BOARD OF STUDIES
NEW SOUTH WALES

2010 HSC Industrial Technology
Automotive Technologies
Sample Answers

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.

Section II

Question 11

Answers could include:

- Selector fork
- Shift forks

Question 12

Answers could include:

- Cost effectiveness
- Aesthetics
- Safety
- Accuracy
- Interfacing with computer management system
- Reliability
- Maintenance

Question 13

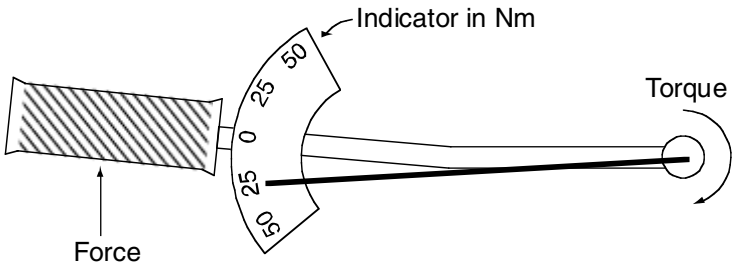
Answers could include:

Advantages	*Disadvantages*
Cost effectiveness	Costly
Aesthetics	Harder to repair
Safety	Minor damage may compromise safety
Stronger	Too light
Better finish	
Complex shapes	
Strength to weight ratio	

Question 14

Sample answer:

Adjust to the desirable torque, put a suitable socket on the square drive, tighten nut/bolt; it goes 'click' when desired torque is reached.

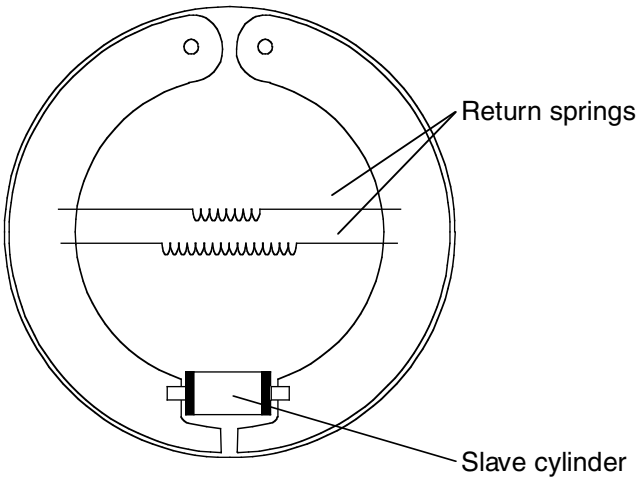


Example sketch of torque wrench

Question 15

Sample answer:

Hydraulic brake fluid is forced down the brake lines from the master cylinder. The pistons in the wheel cylinder move outwards pushing the leading and trailing shoe onto the wheel drum, which reduces the speed of the wheel through friction.



Question 16

Sample answer:

Engine management systems are electric/computer functioning systems, which receive, and store/and react to information constantly gathered from sensors within the various systems in the vehicle. They monitor and adjust the fuel injection, the advance or retorting of the spark (ignite). Monitor torque and adjust/control turbo charger. They monitor engine temperature and breaking and adjust some by sensor.

They have taken the place of, and taken over the management of carburettor, distributors and ignite coils. These were previously set at optimum performance but were not able to be regulated or adjusted while the vehicle was operating. The engine management system has enabled constant monitoring and regulation while the vehicle is operating. While the engine management system is wonderful when operating correctly, it is a very expensive item to replace when it is damaged or malfunctions.

Section III

Question 17 (a)

Answers could include:

Environmental considerations which may affect a decision to expand a company or relocate:

- Change in distance from markets/storage/logistics
- Change in distance from suppliers
- The type of manufacturing process involved in the production
- The opportunities to save or recycle waste
- The greater or lesser use (demand for) utilities such as water, electricity, gas and storage
- The environmental consideration of relocating the staff

Question 17 (b)

Answers could include:

A small business must assess what stage the business is currently in (establishment, growth, maturity or post-maturity phase) and what business plan they have for the next five years and/or succession planning. The business is relocating to enable expansion.

Structural Issues:

- Relocating will enable the adoption of new strategies in production layout, storage, prototype and development work
- The outsourcing of some production would permit reduction in staff numbers or multi-skilling
- Promote multi-skilling, as job skill enlargement and/or job enrichment. It brings about better management structure with employees getting more responsibility, more job satisfaction, and probably more pay

Technical Issues:

- Opportunities to adopt new technologies both in production and administration
- Better production flow
- Better quality control measures can be introduced
- Introduce newest and latest means of production
- Enable a true comparison with competitors
- Whereas some jobs may become redundant other new jobs will be established
- Gives opportunities for retraining/ multi-skilling

Personnel Issues:

- Trained, experienced and loyal staff are a business's greatest asset
- Any change must be "sold" to staff emphasising the improvement and advantages they will be part of
- Change in technology and structure will infringe on staff and therefore care should be taken not to alienate key staff
- Key staff are identified by using a personnel skills audit process looking at an individual's experience, skills and personal qualities
- A change is also a chance to "cull" personnel that fail to contribute
- Retrained, up-skilled, multi-skilled and loyal employees should be recognised publicly and rewarded