

**GAUTENG DEPARTMENT OF EDUCATION
SENIOR CERTIFICATE EXAMINATION**

MOTOR BODY REPAIRING SG

POSSIBLE ANSWERS OCT / NOV 2006

QUESTION 1

- | | | |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 1.1 | 1.1.1 Good lighting
1.1.2 Good ventilation
1.1.3 No water or oil on the floor
1.1.4 Good housekeeping
1.1.5 Exhaust gases must be transferred to the outside
1.1.6 No playing or irresponsible actions
1.1.7 Do not work without the necessary safety equipment
1.1.8 There must be enough working space | 1x5=(5) |
| 1.2 | Compressed gas cylinders and other flammable materials should be stored in a ventilated room. | (1) |
| 1.3 | 1.3.1 No smoking in a spray booth
1.3.2 Always use a mask when spray-painting
1.3.3 Spray booth must have suction fans
1.3.4 All electrical switches must be waterproof
1.3.5 Air compressor must have a safety valve and pressure meter
1.3.6 Clean air in the spray booth must only be obtained through filters
1.3.7 Use paint and thinners enough for one day
1.3.8 No fires or open flames in the spray booth | 1x5=(5) |
| 1.4 | 1.4.1 No leaks at pipes or gauges of welding plant
1.4.2 Use welding goggles
1.4.3 No flammable materials in the area
1.4.4 No oil or grease close to cylinders
1.4.5 Don't bump cylinders
1.4.6 Always keep cylinders in upright position | (5) |
| 1.5 | 1.5.1 Fans
1.5.2 Filters
1.5.3 Smooth walls for easy cleaning
1.5.4 Good lighting
1.5.5 Switches must be waterproof
1.5.6 Outlet for water after cleaning | (any 5) (5) |
| 1.6 | Tar spots can be removed with petrol or white spirits | (1) |

- 1.7 Rust is an iron oxide into which ferrous metal changes when exposed to water and oxygen simultaneously. (4)
- 1.8 Bolts and nuts tend to loosen after some time because of vibrations. (2)
- 1.9
- 1.9.1 Must be able to be pulverized
 - 1.9.2 Must have a good basis
 - 1.9.3 Must be stable and permanent
 - 1.9.4 Must not crack when dry
 - 1.9.5 Easy to mix with other substances (Any 3) (3)
- 1.10
- 1.10.1 Strain: When outside forces are applied on a body. Change takes place, which changes the measurements and form of the body. (3)
 - 1.10.2 Elasticity of steel: It is the tendency of the metal to expand or shrink to a certain extent and return to its normal position. (3)
 - 1.10.3 Stress: It is the force or power applied to a body divided into the area. (3)
- 1.11
- 1.11.1 Rubber hammer
 - 1.11.2 File or slapper
 - 1.11.3 Shrinking dolly
 - 1.11.4 Dolly General
 - 1.11.5 Short pick or long pick
 - 1.11.6 Coarse file
 - 1.11.7 Panel beating hammers
 - 1.11.8 Cross pin hammer
 - 1.11.9 Sanding machine (8)
- 1.12
- 1.12.1 Cheaper
 - 1.12.2 Less sanding
 - 1.12.3 Easier to work with (Any 2) (2)
- [50]**

QUESTION 2

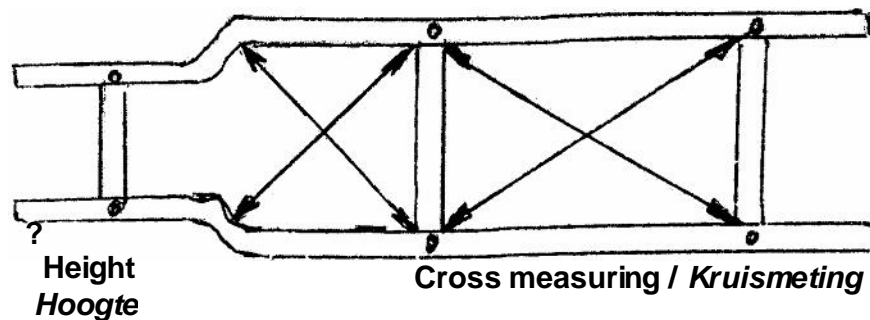
- 2.1
- 2.1.1 Sand surface thoroughly. (1)
 - 2.1.2 Cut away loose pieces of fibreglass from the edge of the tear. (1)
 - 2.1.3 Place back lining on inside. (1)
 - 2.1.4 Mix fibreglass and apply to inside. (1)
 - 2.1.5 Allow fibreglass to dry. (1)
 - 2.1.6 Apply fibreglass to outside. (1)
 - 2.1.7 Allow to dry. (1)
 - 2.1.8 Finish off with coarse file or sandpaper. (1)
 - 2.1.9 Use water sandpaper for a smooth finish. (1)
 - 2.1.10 Spray primer and finish off to a smooth surface. (1)
 - 2.1.11 Spray final coat that matches the exact colour of the car. (1)
 - 2.1.12 After work has been completed do finishing by cleaning vehicle, etc. (1)
- (12)**

- 2.2 Remove the bootlid from the car (1)
 Sand the whole area with 220 water paper. (1)
 Sand the edge of the old paint lightly. (1)
 Clean and dry the surface. (1)
 Spray a thin coat of primer. (1)
 Follow up with two coats of primer. (1)
 Leave for 30 minutes to dry. (1)
 Mix the colour while you wait for the primer to dry. (1)
 Flat surface lightly with 600 water paper. (1)
 Mix colour with three parts of thinners. (1)
 Paint the back and inside of lid first, let paint dry. (1)
 Spray a thin layer of paint on the outside. (1)
 When dry, spray another 4 layers of paint. (1)
 Let dry for 4-8 hours. (1)
 Flat surface with 1200 water paper. (1)
 Finish off with rubbing compound and polish. (1)

(13)
 [25]

QUESTION 3

3.1



(5)

- 3.2 Remove body from chassis.
 Secure chassis not to move when pulling takes place.
 Place jack under bent area.
 Jack slowly to push chassis upwards to right position.
 Do the same on the opposite side.
 The height can now be measured on the front and back to see if it is the same.
 Weld in angle-iron support if necessary.

(Name any 5 points) (5)

- 3.3 The whole area must be sanded with 220 water paper.
 Clean thoroughly.
 Spray with a thin layer of primer paint.
 Spray two layers of primer on both sides of the door.
 Leave to dry for 30 min.
 Mix the colour paint while waiting for primer to dry.
 Sand primer with 600 water paper smoothly.
 Mix one part of paint with three parts of thinners.
 Spray first the back and inside of door with colour paint.
 Let dry thoroughly before spraying outside.
 Spray the outside with thin layer of paint.
 Spray another 4 layers with 15 minutes between each layer.
 Leave for 4-8 hours to dry properly.
 Remove masking paper.
 Use rubbing compound and polish, if necessary.

15x1=(15)
[25]

QUESTION 4

- 4.1 4.1.1 Tyres must be of the same size.
 4.1.2 Tyre pressures must be the same.
 4.1.3 Check front wheel bearings.
 4.1.4 Check steering mechanism.
 4.1.5 Check steering box.
 4.1.6 Check front wheels for wobble.
 4.1.7 Check if u-bolts are tight.
 4.1.8 Check springs and shackles.
 4.1.9 Weights in the car are sometimes used before adjustment.
 4.1.10 Ground height according to specs of manufacturer.

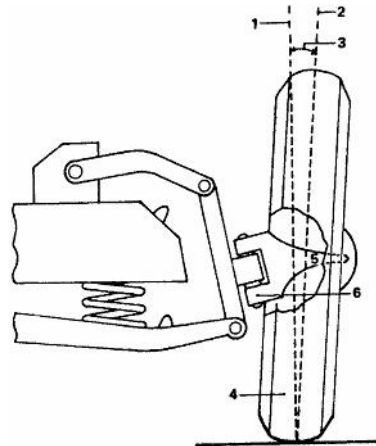
(Any 5) (5)

- 4.2 Wobbling or imbalance of the front wheels is usually caused by static or dynamic imbalance. Flat spots on the tyres or wear and tear of the steering knuckles can also be the cause of wobbling.

(3)

4.3 4.3.1 Positive chamber

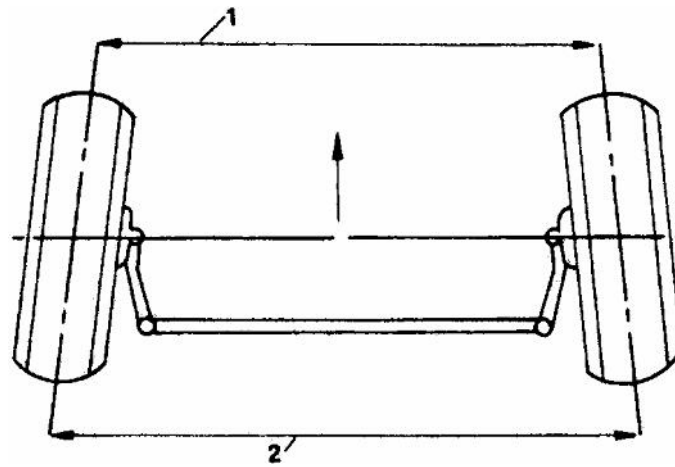
Sketch 3
Lines 2



(5)

4.3.2 Toe-in

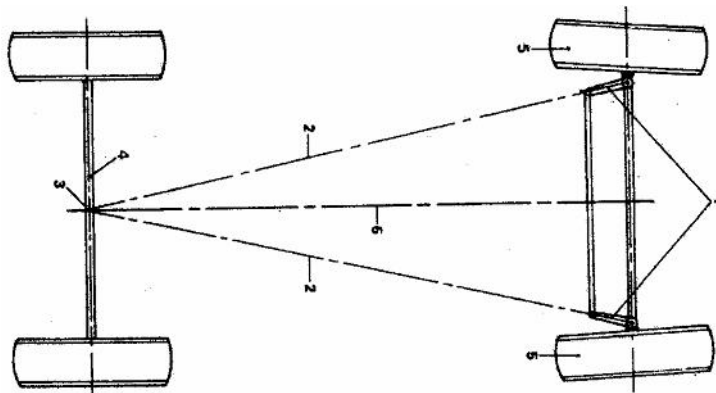
Sketch 4



(4)

4.3.3 Ackerman principle

Sketch 5
Lines 3



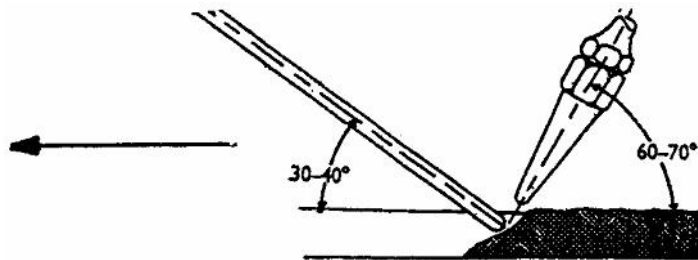
(8)
[25]

QUESTION 5

- 5.1 5.1.1 Open cylinder valves.
 5.1.2 Open acetylene and set alight. Open till smoke disappears.
 5.1.3 Open oxygen valve.
 5.1.4 The first flame is a carburizing flame: More acetylene than oxygen.
 5.1.5 By opening the oxygen valve the required flame can be obtained for the purpose of mild steel welding. A neutral flame is acquired.
 5.1.6 Oxidizing flame: More oxygen than acetylene.
 5.1.7 The neutral flame is required for mild steel. (7)

5.2 Left welding technique

Sketch 6
 Deg 2+2



(10)

- 5.3 The surface must be clean from tar and deposits both inside and outside before starting with the hot shrinking. A no.2 nozzle must be used for heating. Heat surface in the middle about 17 mm till red hot. Hold a dolly on the underside. Start knocking from the edge of the hot area with a hammer and dolly to the middle of the red spot. When reaching the red spot the metal should have shrunk. Put cold water on work area starting from the outside to inside. All the excessive metal is now drawn to the middle. A smooth surface should now be obtained.

(8)
 [25]

QUESTION 6

NAME 6

- 6.1 6.1.1 Body
 6.1.2 Spray adjusting screw
 6.1.3 Fluid adjusting screw
 6.1.4 Air valve
 6.1.5 Trigger
 6.1.6 Fluid inlet
 6.1.7 Fluid stop nut
 6.1.8 Fluid needle
 6.1.9 Fluid tip
 6.1.10 Air cap

(10)

- 6.2 6.2.1 Perfect spray pattern
 6.2.2 Not enough air
 6.2.3 Air and fluid mixture not adjusted evenly
 6.2.4 Bottom part of nozzle blocked
 6.2.5 Top part of nozzle blocked 5x2=(10)
- 6.3 Orange peel
- 6.3.1 Paint too thick
 6.3.2 Air pressure too high
 6.3.3 Spray gun too far from surface
 6.3.4 Too quick paint drying (any one) (1)
- 6.4 If damaged otherwise not. (1)
- 6.5 Oil on surface
 Polish on surface
 Surface not clean (any one) (1)
- 6.6 6.6.1 Paint and air not evenly mixed
 6.6.2 Spraygun too far from surface
 6.6.3 Dust on spraying area
 6.6.4 Air hole in holder blocked
 6.6.5 Paint too thin (any one) (1)
- 6.7 The distance that a spray gun should be held when spraying is between 150 mm and 200 mm from the surface to be painted. (1)
[25]

QUESTION 7

- 7.1 Use an old brush, apply stripper lightly over work area. Leave a while and apply final coat. Paint will start crumbling. If all the paint does not come off, apply more stripper. Use a steel brush or putty-knife to remove paint. Water must be used to clean area to remove all stripper. Rubber gloves must be used when working with paint stripper. (5)

- 7.2 ? When all dents have been removed and the area is still rough and uneven, body filler can be applied after the area has been cleaned by sanding.
- Make sure there are no more high areas.
 - Mix filler according to manufacturer's specs.
 - Use plastic plate and apply thin layer of filler.
 - Let it dry.
 - Use body file or 220 sandpaper to sand down area.
 - To smooth surface, use 600 grain water paper.
 - When area forms part of rest of the surface apply primer.
 - Use a light to check for defects.
 - Sand smooth with 600 grain water paper.
 - Apply new coats of paint and finish off. (8)
- 7.3 7.3.1 Primer
Used for bonding the colour coat (2)
- 7.3.2 Body-putty
Used to remove small dents and scratches from surface (2)
- 7.3.3 Surface coating
Like a primer but gives thickness to remove scratches. (2)
- 7.4 Cleaning the spray gun
- To clean the spray gun, excess (left over) paint must be removed from the holder. Clean the holder with thinners, and spray till all the thinners has gone through the spray gun. Toothpicks or a thin piece of wire can be used to clean air holes. (4)
- 7.5 Use rubber gloves
No open flame (2)
- [25]

QUESTION 8

- 8.1 ? Remove all the rust from the surface by sanding until you get a shiny surface. If no holes are in the rusted spot, special rust protection can be applied.
- If there are rust holes, use fibreglass to fill then. Let them dry and sand down to a smooth surface. Primer and final spray over the area will ensure that the area blends in with the rest of the panels.
 - Be careful that the outer surface does not have a feather edge. 5x2=(10)
- 8.2 This is the result of metal being exposed to water and air. All metals have an electric potential. Put two together in an acidic solution (electrolyte) and they will try to even out their different potentials. On a car the electrolyte is provided by rain. If this falls on the exposed metal at scratches on the car, rusting can begin immediately. (3)

8.3	8.3.1	On doors with no drain holes or blocked holes.	
	8.3.2	On the inside of fenders	
	8.3.3	Chip marks caused by stones	
	8.3.4	Under metal finishing strips	3x1=(3)
8.4	8.4.1	Car must be absolutely clean after assembly before final paint.	
	8.4.2	Prior treatment of car with phosphate solution	(2)
8.5	8.5.1	Stir paint for ten to twenty minutes before use.	
	8.5.2	Read the instructions carefully.	
	8.5.3	Paint of the same manufacturer must be used.	(3)
8.6	Underbody sealant		
	It is a spirit-base paint, thick and contains bitumen or rubber. This is used for protecting the underbody of a car against rust.		(3)
8.7	It is very important to clean the underbody before applying sealant. If there is any dirt over which sealant is painted rust will reappear.		(1)
			[25]
TOTAL:			200