January 2012

Examiners' Report

NEBOSH National Diploma in Occupational Health and Safety (Unit C)

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NEBOSH NATIONAL DIPLOMA IN OCCUPATIONAL HEALTH AND SAFETY

Unit C: Workplace and work equipment

JANUARY 2012

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

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 over 25,000 candidates annually and are offered by over 400 course providers in 65 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 to be recognised and regulated by the UK regulatory authorities.

Where appropriate, NEBOSH follows the latest version of the *"GCSE, GCE, Principal Learning and Project Code of Practice"* published by the regulatory authorities in relation to examination setting and marking (available at the Ofqual website www.ofqual.gov.uk). While not obliged to adhere to this code, NEBOSH regards it as best practice to do so.

Candidates' scripts are marked by a team of Examiners appointed by NEBOSH on the basis of their qualifications and experience. The standard of the qualification is determined by NEBOSH, which is overseen by the NEBOSH Council comprising nominees from, amongst others, the Health and Safety Executive (HSE), the Confederation of British Industry (CBI), the Trades Union Congress (TUC) and the Institution of Occupational Safety and Health (IOSH). Representatives of course providers, from both the public and private sectors, are elected to the NEBOSH Council.

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

Any enquiries about this report publication should be addressed to:

NEBOSH
Dominus Way
Meridian Business Park
Leicester
LE19 1QW

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

General comments

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

There are always some 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.

In order to meet the pass standard for this assessment, acquisition of knowledge and understanding across the syllabus are prerequisites. However, candidates need to demonstrate their knowledge and understanding in answering the questions set. Referral of candidates in this unit is invariably because they are unable to write a full, well-informed answer to one or more of the questions asked.

Some candidates find it difficult to relate their learning to the questions and as a result offer responses reliant on recalled knowledge and conjecture and fail to demonstrate a sufficient degree of understanding. Candidates should prepare themselves for this vocational examination by ensuring their understanding, not rote-learning pre-prepared answers.

Common pitfalls

It is recognised that many candidates are well prepared for their assessments. However, recurrent issues, as outlined below, continue to prevent some candidates reaching their full potential in the assessment.

- Many candidates fail to apply the basic principles of examination technique and for some candidates this means the difference between a pass and a referral.
- In some instances, candidates do not attempt all the required questions or are failing to provide complete answers. Candidates are advised to always attempt an answer to a compulsory question, even when the mind goes blank. Applying basic health and safety management principles can generate credit worthy points.
- Some candidates fail to answer the question set and instead provide information that may be relevant to the topic but is irrelevant to the question and cannot therefore be awarded marks.
- Many candidates fail to apply the command words (also known as action verbs, eg describe, outline, etc). Command words are the instructions that guide the candidate on the depth of answer required. If, for instance, a question asks the candidate to ‘describe’ something, then few marks will be awarded to an answer that is an outline. Similarly the command word ‘identify’ requires more information than a ‘list’.
- Some candidates fail to separate their answers into the different sub-sections of the questions. These candidates could gain marks for the different sections if they clearly indicated which part of the question they were answering (by using the numbering from the question in their answer, for example). Structuring their answers to address the different parts of the question can also help in logically drawing out the points to be made in response.
- Candidates need to plan their time effectively. Some candidates fail to make good use of their time and give excessive detail in some answers leaving insufficient time to address all of the questions.
- Candidates should also be aware that Examiners cannot award marks if handwriting is illegible.
- Candidates should note that it is not necessary to start a new page in their answer booklet for each section of a question.

UNIT C – Workplace and work equipment

Section A – *all questions compulsory*

Question 1 ***Outline*** *factors to be considered when developing a planned preventive maintenance programme for safety-critical machinery.* ***(10)***

In answering this question, candidates should have referred to factors such as the manufacturer's recommendations and servicing and insurer's requirements; the reliability of critical components using diagnostic techniques to predict failure, the effect failure would have on other components and on the process in general and the need to plan their replacement before failure occurs which would require the storage of spare components; the risks to health and safety of malfunction; the age and current condition of the machinery and its usage, breakdown history and operating environment whether in dusty areas, in high temperatures or in corrosive atmospheres. Additional factors to be considered would include the timing of the maintenance for example at weekends to prevent disruption to production; the methods to be used to identify maintenance periods such as the use of coloured tags and for recording the maintenance once completed; and the competence of existing maintenance staff with the possibility that additional specialist training might be required. Finally, marks were available to those candidates who referred to the requirements of legislation such as those contained in the HSW Act, the Electricity at Work Regulations and PUWER.

Some candidates did not pay sufficient attention to the wording of the question and concentrated on how the maintenance work would be carried out rather than the factors that should be considered in the development of a programme. Some concentrated on how maintenance would be carried out safely such as by introducing the use of a permit to work system. When the subject of the question was correctly addressed little was offered apart from the age of the machine, manufacturers' recommendations, the amount of usage and the competence of the maintenance staff. The reference to safety critical machinery was often ignored and few mentioned the requirements of the relevant legislation.

Question 2 *A manually operated lathe is to be fitted with a Computer Numeric Control (CNC) system.*

***Outline**:*

(a) *additional hazards this may introduce;* ***(4)***

(b) *measures required to minimise the risks associated with these hazards.* ***(6)***

The fitting of a computer numeric control to a manually operated lathe would introduce additional risks such as an increase in the speed of the machine and the potential rise in noise levels that could accompany this increase; the possibility of unexpected movements or aberrant behaviour; errors in programming and software; risks arising during setting and teaching operations together with those arising from the operators' unfamiliarity with the system.

Measures that would be required to minimise the risks include the completion of a risk assessment for the new system; the provision of fixed or interlocked guards to prevent access during the automatic cycle; the provision of manual operation for setting and cleaning such as a hold to run system; the relocation of the controls outside the danger zone; the provision of additional training for operators and maintenance staff; updating the instruction manual for using, setting, cleaning and maintaining the machine and carrying out regular testing of the software and screening for RF interference.

This was a poorly answered question with some candidates appearing to have little knowledge of a CNC system with some confusing it with robotics. Many appeared to ignore the word 'additional' and outlined the hazards associated with the normal operation of the lathe rather than those associated with the CNC system and could offer only the provision of guarding without further detail and the use of competent operators.

Question 3 *A diesel engine is being used to power a machine in a potentially flammable atmosphere.*

(a) ***Identify** sources of ignition associated with the diesel engine.* ***(4)***

(b) ***Outline** the protection that should be applied to the diesel engine to minimise the risk of an explosion.* ***(6)***

In the first part of the question, candidates were asked to identify possible sources of ignition from the diesel engine. They should have referred to flames or sparks from the exhaust and inlet systems, sparks arising from the engine's electrical system, through over speeding or overloading of the engine, impact sparks from the cooling fan and as a result of friction. It seemed that many candidates, perhaps aware of past examination papers, considered that this question referred to a diesel powered forklift truck. There was some confusion concerning the sources of ignition with some suggestion that diesel was the ignition source while there were a few references to the existence of a spark plug.

Part (b) required an outline of the protection that should be applied to the diesel engine to minimise the risk of explosion. An initial protection measure would be the fitting of flame and spark arrestors to prevent flashback to atmosphere if flammable vapour was drawn into the inlet system and to prevent any flames from the exhaust system escaping into the outside atmosphere. The engine and exhaust system should be designed to ensure that their surface temperatures were below the ignition temperature of any flammable substances and the use of a water jacket on the exhaust system would provide additional protection as would the use of thermal sensors together with air cooling for hotspots. Electrical equipment should be suitable for zones 1 and 2 and mechanical alternatives (eg fuel gauge) should be fitted where possible. Engine cooling fans should be made from plastic, care taken to ensure that there was adequate clearance between fixed and rotating parts of the engine and a gas detecting device fitted which should be linked to an automatic cut-off.

Answers to this part of the question were limited with minimum reference being made to relevant methods of protection. There were the occasional suggestions that the flammable atmosphere should be removed or that inert gases should be pumped into the engine.

Question 4

(a) ***Outline*** *the principles of a boiling liquid expanding vapour explosion (BLEVE)* ***AND give*** *examples of actual incidents to support your answer.* ***(8)***

(b) ***Outline*** *the effects of a BLEVE.* ***(2)***

The key issues that needed outlining included the storage of a liquid under pressure in a vessel; the presence of an external heat source; an increase in pressure resulting in the opening of the relief valve and the expulsion and ignition of vapour and lowering of the liquid level in the vessel; the rising temperature of the remaining liquid and gas in the vessel and particularly of the vessel wall above the liquid level; the development of overpressure and the rupture of the vessel resulting in a drop in pressure and the emission of boiling liquid and vapour which is then ignited by the external heat source. Relevant examples could have included the BLEVE at San Carlos de la Rapita in 1978 at a campsite in Spain, the Mexico City incident in 1984 and that involving LPG cylinders in general in Palermo in 1996. There was a varied response to this part of the question with some candidates showing little understanding of the principles of a BLEVE. Some confused a BLEVE with a vapour cloud explosion quoting Flixborough as an example while others quoted a range of incidents that were unrelated.

The effects of a BLEVE include the rapid spread of boiling liquid and vapour resulting in a fireball producing substantial thermal radiation; debris and missiles projected from the vessel and the possibility of a shockwave. Many answers to this part of the question lacked the detail to satisfy an ‘outline’ and a bald statement that escaping energy from a BLEVE can have devastating effects, whilst true was not sufficient to gain the marks available.

Question 5 ***Outline*** *the characteristic features of, and factors that promote, the following types of materials failure:*

(a) brittle fracture; ***(5)***

(b) ductile failure. ***(5)***

For this question, candidates were expected to outline the characteristic features of and factors that promote brittle and ductile fractures. A brittle fracture generally occurs without warning or prior evidence of distress. It is a crystalline structure failure with minimal plastic or elastic deformation. There are generally characteristic "chevron" marks from the point of initiation and the failure is sudden from rapid stress loading. The factors promoting a brittle fracture are high tensile stresses, residual or built in stresses, sudden loading which does not give the material time to deform plastically, case hardening, low temperatures and the degree of brittleness of the material.

A ductile fracture generally has a smooth fracture surface with plastic deformation of the material before final fracture. There is evidence of necking and the final fracture is often brittle because there is insufficient material left to sustain a load. This type of failure generally occurs as the result of a single stress overload although other promoting factors include high temperatures, cold work hardening and the plasticity of the material.

Answers to this question were generally limited. Some candidates did refer to temperature or load as promoting factors but neglected to add a defining term such as for example 'high' or 'low' as far as temperature was concerned. There were a few candidates who considered the molecular theory of metals but this was not particularly relevant to the question asked.

Question 6 *A company intends to build a flammable solvent distribution facility as part of its chemical manufacturing premises. The facility will include three 40,000 litre storage tanks that are pump filled via pipelines from batch reactors. The storage tanks supply an outdoor road tanker filling system as well as a small container filling facility located inside a warehouse.*

Outline *the design features that should be adopted to prevent or minimise leakage and spills from the proposed installation.* ***(10)***

Design features to be adopted include ensuring the pipework is of all weld construction with the minimum number of flanges with a suitably corrosion resistant material used in its construction. The pipework should be routed along a containment trench or should be double skinned and further protected by robust barriers at vulnerable points near to roads or railways. The storage tanks should be in a bunded area capable of containing 110% of the contents of all three tanks with the base and walls of the bund being impervious and free from breaches for services. The tanks should be fitted with high level detectors interlocked with a pump cut out with the pumps themselves being situated within bunds with interceptor facility. The road tanker stands should be located in an intercepted shallow bund with snap shut connections on the tanker filling lines. In the warehouse the small keg filling lance should be fitted with a dead man's handle together with a supply cut out when the expected weight is registered on a load cell. Finally all valves in the installation should be designed to prevent leaks such as for example with a double mechanical seal with means for preventing them being left in a partially open state.

The standard of answers provided for this question was not to an acceptable standard. Some candidates concentrated only on the subjects of maintenance, fire precautions, training and good housekeeping with regard to cleaning up any spills that might occur but did not discuss technical design features that should be adopted to prevent or minimise leakage and spills. Of those who did address the subject, many supplied only generic answers referring to features such as the provision of safety monitoring systems and automatic shutdowns without detailing what these entailed such as level detectors interlocked with pumps and emergency shut-down valves.

Section B – *three from five questions to be attempted*

Question 7 *A three-storey building is situated with one side fronting on to a pedestrian walkway. The building is to undergo extensive maintenance to the external fabric which includes a sloping roof.*

***Outline**:*

(a) *the health and safety issues of the work that will need to be considered before work starts;* ***(11)***

(b) *the features of a scaffold designed to provide a safe place of work for working at height during the maintenance activity.* ***(9)***

The issues raised in this question relate to the safe management of construction work in an area where the public has access and are concerned with public safety such as the provision of barriers and screening to ensure protection from plant and falling materials; working at height requiring precautions to be taken to prevent falls and to ensure safe access for materials; and the introduction of safe systems of work for operations such as sand blasting and water jetting. As such for part (a) candidates were expected to outline issues such as the requirements for suitable plant and equipment including roof ladders bearing in mind the requirements of the Working at Height Regulations; the provision of access for vehicles and the arrangements for the movement and storage of materials on site; the security of the site and the need to ensure the safety of the building's occupants if they are to remain whilst the work is completed; the likely presence of any hazardous materials such as lead and/or asbestos and those likely to be flammable; the need to consult any existing health and safety files or structural surveys which have been completed; the proximity of any utility supplies and the effect that the proposed work may have on neighbouring buildings; possible health issues arising from exposure to the sun or inclement weather or to dust from bird or animal droppings; the provision of personal protective equipment such as hard hats, eye protection and fall arrest equipment such as harnesses and the provision of adequate welfare facilities.

For part (b), candidates should have outlined features such as the correct erection of the scaffold, for example, ensuring the use of upright standards positioned on base plates on stable level ground, horizontal ledgers and tight couplers with adequate bracing and guard rails and the need to tie it into the structure; ensuring the working platforms were wide enough, fully boarded and provided with safe access; minimising or plugging the gap between the scaffold and the wall of the building; the provision of a special working platform below the eaves; protecting the scaffold at its base from impact by vehicles; and using a chute for the disposal of waste materials.

This was a popular question and in general answers provided were to a reasonable standard. For part (a) most of the relevant issues were outlined although reference to the safety of occupants and the proximity to utility supplies was often omitted. Some candidates did have difficulty in answering part (b) since they did not seem to have knowledge of the various components of a scaffold and how they should be put together in a safe manner. Those who did generally provided acceptable answers although only a few candidates referred to the provision of the special platform below the eaves and the need to plug or minimise the gap between the building and the scaffold.

Question 8 *Construction work is to take place in a rural area where electrical power for the site is to be gained from an existing 11kV overhead supply that cuts across the site on wooden poles.*

***Outline** control measures that should be taken to reduce risks associated with the:*

(a) overhead supply; ***(8)***

(b) provision and use of electricity on the site. ***(12)***

The first part of this question was concerned with the control measures to be taken when undertaking work near an overhead electrical supply and so was seeking a description of the key elements described in HSE Guidance Note GS6. Good answers began by considering the possibility of re-routeing the lines and pointing out that, before any actions were recommended by way of protective measures, the utility supplier would need to be consulted. Answers should then have described the usual control measures including identification of safety distances; the use of barriers, marking tape and bunting; the use of goal posts and tunnels where access routes pass under the power lines; height restrictions on plant; the introduction of safe systems for working near to power lines; a restriction on the storage of materials within six metres of the overhead lines; the prohibition of using hand-held long metal equipment such as ladders; the erection of warning signs and the provision of training and information to the workforce on the precautionary measures that should be taken. A number of candidates considered that the work was concerned with the erection of an overhead supply line and discussed precautions that should be taken for work at height and in the use of MEWPs. Limited reference was made to GS6.

Part (b) was directed at the safe use of electricity on the site and was seeking an outline of the key precautions set out in guidance such as HSG 141 “Electrical safety on construction sites.” Issues that are relevant include planning and assessment for the development of the electricity supply by a competent person; the suitable connection and positioning of step-down transformers; the routeing, marking and protection of cables; the use of protective measures such as reduced low voltage systems, residual current devices and double insulated equipment; arrangements for the regular inspection and testing of the fixed supply including the integrity of the earthing of the system; exercising control on the equipment brought on to the site including portable items and the use of competent persons for the installation of and work on the electrical supply.

Although several candidates demonstrated a good understanding of the precautions to be taken to reduce risks from the use of electricity in an aggressive environment answers to this part of the question were not to the same standard as those provided for part (a). A few candidates did not seem to be aware of the basic safety issues involved and the control measures that should be applied while some concentrated on the use of electrical equipment on site such as power tools instead of on the installation and maintenance of an electrical system.

Question 9 *An insulated chemical reactor vessel has become coated internally with a sticky by-product of a chemical reaction which is interfering with the efficiency of the process. It is decided that the reactor must be cleaned of the material. The substance in question becomes liquid and mobile at 60°C. However, it decomposes exothermically at 95°C reacting with the oxygen content of air. The vessel which was an 8m long cylinder of 2m diameter, was laid on its side, adjacent to its usual plant location to facilitate entry for cleaning via a hatchway in the base. As warm water proved to be a very slow cleaning medium it was decided to use steam cleaning delivered by hand-held lances and rake out the softened material with metal rakes. Shortly after commencing the steam cleaning the operatives involved heard a rumbling and noticed a blue flame on the surface of the reactor wall. They evacuated the vessel and had just done so when a jet of flame was emitted from the hatchway which travelled 30m to the wall of the company office building and continued playing on it for 2 minutes. The resultant fire in the office building caused multiple fatalities.*

(a) ***Describe*** *the nature of the combustion reaction involved in generating the incident.* ***(5)***

(*b)* ***Outline*** *the technical and operational failings that could account for the conditions which led to the incident and the resultant fatalities.* ***(8)***

(c) ***Outline*** *the controls necessary in such installations to prevent repetition in similar circumstances.* ***(7)***

This was not a popular question and few attempted to provide an answer. Candidates should have described the combustion as an exothermic runaway reaction as a result of the presence of a reactive chemical which was heated to decomposition and then reacted with oxygen in the air. The insulation of the vessel together with the bulk of the liquid formed would cause a build-up of heat and a rapid rise in the reaction rate. The gases evolved would have been ignited by a source whether smoking materials, electrical switching or spontaneous ignition with the resultant reaction having sufficient energy to produce a jet of flame. Candidates generally identified the exothermic runaway reaction but little else. There were few who mentioned the rapid rise in reaction rate or that the reaction did not cause an explosion although some considered that it did.

For part (b), candidates should have recognised that an adequate risk assessment had not been completed prior to the operation which led to a number of failures such as to analyse the by-product; to recognise the possibility of an exothermic reaction; to understand the nature of the decomposition products such as flammable gas; and to appreciate the effect of applying steam at 100°C. There was a failure at the design stage to anticipate the cleaning requirements so that a larger number of cleaning access points was not provided for the reactor. The use of metal rakes could have produced sparking while the lack of effective supervision was a likely cause for the abandonment of warm water cleaning. A permit to work system should have been put in place for the cleaning operation and as a consequence of failing to do take this action, there was no control of ignition sources or provision of flammable gas monitoring equipment. Candidates were normally able to offer only the failure to introduce a permit to work system and to analyse the residue before cleaning operation began.

Control measures which might be adopted to prevent a repetition include the removal of the vessel from site to a remote quarantined cleaning location. Should this not be possible, then other measures should be adopted such as the removal of the vessel insulation prior to cleaning; the use of an appropriate solvent for cleaning at ambient temperatures; introducing forced ventilation into the vessel to ensure any gases were kept below the lower explosive limit; introducing a permit to work system to control entry, any hot work to be carried out and the selection of electrical equipment of an approved standard such as flameproof for example; and finally ensuring that employees were fully instructed in the hazards associated with the operation and the control measures that should be adopted. Again answers to this part were limited in content and generally referred only to the need to introduce a permit to work system and to provide operator training. There was a proposal for the office building to be made fire resistant which seemed to suggest that the incident could be repeated.

Question 10 *A factory manufactures upholstery using fabrics, and plastic pellets. These raw materials are delivered to a warehouse. The fabrics and plastic pellets are machined to form furniture coverings and cushions. The finished product is then stored in a despatch warehouse prior to distribution. The movement of goods around the premises is carried out by Liquid Petroleum Gas (LPG) fuelled forklift trucks. The company is located on the outskirts of a small town and employs 230 people.*

Outline** the range of factors that must be addressed to ensure a suitable and sufficient fire risk assessment is made for the premises.* ***(20)

There are a number of factors to be considered in carrying out a suitable and sufficient fire risk assessment of the premises described in the scenario and the more able grouped them under the general headings of fuels, ignition sources, people issues, preventive actions, mitigating actions, means of escape and management systems.

Factors connected with fuels which would have to be addressed include the LPG for the forklift trucks, the flammable covers and untreated fillings and structural issues such as the materials of construction of the premises themselves.

Ignition sources would include those connected with the use of electricity including the likely presence of static, friction from machinery which may not be adequately maintained, “illegal” smoking by personnel, the controls (or lack of them) introduced for maintenance which might include hot work, and the possibility of arson.

As for people issues, attention would have to be given to the number of persons to be evacuated in the event of a fire including visitors and contractors with the needs of disabled employees being particularly addressed.

Preventive actions would include special precautions for the LPG store such as segregation, bunding and the provision of a fixed sprinkler system; regular maintenance of electrical systems and cleaning of trucks and moulding machines; the use of fire resistant cover materials; minimising the amount of stock kept on the premises and ensuring a good standard of housekeeping with facilities provided for the segregation of waste.

Mitigating actions would be concerned with the compartmentalisation for higher risk areas such as the plastic store; the sufficiency and appropriate nature of the fire fighting equipment together with its location; smoke venting of warehouses together with the provision of fixed protection systems; an adequate supply of water and of foam; ensuring the audibility of alarms; and providing access for emergency services.

The assessment would need to give particular attention to the means of escape and there would have to be assurance that these were continually maintained and that fire doors were correctly specified. Attention would have to be given to travel distances including multi-storey considerations, the provision of normal and emergency signage and emergency lighting together with refuges for subsequent evacuation and the provision of assembly points in a place of safety.

Finally the assessment would have to consider the management systems introduced for the maintenance and testing of fire precautions and mitigation equipment; the appointment and training of fire wardens; the carrying out of fire drills and the training given to employees both in evacuation procedures and the use of fire fighting equipment.

There were some good answers provided for this question although marks were lost by those candidates who provided generic answers referring, for example, to factors such as fire exits without adding the adequacy of their number, their width and location and training without explaining its content. There were candidates who did not align their answers to the scenario given so that the assessment they provided could have applied to any workplace.

Question 11

(a) ***Outline*** *the duties of designers under the Construction (Design and Management) Regulations 2007 (CDM 2007).* ***(6)***

(b) ***Outline*** *examples of the ways in which designers can affect the health and safety performance of a construction project.* ***(4)***

(c) *A contractor is to be engaged to demolish a disused factory.*

Outline *examples of the information that the client should provide to the tendering contractors to fulfil their duty under CDM 2007.* ***(10)***

This was a popular question which produced a few very good answers. Under the Construction (Design and Management) Regulations 2007, a designer has a duty to avoid in his designs foreseeable risks to the health and safety of any person carrying out the construction work, involved in future maintenance or cleaning of the structure or using the structure as a workplace the Workplace Regulations contain provisions relating to the design of materials used in the construction of a workplace; to provide with his design sufficient information to assist the client, other designers and contractors to comply with their duties under the CDM Regulations; to provide information as required for the Health and Safety file and to check that the client is aware of his duties under the Regulations; in the case of a notifiable project, that the required notification has been made; and that they have the necessary competence for the duties that they undertake. Most candidates realised that designers should eliminate hazards and reduce risks during design not only in the construction phase but also in subsequent phases such as maintenance and cleaning but only the more able added the duties of ensuring the client was aware of his duties or that they themselves had the necessary competence to carry out what they had to do.

In answer to part (b), Examiners were expecting candidates to provide examples such as specifying safer materials from a COSHH perspective; reducing manual handling risks by minimising block size; promoting safer construction methods, for example, by arranging for windows to be fitted from inside the building and ensuring that risks from working at height are reduced to a minimum. This part of the question was not so well answered with only better answers able to provide sufficient detail on how a designer can make a contribution to the health and safety performance on a construction project.

For part (c), candidates should have outlined examples of information such as the location of buried services and underground tanks; details of hazardous and flammable substances stored on the site and the presence of any remaining hazardous machinery or equipment; possible contamination of the ground or drains; the location of other hazards such as asbestos; details of weaknesses in the structure such as fragile roofs or the presence of rot; ground conditions such as possible instability and the existence of culverts; previous use of the land; means of access to the site and traffic routes; the proximity of neighbours; details of the project coordinator if the project is notifiable and the Health and Safety file if there is one in existence. This last part of the question was well answered with most candidates showing a good understanding of the demolition process.

The National Examination
Board in Occupational
Safety and Health

Dominus Way
Meridian Business Park
Leicester LE19 1QW

telephone +44 (0)116 2634700
fax +44 (0)116 2824000
email info@nebosh.org.uk
www.nebosh.org.uk