

2015 HIGHER SCHOOL CERTIFICATE EXAMINATION

**Automotive
Mechanical Technology****Section II****35 marks****Attempt Questions 16–21****Allow about 50 minutes for this section**

Answer the questions in the spaces provided. These spaces provide guidance for the expected length of response.

Question 16 (4 marks)

Ten litres of engine oil have been spilled on the workshop floor.

4

Outline how to clean up and dispose of the waste.

other workers
of the spill.

Soak the spill with dry ~~cloths~~ rags or dry woodchips so the spill is soaked up as best as possible, using rubber gloves pick the cloths/dry matter up & put in an oil waste bin or bag. Mop spill with the mop & bucket until spill is completely clean. Put up "Wet floor" signs around the area to notify co-workers of a slip hazard. Leave the floor to dry.

Question 17 (4 marks)

- (a) Where should a workshop dispose of trade waste water? 1
- ~~to~~ Refer to the MSDS of the active constituent mixed with the water. Also keep in separate drums or containers & give to the waste water truck to dispose of.
- (b) Outline TWO environmental consequences of incorrect trade waste disposal. 3

1) If ^{trade} waste water enters a creek or river it could have a massive affect on the ecosystems downstream eg. Poison fish & other species. Also could react with the water badly eg. Mixing with other natural chemicals to create Algal blooms etc.

2) If the ecosystems are damaged & fish species start to die off it will start to affect humans to eg. water could be un-drinkable.

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**Automotive
Mechanical Technology****Section II (continued)****Question 18 (3 marks)**

All new vehicles registered in Australia need to be compliant with Australian Design Rules (ADR).

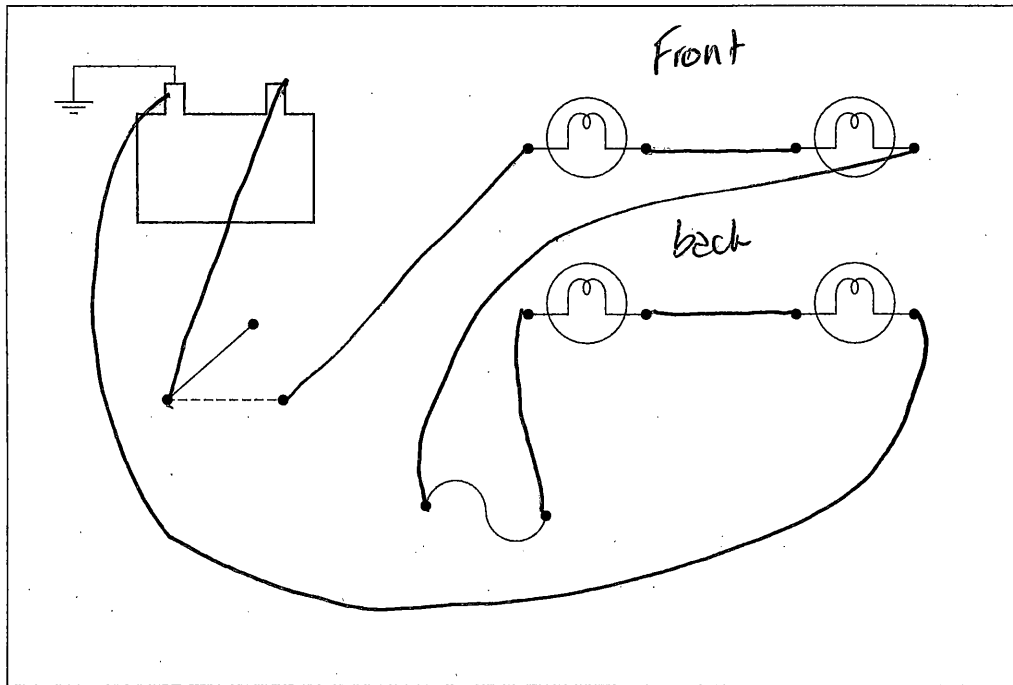
3

What is the purpose of these rules?

The purpose of these rules is to ensure the safety of everyone on the road. Vehicles that are faulty are more likely to cause accidents than that of vehicles that are in good working order. By raising the standards of vehicles ~~being roadworthy~~ on the road it is improving the safety on our roads. Australian design rules helps to ensure that car safety is the key feature to any new car. Eg. Fewer blind spots, more visibility.

Question 19 (7 marks)

- (a) Construct a parking light circuit in the box below, using all the symbols provided. 5



- (b) Explain how you would use a voltmeter to test voltage drop to the parking/tail light circuit. 2

Connect the voltmeter to the battery, record the original voltage eg (12v). turn park lights on & record the second voltage eg (11v). This could mean that the voltage in the battery is dropping 1v each time the parking lights are on.

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Automotive
Mechanical Technology**Section II (continued)****Question 20 (8 marks)**

- (a) Describe how the motor sport industry has influenced the development of vehicle brake technologies. 3

Because race vehicles are traveling at such extreme speeds it is essential to have brakes that are safe & effective. By using brakes of the same standard on regular vehicles this improves the safety and effectiveness of the brakes even more so.

- (b) Explain how an anti-lock braking system (ABS) prevents wheel lock-up in emergency braking conditions. 5

~~So~~ when traveling on a dirt road for example, it is quite easy to skid & lose control by ~~usi~~ having a ABS braking system it is very hard to skid, instead of locking up ~~at~~ wheels & skidding down the road, ABS makes the car shudder down the road, this in turn enables the car to stop alot quicker than if it was skidding.

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**Automotive
Mechanical Technology****Section II (continued)****Question 21 (9 marks)**

- (a) Why should a workshop vice be left with a gap between the jaws when it is not in use? 1

It makes it easier for the next person to use it. Also relieves strain on vice.

- (b) Under what circumstances should the drilling speed be changed on a pedestal drill? 2

If drilling through very thick steel, by slowing down the drill bit this decreases the risk of it over heating and chattering.

- (c) What precautions should be observed when using an electric welder in the workplace? 2

That appropriate PPE is worn & people standing by are aware of the bright welding arc & are not looking at it. Also that cross winds are allowed to flow through workshop as welding gases & fumes are toxic.

Question 21 continues on page 16

Question 21 (continued)

- (d) Describe the advantages of using electric-powered tools compared with air-powered tools.

4

Electric tools are easier to use as you can get in more hard to reach places as you would with air powered tools, also they are safer to use as the risk of high pressured air entering the blood stream is minimised. Also electric tools aren't as loud as air powered tools, this is reducing the risk of industrial deafness. (Even though noise is reduced it is still vital to wear appropriate PPE).

End of Question 21