
Examiners' Report

NEBOSH CERTIFICATE IN ENVIRONMENTAL MANAGEMENT

UNIT EC1: MANAGEMENT AND CONTROL OF ENVIRONMENTAL HAZARDS

MARCH 2020



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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 learners annually and are offered by over 600 Learning Partners, with examinations taken in over 120 countries around the world. Our qualifications are recognised by the relevant professional membership bodies including the Institution of Occupational Safety and Health (IOSH) and the International Institute of Risk and Safety Management (IIRSM).

NEBOSH is an awarding body that applies best practice setting, assessment and marking and applies to Scottish Qualifications Authority (SQA) Accreditation regulatory requirements.

This report provides guidance for learners and Learning Partners for use in preparation for future examinations. It is intended to be constructive and informative and to promote better understanding of the syllabus content and the application of assessment criteria.

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General comments

Many learners are well prepared for this unit assessment and provide comprehensive and relevant answers in response to the demands of the question paper. This includes the ability to demonstrate understanding of knowledge by applying it to workplace situations.

There are other learners, however, who appear to be unprepared for the unit assessment and who show both a lack of knowledge of the syllabus content and a lack of understanding of how key concepts should be applied to workplace situations.

This report has been prepared to provide feedback on the standard date EC1 examination sat in March 2020.

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

Learners and Learning Partners will also benefit from use of the 'Guide to the NEBOSH 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.

Unit EC1 Management and control of environmental hazards

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- Question 1**
- (a) **Identify** the categories of waste. (4)
- (b) (i) **Outline** the main advantages associated with the landfilling of waste. (8)
- (ii) **Outline** the main disadvantages associated with the landfilling of waste. (8)
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This question assessed learners' knowledge and understanding of learning outcomes 6.4: Describe outlets available for waste; and 6.1: Outline the significance of different waste categories and the relationship between category and route of disposal.

The definitions of the waste categories are universal with a few local variations. The categories of hazardous and non-hazardous would be readily known but it is a case of learning them all. In part (a) most learners were able to identify these.

However, many learners found part (b) challenging.

While emphasis in recent years has been on the re-use and recycling of waste, landfill is still used world-wide in most countries for various reasons. Among these are the advantages that it has over the alternatives and learners needed to outline these in part (b) (i). In many cases it is the cheapest and simplest option, especially if suitable land is available nearby and not expensive. Some waste residues from other forms of treatment can only be safely disposed of this way and sites can be restored to beneficial use at the end of their lives.

For part (ii), some of the disadvantages can be the opposite of the advantages. Land may be unavailable or too expensive or too far away. However, there are other disadvantages that are less apparent; for example, landfill sites that are badly managed are often a source of pollution to air, water and land and can cause nuisance in other ways.

Learners need to read around the topic and be able to understand the relative advantages and disadvantages as they can be specific for any location.

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- Question 2**
- A pipe carrying oil from a storage tank to a boiler has developed a leak resulting in significant pollution to several kilometres of a large water course.
- (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 learners' knowledge and understanding of learning outcomes 1.2: 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.

Both parts of this question were generally well answered.

For part (a) the main risk is prosecution or other legal sanction.

There is increasing evidence of exceedance of air quality standards in areas subject to heavy traffic causing health problems and this leads to some of the answer to part (b). Exhaust gases from predominantly diesel engines contain two pollutants of particular concern that need control (by traffic measures or by exhaust gas treatment). Learners could use these in their answer to gain marks. Another historic example is the legislation to remove lead from petrol completely as it was damaging the development of young children.

Question 6 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 learners' knowledge and understanding of learning outcome 8.2: Outline the methods available for the control of environmental noise.

Some learners appeared to misread the question. It asked for *management* controls so operational controls were not relevant and would not be awarded marks. Management is responsible for planning, organising, scheduling and controlling operational activities. So this would include such issues as site layout to minimise noise nuisance, selection of plant and tools, staff behaviour and the timing of activities such as traffic movements.

Learners need to read and re-read the question carefully to help ensure they understand what is required. If learners plan their answers first, the time to re-read the question is just before committing the answer plan to paper.

Question 7 Environmental risk is often assessed using the 'source-pathway-receptor' model.

- (a) (i) **Give** the meaning of the term '*receptor*'. **(1)**
- (ii) **Identify** typical receptors. **(4)**
- (b) **Give THREE** different examples illustrating the 'source-pathway-receptor' model. **(3)**
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This question assessed learners' knowledge and understanding of learning outcome 3.4: Explain the principles and practice of impact assessment.

This question stressed the importance of the source-pathway-receptor model in environmental impact assessment. The question was generally well answered but some answers to part (a) were too brief to gain good marks.

In part (a) (i) the meaning of the term '*receptor*' should be described in a few words; the usual basic definition is that the element of the environment that is at risk from the source.

In part (a) (ii) receptors must be at risk so they are those elements of the environment that are susceptible to toxicity or the effects of pollution such as flora or groundwater.

In part (b) the pathway is the means by which the potential threat moves from the source to the receptor. A pathway could be leachate from contaminated land (source), surface water drainage into stream (pathway) and fish (receptor). Answers need to be clear on which is the source, the pathway and the receptor as there can be overlap. This is best displayed in a simple table of three columns with a heading for each so that it is clear.

Question 8	(a)	Outline benefits of using solar photovoltaic cells to generate electricity.	(4)
	(b)	Outline limitations of using solar photovoltaic cells to generate electricity.	(4)

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

This question is topical and was generally answered satisfactorily, although few learners gained full marks.

In part (a) the main driver behind all forms of renewable energy is that they do not produce harmful emissions of gases such as carbon dioxide. Solar photovoltaic cells fall into this category. Other benefits include that they are also reducing in cost to buy and install, and once in place need little attention.

Limitations were required in part (b). The principle one is that they rely on natural light to generate electricity and so do not work at night and have reduced output on short-daylight or cloudy days. The other limitations are often well-publicised in news reports on the topic.

Question 9	Outline circumstances that would require an environmental policy to be reviewed.	(8)
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This question assessed learners' knowledge and understanding of learning outcome 2.2: Describe the key features and appropriate content of an effective EMS, ie ISO 14001:2015.

Few learners gained high marks for this question and some learners were not awarded more than a couple of marks.

ISO 14001:2015 is behind much of the syllabus content and should be understood in its own right, but also its relevance to other elements of the syllabus. The requirements for review are often triggered by a change in some aspect of the business which was in place when the EMS was initially prepared. This would include changes in relevant legislation and standards or in processes carried out on site. There are other changes in the organisation or impacts from events that should also trigger reviews. Loss of accreditation is often a consequence of some event that could have been avoided and ensuring that the EMS is always relevant helps.

Learners should always have the EMS in mind when studying the other topics, thinking about how it relates to the topic and how it will require review in the future if something changes.

Examination technique

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

Learners misread/misinterpreted the question

Learners misreading or misinterpreting the question is by far the most common cause of learners 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 learners to be sufficiently prepared to provide the relevant depth of answer across a broad range of subject areas. For example, a learner 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 learner 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.

Learners must also pay attention to the command word. For example, a question could ask learners to '**identify** types of waste found in an office', or a question on the same topic could ask learners to '**outline** ways to manage waste from an office'. Learners 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, learners 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 learners do begin their answer satisfactorily and perhaps gain one or two marks, they then lose sight of the question and include irrelevant information. Although further points included in an answer can relate to the general subject area, these points are not focused on the specific learning outcome and marks cannot be awarded. However, some learners appear to misread or misinterpret several questions. This situation is more likely due to learners preparing for the examination with a number of 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.

Learners 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.

Learners 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 learner 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 learner would be expected to provide in an answer to an examination question.

Examiners report that learners 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 learner in their examination answer. A significant number of learners, 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 learners do provide too much information, which would not be required where a command word limits the expected answer to 'give' or 'identify'. Learners would not be penalised for providing excessive detail but this would not be an efficient use of the time allocated.

Learning Partners 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 learners on suitable examination technique during a course of study.

Learners 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 learners 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 learners 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.

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

It is clear that there are a significant number of learners 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 learner's **understanding** of the subject and reciting a pre-prepared and memorised answer will not show a learner's understanding. In fact, if a learner gives a memorised answer to a question that may look similar, but actually is asking for a different aspect of a topic in the syllabus, it shows a lack of understanding of the subject and will inevitably result in low marks being awarded for that answer.

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

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

Learners 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 learners and makes it much clearer in the stress of the examination for learners to see which points have been made and reduce the chances of the same point being made several times.

Learners did not answer all of the questions

It has been noted that a number of learners do not attempt all of the questions and of course where a learner 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. Learning Partners 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. Learners 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 learner 'going blank' in an examination situation, in which case learners 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, learners 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.

Learners 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 learners 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 Learning Partners and learners 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.

Learners 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.

Learners' handwriting was illegible

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

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

NEBOSH recommends to Learning Partners that learners 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>

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

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

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 learners. 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 learners 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 learner 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 learner 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 learners 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 learners do answer such questions sufficiently and satisfactorily, other learners 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 learners feel obliged to expand 'identify' answers into too much detail, with the possible perception that more words equals more marks. This is not the case and Learning Partners should use the NEBOSH guidance on command words within their examination preparation sessions in order to prepare learners for the command words that may arise.

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. Learners 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: <https://www.nebosh.org.uk/i-am/a-learner/> - from this page the document can be found by clicking on the relevant Qualification link, then on the 'Resources' tab.