BOARD OF STUDIES
NEW SOUTH WALES

2011 Industrial Technology: Automotive 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:

- build up of heat in breaking fluid (boiling/overheating)
- damage to breaking system resulting in a leak (piston leak/split brake line)
- moisture (water) in the break fluid/air bubbles in the fluid
- excessive braking.

Sample answer:

Continuous heavy braking can cause a build up of heat in the brake fluid, which can cause brake fade.

Question 12

Sample answer:

A child restraint must be placed in a vehicle so that the child is not exposed to the possible impact of air bags. Approved anchoring points must be used as supplied by the car manufacturer.

Answers could include:

- Position:
  - cannot use front seats – airbag position in vehicle needs to be considered (curtains?).
- Selection:
  - size/weight/age of child affects the selection of restraint type
  - intrusion bar height needs to be consistent as the seat changes.
- Security
  - suitable anchoring points
  - anchoring system/belts must confirm to Transport NSW/Australian standards
  - correct use of fastening points.

Question 13

Sample answer:

Problems that may occur – as result of lowering a vehicle closer to the ground than Transport NSW specifications – can include: reduced safety, defect notices, fines and registration issues. If a vehicle is raised excessively the centre of gravity is increased, which can cause handling difficulties, especially when cornering at speed or emergency handling to avoid an accident.

Answers could include:

- geometry issues for steering/suspension
- strain on components, eg bushes, excessive wear on steering/joints
- uneven tyre wear
- legislative issues including
  - ride height
  - insurance
  - registration
  - fines and/or defect notices.

Question 14

Sample answer:

- The development of the disc-brake system was a significant improvement in braking safety/efficiency over the drum-brake system. The expansion of brake drums increases the distance between the drum and shoe. In the disc system, expansion of components is not a problem because – with the disk being exposed to the air – the heat is quickly released.

Answers could include:

- better materials – fluids/pads/rotars
- ABS/EBD – electronic control assist
- improved vane design/vented rotors for cooling
- aerodynamic break cooling
- disc over drum – cooling/load capacities
- brake booster – increased braking force.

Question 15

Sample answer:

Air flows into the top of the carburettor through the air horn. When the air hits the venturi, the air particles speed up and are compressed to pass through the constriction the venturi creates. As the air passes the fuel nozzle, the airflow from the venturi creates a vacuum that draws out the fuel, which mixes with the air.

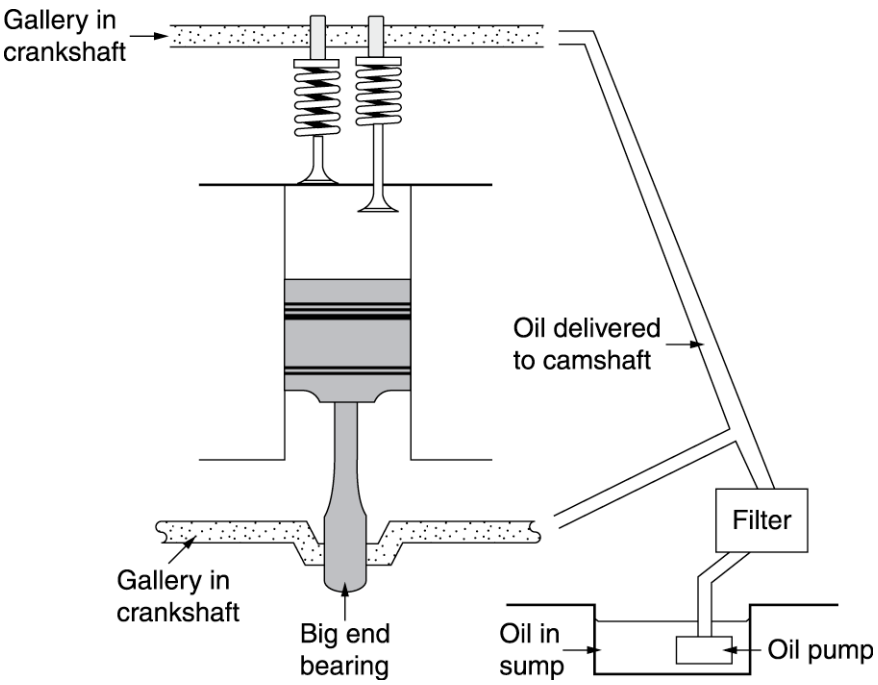
Answers could include:

Key areas:

- constricted shape causes compression of the air, increasing the airflow
- airflow speeds up
- airflow creates a vacuum effect that draws fuel up to mix with the air.

Question 16

Sample answer:



Oil is drawn into the block from the sump, from where it flows through oil passages along the crank shaft, oiling journals and bearings as it goes past and up into the head – where arms, shafts, lifters etc are oiled – through passages and back nto the sump. Oil is splashed or squirted onto the pistons to lubricate the rods.

Section III

Question 17 (a)

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 17 (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'.