BOARD OF STUDIES
NEW SOUTH WALES

2010 HSC Construction
Sample Answers

Section II

This document contains 'sample answers', or, in the case of some questions, 'answers could include'. These are developed by the examination committee for two purposes. The committee does this:

(a) as part of the development of the examination paper to ensure the questions will effectively assess students' knowledge and skills, and

(b) in order to provide some advice to the Supervisor of Marking about the nature and scope of the responses expected of students.

The 'sample answers' or similar advice are not intended to be exemplary or even complete answers or responses. As they are part of the examination committee's 'working document', they may contain typographical errors, omissions, or only some of the possible correct answers.

Question 16

Answers could include:

Safety/lockout tagging is used when an electrical machine or equipment is faulty or maintenance is being carried out.

Question 17

Sample answer:

An earth leakage circuit breaker is used to prevent electrocution if a fault occurs when using a power tool.

Question 18

Sample answer:

Colours & symbols in signage sort dangers and hazards into categories. They are easy to understand. Mandatory signs are blue and white e.g. Safety goggles. Hazards signs are yellow & black e.g. electrical hazard.

Question 19 (a)

Answers could include:

Minimising waste in the construction industry can be achieved by using careful measuring techniques (e.g. Measure twice cut once) and by reusing materials on other sites. Projects are best designed to use standard unit sizes that do not produce as much waste.

Question 19 (b)

Answers could include:

The construction industry has negative short and long term environmental impacts due to waste. Dust and other small particles can be moved from a site via wind gust or vehicles leaving the site. The dust and particle can then be washed from drainage systems into the waterways. This can affect the quality of waterways and fauna or flora around it. Chemical spills can cause both short and long term problems killing fauna and flora and having a long-term effect on the ecosystem. The overuse of natural resources such as trees can have a long-term impact on greenhouse gases.

Question 20 (a)

Sample answer:

Concrete:

$2.4 \times 2.1 \times .125 \times 1.1 = 0.693m^3$

Order: 0.8m^3

Cost:

$0.8 \times \$220 = \$176$

Bricks:

$2 \times 1.88 \times 1.1 = 4.136m^2 \times 50 = 206.8 \div 207$

$1 \times 1.38 \times 1.1 \times = 1.518m^2 \times 50 = 75.9 \div 76$

$1 \times 2.4 \times 1.1 \times 2 = 5.28m^2 \times 50 = 264$

This gives a total of 547 bricks (207 + 76 + 264)

Adding 5% wastage = $547 \times 1.05 = 574.35$

$\therefore$ = 575 bricks

$\frac{575}{1000} \times \$900 = \$517.50$

Concreting = \$176.00

$$\frac{\text{Brickwork}}{\text{Total}} = \frac{\$517.50}{\$693.50}$$

Question 20 (b)

Sample answer:

Aggregate is best stored covered in a clean bunker, accessible for safe delivery and redistribution separated from other materials.

Question 21 (a)

Sample answer:

A physical hazard that could cause an injury to a worker could be an unguarded Dropsaw.

Question 21 (b)

Sample answer:

An employer can safely manage chemicals in the workplace by ensuring the MSDS register for each chemical is available and followed. This may involve ways to safely store, handle and dispose of the chemical as well as the PPE that should be used. Chemicals should be stored in appropriate containers in a designated and lockable storage area. Storage areas should be well sign posted. Employers are responsible for training employees in the safe handling of chemicals and the correct response to spills.

Question 21 (c)

Sample answer:

A hazardous process could be the cutting of a concrete floor with an abrasive disc in a portable saw in which cables might be laid.

A tradesperson or supervisor should apply the Hierarchy of Risk Control to the cutting of the concrete floor by using the sequence of procedures following:

Eliminate – Place the cables inside a wall cavity instead of through the slab.
Substitute – Use a 'wet saw' to reduce dust hazard.
Engineering/administrative control – Have conduit laid before concrete is poured.
PPE – Use earmuffs and dust mask.

Question 22

Sample answer:

In the communication between the Builder and the Client a face-to-face meeting is initially appropriate. During the project, phone calls and emails may be used to exchange information. Regular meetings to discuss the progress of the project may additionally be required.

The Builder and Supplier will also need to communicate. Emailing the supplier is appropriate so that clear orders and quantities required can be placed. A quote may be faxed or emailed back to have a clear record of costs and quantities ordered. Phone calls to the supplier to organise the delivery of goods, often from a mobile phone provide clear, up to date information.

Question 23

Answers could include:

Tool selected	• Impact Drill
Use	• The impact drill is used for drilling into concrete or brick for fixtures such as bolts, plugs or screws.
Training	• Training may include the following: • General OHD induction (white card) • Specific Tool Induction • Knowledge of the manufactures instruction manual. • The correct use, storage, maintenance and tagging of the tool. • The correct use of PPE such as earmuffs, safety glasses and dust mask.
Limitations	• The size of chuck and the power of drill (rated in watts). • The weather conditions, as use outside in wet weather is hazardous. • The diameter of drill and the material to be drilled.

Section III

Question 24

Answers could include:

- The construction industry has become safer to work in over recent years. This is due to a number of factors. Government legislation such as the Occupational Health and Safety Act and Work Cover has placed a duty of care on both employers and employees. The higher risk of fines and prosecution for unsafe acts has forced the construction industry to work in a safer manner. A culture in which everyone is responsible for workplace safety has evolved.
- Companies seek to avoid accidents since they require workers compensation to be paid out to the employee. Companies with an incidence of higher accident rates may have to pay more for their insurance in subsequent years. They may also be fined if the accident was caused by not following safe procedures or practices.
- Workers are now inducted onto sites and also in the use of equipment. This better understanding of what they have to do also minimises the rate of accidents. The use of safe Work Method Statements ensures risks are considered and controls are put into place before work commences.
- A lot of materials now come prefabricated, for example timber house frames. Not having to cut them on site where the ground may be uneven and other conditions are not as good as a factory makes the process safer. Materials such as MDF, treated pine and any material containing asbestos have been replaced. Construction techniques for working at height have changed over the years. Ladders are now restricted and scaffolding is now used. Workers also need to use harnesses when working at height.
- Workers now have to wear highly visible clothing to make them easier to see. They are also more sun aware, using hats and sunscreen.
- Much work has also been done in manual handling for eg. Cement bags come in 20 kg instead of 40 kg. MSDS provide essential information about materials and goods.

Section IV

Question 25 (a)

Sample answer:

Levelling device: Dumpy level

General maintenance needs to be carried out on the dumpy level. It should be clean and have any dirt removed from the tripod and scope. A visual check of the dumpy level and staff should be carried out looking for damage or faults. All screw threads and mechanical parts should be lubricated.

The safe use of the dumpy level includes setting up the tripod in a stable area to allow for as many readings to be taken as possible without moving it. The Dumpy needs to be checked for level before readings are taken. PPE such as a visible vest and a Safe Work Method Statement should consider all site hazards such as power lines.

The dumpy level should always be stored in its protective case and the staff and tripod collapsed and kept in secure storage out of the weather.

Question 25 (b)

Sample answer:

Devices: Laser level and water (hydrostatic) level.

Comparison & Contrast Table
Laser Level

Comparison & Contrast Table	
Laser Level	**Water (hydrostatic) level**
• Accuracy easily achieved	• Accurate
• Maintains efficiency over 20 metres	• Needs to be replaced at regular intervals
• Single operator possible	• One or two person operation
• Relatively expensive	• Relatively inexpensive to purchase
• Training required to use safely	• Minimal training required
• Low maintenance cost	• Low maintenance cost
• Relatively quick to use	• More time consuming to set up
• OHS signage required when in use, including eye protection for the laser	• Safety trip hazard for the hose

Note: The answer does not have to be in table form.

Question 25 (c)

Sample answer:

Complete Safe Work Method Statement to identify any possible hazards or risks on site that are relevant.

The laser level is set-up on secure ground where it can be in site of the most measurements. Ensure it is away from the proposed excavation area. Secure the laser on top of the tripod and check the laser is working within its limits of slope for self-leveling.

A level plane needs to be determined from ‘A’ up the slope, past ‘D’.

The distance of 12 metres can then be measured along the horizontal plane and projected to ground level to determine where point ‘D’ should be located. This should then be pegged or marked with line marking paint.

Points ‘B’ & ‘C’ could be found by measuring equal distances between ‘A’ and ground level of point ‘D’. These would also be pegged or marked at ground level. Vertical heights can be measured from the horizontal line with a staff.