

B O A R D O F S T U D I E S
NEW SOUTH WALES

2011 Industrial Technology: Metal and Engineering Technologies HSC Examination 'Sample Answers'

When examination committees develop questions for the examination, they may write 'sample answers' or, in the case of some questions, 'answers could include'. The committees do this to ensure that the questions will effectively assess students' knowledge and skills.

This material is also provided to the Supervisor of Marking, to give some guidance about the nature and scope of the responses the committee expected students would produce. How sample answers are used at marking centres varies. Sample answers may be used extensively and even modified at the marking centre OR they may be considered only briefly at the beginning of marking. In a few cases, the sample answers may not be used at all at marking.

The Board publishes this information to assist in understanding how the marking guidelines were implemented.

The 'sample answers' or similar advice contained in this document 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.

Section II

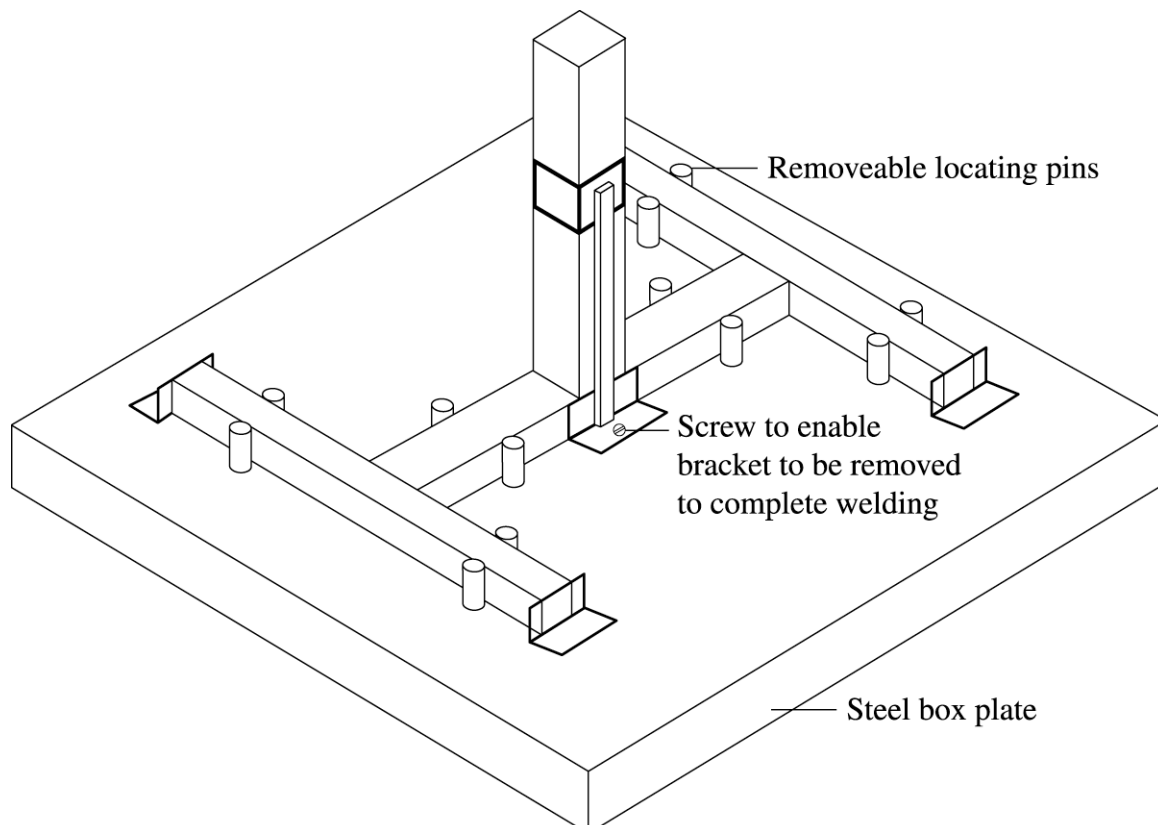
Question 11

Answers could include:

- cold heading and thread rolling
- upset forging of the head and rolling the thread
- wire coil
- pre straightening
- die casting
- cut to length
- head shaped and heading machine
- blanks fed into thread cutting disc
- blank cut
- starting with hexagonal stock – parallel turn shank
- machine thread on lathe or hand cut with stock and die
- CNC machining from hexagonal stock – including thread cutting
- drop forging then rolled thread.

Question 12

Sample answer:



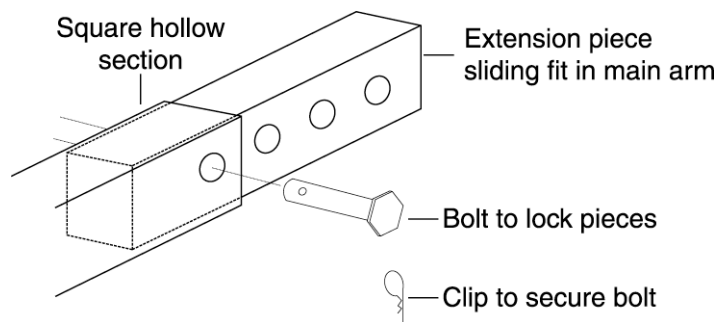
Question 13

Answers could include:

- cut stock to required size (round bar that is over the maximum diameter of the piece)
- centre drill holes for mounting one end in lathe jaws and the other in live centre
- check all is in order before turning round bar true
- based on measurements turn sectors for handle, neck and thread to size
- use parting tool to square shoulder
- taper turn section by either offsetting tail stock or adjusting the compound slide
- knurl handle with knurling tool
- cut thread, either with a stock and die or on the lathe using an appropriately shaped cutting tool – making use of back gears and lead screw to get correct pitch.

Question 14 (a)

Sample answer:



Question 14 (b)

Sample answer:

If mild steel is used it would have good strength properties, but would need to be protected from the environment so it did not rust. Ideally, it would be galvanised to protect the surface from rusting. Galvanising is a durable finish that will last well in a marine environment. If the steel was simply painted it would need to be checked regularly as any chips would expose the surface and allow it to rust.

I would suggest that aluminium be used in the construction of the davit as it would not rust. This would be really good in the marine environment due to the presence of saltwater. By not rusting, this davit would last a really long time and help save the user money. As for a finish, aluminium can be powder coated to give it a hard enamel finish. Powder coating comes in many different colours that could be matched to the environment it will be used in. This powder coating will also help stop any form of oxidization that may occur on the aluminium surface and still be able to resist the effects of salt water. Powder coated aluminium would be a good choice.

Materials:

- mild steel
- aluminium.

Surface finishes

- galvanising
- powder coating
- 2 pack polyurethane
- none (aluminium).

Question 15 (a)***Answers could include:***

Personal issues should include:

- a core of experienced staff, particularly HR manager
- someone
 - who fully understands the company's policies, ethos and procedures
 - has the authority to make decisions
- recruit locals to build local profile and teamwork
- employment
 - local or transferred from old site/parent company
 - travel interstate – cost, family, emotional/financial
 - training, multiskilling
 - facilities, provision, room, toilets, showers etc
 - legislation, EEO etc
 - low morale issue that could cause distress or concern
 - change in staff dynamics
 - communication between management and staff about the expansion.

Question 15 (b)***Answers could include:***

Factors other than personnel:

- location
 - near to market for products (outlets, material, transport)
 - near to labour supply – skilled and unskilled, local or transferred old site
 - near to supply of raw/input materials
 - suitable geographic conditions considering heat/humidity/flood/fire/snow etc

- positioned well to compete with opposition companies
- positioned well for storage, logistics, distribution and waste management
- state and local legislation and their effect on operations, hours, zone etc
- ensure that same quality of production as at parent company plant
- need for company to be able to act with some autonomy and not have to constantly seek approval of decision from 'head office'
- competition, market share, opportunities for growth
- marketing of new facility
- need for new equipment and/or technology
- ability to act with autonomy rather than constantly seek approval from 'head office'.