: Explain the role of national governments and international bodies in formulating a framework for the regulation of environmental management.

This question was better answered although a few candidates confused legal and financial consequences. The available marks indicate that the answer to part (b) should be longer than part (a). The legal consequences revolve around prosecution and regulatory actions. The financial consequences can include direct costs, such as for clean-up, as well as indirect impacts such as a loss of business following reputational damage.

Question 6 (a) **Identify** atmospheric pollutants that could be released from the following sources:

   (i) a paint-spraying process; **(2)**

   (ii) a diesel-fuelled forklift truck. **(2)**

(b) **Outline** the control hierachy for reducing air pollution. **(4)**

This question assessed candidates' knowledge and understanding of learning outcomes 4.2: Outline the main types of emissions to atmosphere and the associated hazards; and 4.3: Outline control measures that are available to reduce emissions.

This question gained the best overall marks on the paper. The responses to part (a) were generally good with the main pollutants being correctly identified. Candidates and course providers should note that gaseous emissions of carbon oxides and nitrogen oxides need to be properly described: using the terms 'carbon' and 'nitrogen emissions' does not suffice.

To get full marks in part (b) it was necessary to outline the three main steps in the hierarchy – not just name them – and give them in the correct order.

Question 7 An organisation needs to obtain a permit that sets emission limit values before allowing any releases to a surface water stream.

In order to help ensure compliance with the emission limit values, **outline** measures that need to be put in place for:

(a) active monitoring; **(6)**

(b) reactive monitoring. **(2)**

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.

This was another question that was not well answered. Active monitoring of emissions was generally recognised, but few candidates outlined the active monitoring measures such as flow measurement of releases.

Responses to part (b) recognised reactive monitoring of incidents or near misses. Again, candidates missed marks by not giving sufficient information for an 'outline' answer.

Question 8	**Explain** what is meant by *'best practicable environmental option'* (BPEO).	**(8)**

This question assessed candidates' knowledge and understanding of learning outcome 1.4: Explain the role of national governments and international bodies in formulating a framework for the regulation of environmental management.

This question was one of the two with the lowest marks as few candidates seemed to know the term *'best practicable environmental option'*. This can only be learnt and understood, although the terminology ought to give some clues.

The adoption of BPEO aims to result in the best overall protection of the environment, by considering short and long term impacts. The term 'BPEO' is typically used as part of a decision making process and marks were available for referring to the context of its use, as well as explaining the considerations applied.

Question 9	An organisation has an emergency plan to deal with a range of emergencies including fire, explosion, chemical spillage and flooding.	
	Outline practical measures that should be taken to help ensure that the plan would work effectively if required.	**(8)**

This question assessed candidates' knowledge and understanding of learning outcome 9.2: Describe the measures that need to be in place when planning for emergencies.

This question on emergency planning was reasonably well answered. Those candidates who gained low marks often did not answer the question asked, which was about the practical measures required to ensure that the plan would actually work. Therefore, responses that detailed the plan's content did not gain marks. Suitable responses referred to things such as training of employees, ensuring that emergency kit detailed in the plan is in place and suitable for use, and that information in the plan is up-to-date.

Question 10	(a)	**Give** the meaning of the term *'environmental audit'*.	**(2)**
	(b)	**Outline** *pre-audit* preparations that may be needed for an environmental audit.	**(6)**

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 average mark was low for this question. Candidates generally answered part (a) well, giving the meaning of the term *'environmental audit'* as a systematic examination of an organisation's environmental management system and briefly expanding on this.

Some candidates were not awarded marks for part (b) as they outlined the contents of an audit rather than the pre-audit preparations asked for. Good answers began by agreeing the scope of the audit and appointing suitable people to conduct it. Building on this with further detail of practical preparations would have resulted in better marks. Again, some candidates did not give an adequate 'outline' of their response and so could not be awarded full marks.

Question 11   A construction project is planned near to a residential area and a local school. Residents and teachers are concerned about the possible noise that will be emitted from the construction site.

Outline *management* controls that could reduce the impacts of noise emitted from the construction site.   **(8)**

This question assessed candidates' knowledge and understanding of learning outcome 8.2: Outline the methods available for the control of environmental noise.

This was another example of some candidates being unable to give an 'outline' answer, as well as not answering the question asked, resulting in a low average mark. The question asked specifically for management controls, rather than operational measures. Planning of work patterns and management of behaviour on-site are examples of the controls which would have gained marks.

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 in 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.