

4292-21 Level 2 Technical Certificate in Automotive

4292-522 Level 2 Automotive - Theory exam (1)

March 2022 Mark Scheme

Q no.	Acceptable answer(s)	Guidance	Max mks	Ref
1a	1 mark per reason, to a maximum of 2 marks: <ul style="list-style-type: none"> To protect themselves (1). To protect other people (1). To protect the environment (1). 	Accept any other reasonable correct answer.	2	201-2-2.3 A01
1b	If the employee is injured (1), then the employer could be fined/face imprisonment (1).		2	201-1-1.1 A02
2a	1 mark per responsibility, to a maximum of 2 marks: <ul style="list-style-type: none"> To repair complex vehicle faults (1). To liaise with the manufacturer (1). To speak to customers (1). To train technicians (1). To mentor technicians (1). 		2	202-2-2.3 A01
2b	They will have to train technicians in the diagnosis and/ repair of electric vehicles/the safety of working with higher voltages (1), to keep safe and reduce the possibility of accidents (1).		2	202-2-2.2 A02
3ai	<ul style="list-style-type: none"> Water pump (1). 	Accept coolant pump or impeller.	1	203-1-1.1 A01
3aii	1 mark per check, to a maximum of 2 marks: <ul style="list-style-type: none"> Check for correct Belt tension (1). Check for water / coolant Leaks (1). 	Accept check for noise.	2	203-1-1.1 A01
3b	<ul style="list-style-type: none"> Service book (1) or Technical manual (1) or Data books (1) or Electronic data (autodata) (1) or Company or manufacturer's service sheets or MOT test manual. 	Do not accept job card.	1	203-3-3.1 A01

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4a	When the wheel is turned the threaded worm rotates (1), this then moves the peg up and down the threads which is connected to the drop/pitman arm (1).		2	204-1-1.3 A02
4b	1 mark per check, to a maximum of 2 marks: <ul style="list-style-type: none"> • Check for leaks / pitting (1) • Check for a damaged / broken spring (1) • Check for wear in the bushes (1) • Check for compression / rebound (1). 	Accept charging equipment to charge vehicles.	2	204-2-2.3 AO1
5a	The disc allows the heat generated by the pads rubbing on the contact surface (1) to escape more easily (1) by radiating out between the two surfaces via the central vents (1).		3	205-1-1.3 AO2
5b	<ul style="list-style-type: none"> • Brake caliper (1). 	Accept air/heavy vehicle brake caliper.	1	205-1-1.4 AO1
6a	A twin steered axle gives an increased steering angle to a single steered axle (1), which improves manoeuvrability and control when turning (1).	Accept carries increased load and provides greater traction.	2	205-2-2.1 AO2
6b	1 mark per reason, to a maximum of 2 marks: <ul style="list-style-type: none"> • To provide directional stability (1). • To provide self-centring steering (1). 		2	205-2-2.3 AO1
6c	<ul style="list-style-type: none"> • Swivel pin (1) 	Accept king pin.	1	205-2-2.4 AO1

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7a	<p>Independent suspension systems: Allow each wheel to move separately from the other (1) giving better handling and road holding (1).</p> <p>Non independent suspension systems: The opposite wheels are connected to the same axle/each wheel has an effect on the other (1) so handling and road holding is not as effective (1).</p>	<p>Allow candidates up to 2 marks for each of the suspension systems.</p> <p>Do not accept cost.</p>	4	205-3-3.1 AO2
7b	<p>1 mark per force, to a maximum of 2 marks:</p> <ul style="list-style-type: none"> • Compression (1). • Tension (1). • Bump (1) • Rebound (1) 		2	205-3-3.3 AO1
7c	<ul style="list-style-type: none"> • Live/Driven/Drive (1). 	<p>Accept live rear axle. Do not accept rear axle.</p>	1	205-03-3.4 AO1
8ai	<p>1 mark per reason, to a maximum of 2 marks:</p> <ul style="list-style-type: none"> • Improved passenger space (1). • To alter/ change centre of gravity (1). • Improved aerodynamics (1). • Road holding (1). • To provide greater traction (1). 	<p>Accept any other reasonable correct answer.</p> <p>Do not accept cost.</p>	2	208-1-1.2 AO1
8aii	<p>The engine will allow the rear wheels to gain more traction (1) due to the weight transfer of the engine being placed over them (1).</p> <p>The front wheels will have less traction/grip (1) due to there being less weight over the wheels (1).</p>		4	208-1-1.2 AO2
8b	<p>1 mark per reason, to a maximum of 2 marks:</p> <ul style="list-style-type: none"> • Petrol engines are light (1). • Give a good power to weight ratio (1). • They are free revving/higher RPM range (1). 	<p>Do not accept cheaper to manufacturer.</p>	2	208-2-2.1 AO1
8c	<p>It allows the wasted gases to expand out of the exhaust port as the piston lowers (1), creating a scavenging effect allowing for a fresh charge of air to enter (1).</p>	<p>Allocate 1 mark per point made. Accept gas in place of gasses.</p>	2	208-3-3.2 AO2

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8d	<ul style="list-style-type: none"> • Silencers / noise limits (1) or • Smoke emission regulations (1) or • Exhaust / crankshaft emissions (1) or • Power to weight ratio (1). 		1	208-4-4.1 AO1
9ai	To ensure that there is no high voltage present (1), this protects the vehicle from high voltage surge (1) and protects the technician from electric shock (1).		3	209-01-1.1 AO2
9aii	1 mark per reason, to a maximum of 2 marks: <ul style="list-style-type: none"> • It may still be hot (1). • to avoid contamination (1). 		2	209-1-1.1 AO1
9b	<ul style="list-style-type: none"> • Series (1). 		1	209-01-1.1 AO1
9ci	<ul style="list-style-type: none"> • Diode (1). 		1	209.01.1.4 AO1
9cii	To allow current to flow in one direction only (1).		1	209.01.1.4 AO1
10a	1 mark per reason, to a maximum of 2 marks: <ul style="list-style-type: none"> • Ensure it is aligned centrally on the clutch/friction plate (1). • Ensure it is located into the crankshaft/spigot bearing-bush (1). 		2	210-01-1.1 AO1
10b	The baulk ring brakes/speeds up the gear (1), in order to match the speed of the other gear due to friction (1).		2	210-02-2.2 AO2
10c	<ul style="list-style-type: none"> • Clutch slip (1). 	Allow 1 mark for slip.	1	209-03-3.1 AO1

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11	<p><u>Band descriptors</u></p> <p>0 marks No awardable material.</p> <p>1-3 marks Candidate has attempted explanation however this will be lacking in detail. Candidate has provided a vague overview of how the task will be performed.</p> <p>Limited understanding is demonstrated. They will only focus on either procedure or checks/adjustments.</p> <p>The response is unstructured and is not supported by sufficient explanation.</p> <p>4-6 marks Candidate has attempted an explanation with some detail and structure.</p> <p>Candidates will demonstrate some understanding of both the procedure and checks required. And made some recommendations for check and adjustments required.</p> <p>7-9 marks Candidates have completed a detailed explanation. Showed a good depth of understanding of the task.</p> <p>The response is well structured, logical and includes accurate recommendations for checks and adjustments required.</p>	<p><u>Indicative content</u></p> <ul style="list-style-type: none"> • Health and safety observed through task. • Use of equipment and tools. • Procedure for removing and refitting of steering rack. • Carry out steering geometry alignment. • Setting up of the steering angle sensor using diagnostic equipment. 	9	AO4