

4292 Level 2 Technical Award in Vehicle

Test Title: 4292 – 020/520 Level 2 Vehicle Technology – Theory Exam (1)

March 2018

Q	Acceptable answer(s)	Guidance	Max mks
1a	Any two of the answers shown below; <ul style="list-style-type: none"> • BAR • Pounds per Square Inch (PSI) Pascal.		2
1b	i) When the pads come into contact with the discs (1 mark), friction is generated (1 mark). ii) The friction (1 mark) will be reduced (1 mark).		2 2
2a	THREE of the following suggested reasons must be given; <ul style="list-style-type: none"> ▪ Copper is a better to conductor due to its low internal resistance ▪ Copper resists breaking when bent and shaped ▪ Copper is malleable ▪ Aluminium is tougher. ▪ Aluminium is lighter in weight Aluminium is more likely to corrode when near moisture	Must have at least one property from each material to achieve full marks.	3
2b	Any Two of the suggested answers must be given; To increase the boiling point (1 mark) to improve cooling efficiency (1 mark). Allow for higher combustion temperatures (1 mark) which gives a more efficient combustion process (1 mark).		2
3a	Current (1 mark) and Voltage (1 mark)		2
3b	Reduced current (amperage) reading (1 mark) and reduced voltage reading (1 mark).		2
4a	<ul style="list-style-type: none"> • Drive pulley • Mounting point • Electrical connection 		3
4b	Changes voltage from AC to DC (1 mark), charges the battery (1 mark) and maintains voltage to vehicle electrics (1 mark).		3

5a	Lightweight (1 mark) with a high power output/revs higher (1 mark). Can also accept fast (1 mark).		2
5b	1 mark for any of the following reasons: <ul style="list-style-type: none"> ▪ Offers good road holding ▪ Provides greater traction when laden ▪ Can be used with larger engines ▪ Can be used with larger gearboxes ▪ Allows a greater transfer of power ▪ Provides increased traction 	One mark per reason given up to a maximum of two marks. (Two correct answers required for two marks and one correct answer for one mark).	2
6a	Provides greater rear suspension travel (1 mark). Light weight construction allows improved performance (1 mark). Offers high power transfer characteristics (1 mark)		2
6b	Any four of the suggested explanations below and any other suitable answer; <ul style="list-style-type: none"> • provides compact design • Allows more space in passenger cabin • Improved traction • Simpler to manufacturer • Drives steered wheels 		4
7	One mark for each comparison. <ul style="list-style-type: none"> ▪ A four stroke piston engine produces less power for the equivalent capacity (1 mark). ▪ A four stroke piston engine is more reliable and less prone to wear and has a greater life expectancy (1 mark) ▪ Four stroke piston engine produces more torque for a given rpm range (1 mark) ▪ Four stroke piston engine produces less emissions (1 mark) 		4
8a	A twin steer system (1 mark) used to equalise load carrying capacity (1 mark).	Must identify the steering layout with one reason for its use.	2
8b	It converts the rotary motion (1 mark) into linear motion (1 mark) and increases the turning force applied (1 mark) to the road wheels. (1 mark)		4
9a	Digital (1 mark) Vernier gauge (1 mark) used to measure (any one of the following components) <ul style="list-style-type: none"> ▪ brake disc thickness (1 mark) ▪ brake pad thickness (1 mark) wheel cylinder/piston diameter (1 mark)		3
9b	Full marks for any four of the points listed (or any similar answer)		4

	<p>Zero the bore gauge (1 mark). Insert the bore gauge into the cylinder (1 mark). Take a minimum of two measurements (1 mark) at different points within the cylinder at a minimum of three different depths (1 mark) (top middle and bottom)</p> <p>Using a micrometer measure the bore gauge jaws (1 mark) (or take the readings off the bore gauge).</p>		
<p>10</p>	<p><u>Band descriptors</u></p> <p>9-12 marks They have identified a range of systems and have compared all relevant elements of the systems. Detailed explanation made of materials and load carrying capabilities and shows a good depth of understanding. They have recommended a suitable drive train layout and given a clear rationale for their reasons. They have provided detail of several key areas and clearly demonstrated their ability to correctly link them together. The response is well structured and supported with justifiable reasoning.</p> <p>5-8 marks They have identified two systems and attempted to compare some elements of the systems. Some mention made of materials and load carrying capabilities but shows no depth of understanding. Recommended a suitable drive train layout and has given a brief rationale for their reasons. They have provided limited detail of only one or two key areas and able to correctly link them together. The response is structured with some reasoning supported by sufficient reasoning or justification.</p> <p>1-4 marks The learner shows a limited knowledge of the task or how to approach it. They have identified one system without comparison to others. No mention made of materials or load carrying capabilities. Recommended a drive train layout but has not given rationale for their reasons. They have provided limited detail of only one or two key areas but unable to link them together. The response is unstructured and is not supported by sufficient reasoning or justification.</p> <p>0 marks No rewardable material.</p>	<p>Indicative content</p> <p>Learners are asked to produce a proposal for selecting appropriate systems. In their proposal, they are to consider the following:</p> <ul style="list-style-type: none"> ▪ different <ul style="list-style-type: none"> • drive train layouts • axle layouts • suspension systems ▪ properties and types of materials to use and how they are suitable ▪ vehicle load carrying capabilities. 	<p>12</p>