2020 HSC Automotive Vehicle Body Marking Guidelines

Section I

Multiple-choice Answer Key

Question	Answer
1	A
2	C
3	D
4	A
5	C
6	D
7	D
8	C
9	D
10	A
11	C
12	C
13	B
14	A
15	B

Section II

Question 16 (a)

Criteria	Marks
• Provides a sound understanding of the purpose of a risk assessment	3
• Provides some understanding of the purpose of a risk assessment	2
• Provides some relevant information	1

Answers could include:

- Identify hazards such as tools and equipment, COVID-19 etc
- Using a risk matrix to determine the likelihood of occurrence
- Risk minimisation and controls.

Question 16 (b)

Criteria	Marks
• Provides a detailed description of the process of safely removing the differential assembly using industry best practice • Uses industry terminology	4
• Provides a sound description of the process of safely removing the differential assembly using industry best practice • Uses some industry terminology	3
• Provides some steps in the process of safely removing the differential assembly	2
• Provides some relevant information	1

Sample answer:

Identify jacking and support points, check SWL of lifting and support equipment then raise the vehicle to safe working height and support it on safety stands. Check the vehicle is safe once supported.

Support the differential assembly with suitable equipment. Remove supporting bolts and suspension components using correct tooling then safely lower the differential assembly using lifting equipment or team lift.

Question 17 (a)

Criteria	Marks
• Outlines how a vehicle can be easily identified as having a mandatory safety recall completed by a manufacturer	1

Sample answer:

All manufacturers provide a sticker to be stuck on the vehicle A-pillar (driver's side) indicating the recall number and date completed.

Question 17 (b)

Criteria	Marks
• Provides a comprehensive explanation of why manufacturers recall and repair vehicles that are outside mandatory warranty periods • Uses industry terminology	4
• Provides a sound explanation of why manufacturers recall and repair vehicles that are outside mandatory warranty periods • Uses some industry terminology	3
• Provides some explanation of why manufacturers recall and repair vehicles that are outside mandatory warranty periods • Uses basic industry terminology	2
• Provides some relevant information	1

Sample answer:

Manufacturers need to comply with Australian federal law to provide consumers with a recall action free of charge and within a reasonable amount of time. This law is designed to protect the customer (owner) from harm. It also protects the general public from harm from a faulty vehicle.

Answers could include:

Recalls can also be actioned by manufacturers as a matter of goodwill where faults are consistent within a model range or type of vehicle where the failure is considered to be well before a reasonable service life period.

Question 18

Criteria	Marks
• Provides a detailed description of the process and safety aspects of removing and storing automotive SRS airbags • Uses industry terminology	3
• Provides a basic description of the process and safety aspects of removing and storing automotive SRS airbags • Uses some industry terminology	2
• Provides some relevant information	1

Sample answer:

To safely remove an airbag a vehicle needs to be disabled and made safe following the manufacturer's procedures. This usually involves disconnecting the battery or specific fuse. Correct tools must be used to remove the airbag taking note of steering wheel position. Airbags must be stored in an upright position in a cool dry place. Airbags should be deployed and made safe where possible if being discarded.

Question 19

Criteria	Marks
• Provides a comprehensive description of the problems that may occur if an engine bay is cleaned incorrectly • Uses industry terminology	4
• Provides a sound description of the problems that may occur if an engine bay is cleaned incorrectly	3
• Identifies some problems that may occur if an engine bay is cleaned incorrectly	2
• Provides some relevant information	1

Sample answer:

Failure to correctly clean the vehicle engine bay may cause many issues. In modern vehicles, there are many electrical components in the engine bay such as control units and fuse boxes. Although they have sealed connectors they can still be damaged by excess water and chemicals which cause corrosion and wiring damage.

The vehicle intake system must also be sealed so water cannot enter the engine cylinders as it can cause catastrophic damage when the engine is started. The use of incorrect chemicals may damage paintwork as well as plastic and rubber components.

Question 20 (a)

Criteria	Marks
• Lists multiple correct types of contaminants	3
• Lists a few correct types of contaminants	2
• Lists ONE correct contaminant	1

Answers could include:

Answers may contain three of the following:

- Silicones
- Grease
- Road tar
- Dirt
- Dust
- Acids
- Heavy metal particles
- Polishes.

Question 20 (b)

Criteria	Marks
• Provides a comprehensive description of the appropriate processes for the removal of contaminants prior to painting a panel	5
• Provides a detailed description of the appropriate processes for the removal of contaminants prior to painting a panel	4
• Provides a sound description of the appropriate processes for the removal of contaminants prior to painting a panel • Uses some industry terminology	3
• Provides a basic description of the appropriate processes for the removal of contaminants prior to painting a panel	2
• Provides some relevant information	1

Sample answer:

Prior to painting a panel the panel must be washed thoroughly to remove dirt and dust. The panel is then wiped down with a prep wash to remove oil and grease contaminants. Using wet and dry sandpaper, wet sand the panel to remove the oxidisation then re-wipe with prep wash to clean the panel after sanding to make it ready for painting.

Question 21 (a)

Criteria	Marks
• Calculates the correct current	1

Sample answer:

Power/Volts = Amps

100 / 12 ≈ 8.3 amps

Question 21 (b)

Criteria	Marks
• Provides correct calculations of current draw and selects appropriate wire size	3
• Demonstrates some understanding of calculating the current draw and appropriate wiring size	2
• Provides some relevant information	1

Sample answer:

Ohm's Law formula

Power = Voltage × Amps

Power / Volts = Amps

300 Watts/ 12 Volts = 25 Amps

Calculated current = 25 amps so the wire size required is 5 mm based on the chart provided.

Question 21 (c)

Criteria	Marks
• Provides a thorough description of the steps required to isolate the brake lamp fault • Uses correct industry terminology	4
• Provides a sound description of the steps required to isolate the brake lamp fault • Uses some industry terminology	3
• Provides a basic description of the steps required to isolate the brake lamp fault • Uses basic industry terminology	2
• Provides some relevant information	1

Sample answer:

To isolate a brake lamp fault, firstly confirm the fault (fuse blows when brake depressed). Locate the appropriate wiring diagram, check that correctly rated fuse has been used and then check the rear lamps for wiring damage or additions such as trailer plug. Identify plugs and connectors, disconnect identified plugs to isolate the area of the fault. Fault should be identified and confirmed at each stage of the process.

Section III

Question 22 (a)

Criteria	Marks
• Provides a thorough explanation of the differences between a structural and a non-structural panel on a vehicle • Uses correct industry terminology	5
• Provides a sound explanation of the differences between a structural and a non-structural panel on a vehicle • Uses some industry terminology	3–4
• Provides a basic explanation of the differences between a structural and a non-structural panel on a vehicle	2
• Provides some relevant information	1

Sample answer:

Non-structural panels are cosmetic panels that do not contribute to the structural integrity of the vehicle. These panels are generally fixed to the vehicle by bolts and clips and are easily removed with basic hand tools.

Examples of non-structural panels include:

- Bonnet
- Guards
- Doors
- Bumpers
- Boot lids / tailgates.

Structural panels are part of the monocoque system making up the structural integrity of the vehicle. These panels are designed to absorb impact and protect the passengers as well as mounting engine and suspension components.

Examples of structural panels include:

- Vehicle A pillars
- Vehicle B pillars
- Vehicle C pillars
- Vehicle roof
- Vehicle quarter panels
- Vehicle floor panel.

Question 22 (b)

Criteria	Marks
• Provides a comprehensive description of the correct processes and quality checks when refitting vehicle body panels following painting and repair • Uses industry terminology	9–10
• Provides a detailed description of the correct processes and quality checks when refitting vehicle body panels following painting and repair • Uses some industry terminology	6–8
• Provides a sound description of the correct processes and quality checks when refitting vehicle body panels following painting and repair • Uses basic industry terminology	3–5
• Provides a basic description of the correct processes and quality checks when refitting vehicle body panels following painting and repair	1–2

Sample answer:

Refitting vehicle body panels after painting and repair requires the panel to be protected, particularly around the edge with masking tape. The panel should then be carefully fitted to the vehicle, and loosely held in place with fasteners. The panel's alignment should start with an adjacent panel and reflect the manufacturer's specified gaps. When the body gap and body lines are aligned, gently tighten the fasteners until the panel does not move and retains its correct fixed position. Alignment of headlights and bumpers is then carried out prior to any decals or body mouldings being fitted or replaced.

Decals such as clear stone guard adhesive acrylic, 'tune up' specification and air conditioning refrigerant charge specification decals are then applied and positioned correctly as they were originally.

Accessories such as mudflaps and body finishing panels need to be correctly attached with effective retaining clips or polyurethane adhesive if required. Correct colour match with the repaired panel should also be confirmed.

Original and/or added accessory electrical components such as movement sensors and additional lighting should be carefully installed and correct operation, calibration and adjustment confirmed.

Advanced driver assistance systems (ADAS) are required to be checked with an appropriate diagnostic scan tool and calibration jig to ensure correct and safe operation of these active safety systems.

Section IV

Question 23

Criteria	Marks
• Provides a comprehensive evaluation of how governments, vehicle manufacturers and repairers are meeting the challenge of continually improving environmental sustainability • Provides clear links between governments, vehicle manufacturers and repairers and environmental sustainability • Provides a logical and cohesive response • Uses specific industry terminology	13–15
• Provides a thorough evaluation of how governments, vehicle manufacturers and repairers are meeting the challenge of continually improving environmental sustainability • Provides links between governments, vehicle manufacturers and repairers and environmental sustainability • Provides a logical and cohesive response • Uses specific industry terminology	10–12
• Provides a sound evaluation of how governments, vehicle manufacturers and repairers are meeting the challenge of continually improving environmental sustainability • Provides some links between governments, vehicle manufacturers and repairers and environmental sustainability • Provides a logical and cohesive response • Uses industry terminology	7–9
• Provides some evaluation of how governments, vehicle manufacturers and repairers are meeting the challenge of continually improving environmental sustainability • Provides some basic links between governments, vehicle manufacturers and repairers and environmental sustainability • Provides a logical and cohesive response • Uses some industry terminology	4–6
• Provides general information on how governments, vehicle manufacturers and repairers are meeting the challenge of continually improving environmental sustainability	1–3

Answers could include:

- Governments are currently supporting zero emission vehicles to create a sustainable future. They have made commitments to increase the use of electric vehicles. Governments in Australia and Europe encourage the provision of infrastructure such as charging points at strategic locations to ensure the public has access within easy reach. Governments in some countries also provide incentives to the public when purchasing new vehicles (such as less tax) and lower running costs such as tolls.
- Governments are also providing public transport options such as electric trains and trams to reduce the number of polluting vehicles in densely populated cities. Governments are also reviewing emission standards, and how they will meet the reduced emission targets. This can include the use of renewable energy sources.

- Manufacturers are responding to the increase in public awareness of environmental sustainability as seen in all vehicle manufacturers constantly working to ensure their vehicles have reduced emissions. They are also producing hybrid and electric vehicle options to work towards improving the environment and the viability of their companies.
- Governments are also mandating that manufacturers use sustainable materials and processes in manufacturing processes. Manufacturers are increasing the use of recycled materials as well as using materials in their manufacturing processes that are easily recycled.
- Local councils legislate that businesses must comply with environmental regulations. Vehicle repairers have an obligation to improve environmental sustainability by complying with these regulations.
- Repairers separate their waste such as recyclables and landfill. For example cardboard and oils are sent to respective recycling centres for processing and reuse.
- Repairers should be regularly reviewing their business practices, for example conducting an environmental audit to gain a better perspective on their environmental responsibility in their local community.
- Repairers are retraining their staff in the latest technologies and also diversifying the business into hybrid and electric vehicle repair.

2020 HSC Automotive Vehicle Body Mapping Grid

Section I

Question	Marks	HSC content – focus area
1	1	(Mandatory) Sustainability – environmental compliance – page 33
2	1	(Stream) Vehicle Body – maintenance of tools and equipment – page 60
3	1	(Stream) Vehicle Body – vehicle electrical systems and components – page 58
4	1	(Stream) Vehicle Body – work tasks – pre-repair vehicle body operations and paint repairs preparation – page 61
5	1	(Mandatory) Working in the automotive industry and workplace – working in the industry – page 40
6	1	(Stream) Vehicle Body – maintenance of tools and equipment – page 59
7	1	(Mandatory) Safety – safe work procedures and practices – page 29
8	1	(Stream) Vehicle Body – application of primers – page 63
9	1	(Stream) Vehicle Body – operation of tools and equipment – page 59
10	1	(Mandatory) Troubleshooting & problem-solving – fault or problem resolution – page 36
11	1	(Mandatory) Working in the automotive industry and workplace – working in the industry – page 40
12	1	(Stream) Vehicle Body – work tasks – pre-repair vehicle body operations and paint repairs preparation – page 61
13	1	(Stream) Vehicle Body – application of primers – page 63
14	1	(Stream) Vehicle Body – electrical fundamentals – page 57
15	1	(Stream) Vehicle Body – dismantling and removing components – page 61

Section II

Question	Marks	HSC content – focus area
16 (a)	3	(Mandatory) Safety – risk management – page 29
16 (b)	4	(Mandatory) Safety – safe work procedures and practices – page 29
17 (a)	1	(Mandatory) Working in the automotive industry and workplace – working in the industry – page 40
17 (b)	4	(Mandatory) Working in the automotive industry and workplace – working in the industry – page 40
18	3	(Mandatory) Safety – safe work procedures and practices – page 29
19	4	(Stream) Vehicle Body – cleaning components – page 61
20 (a)	3	(Stream) Vehicle Body – application of primers – page 63
20 (b)	5	(Stream) Vehicle Body – application of primers – page 63
21 (a)	1	(Stream) Vehicle Body – electrical fundamentals – page 57
21 (b)	3	(Stream) Vehicle Body – electrical fundamentals – page 57
21 (c)	4	(Stream) Vehicle Body – testing electrical circuits, wiring systems and components – page 58

Section III

Question	Marks	HSC content – focus area
22 (a)	5	(Stream) Vehicle Body – cleaning components – page 61
22 (b)	10	(Stream) Vehicle Body – cleaning components – page 61

Section IV

Question	Marks	HSC content – focus area
23	15	(Mandatory) Sustainability – environmental issues and sustainability – page 33