

**MATERIALS AND PAINT TECHNOLOGY 3**

**5165**

**CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD**

**Technical and Vocational Education Examination**



**JUNE XXXX**

**INTERMEDIATE LEVEL**

|                  |                                         |
|------------------|-----------------------------------------|
| Subject Title    | <b>MATERIALS AND PAINT TECHNOLOGY 3</b> |
| Subject Code No. | <b>5165</b>                             |
| Paper No.        | <b>THREE</b>                            |

**THREE HOURS**

**You are reminded of the necessity for good English and orderly presentation in your answers.**

**Turn Over**

TOTAL: SCORE 100 MARKS

TARGETED COMPETENCY  
PART ONE; REPAIR AND REPLACING VEHICLE ELEMENTS  
ONE HOUR

This practical test consists of THREE compulsory parts and seeks to evaluate the following skills in the candidate;

- Removal and installation of vehicle elements
- Repair defective elements on the vehicle structure
- Assemble the elements
- Paint the vehicle elements
- Perform the finishing work

I REMOVAL AND INSTALL THE VEHICLE ELEMENTS..... (10MARKS)

After having made diagnosis on the vehicle brand CAMRY on figure1, the following malfunctions were observed.

- Complete absence of right light (**bulb holder, bulbs, reverse light**)
- Puncture of the front right wheel
- Partial twisting of the radiator
- A tear of 40 cm from the right wing
- Twisting of the bonnet
- Deformation of the bumper
- Minor deformation of the crumple zone

- YOU ARE GIVEN.
- Digital multimeter
  - Test lamp
  - Headlamp bulbs
  - Set of screw driver
  - Set of screw spanners

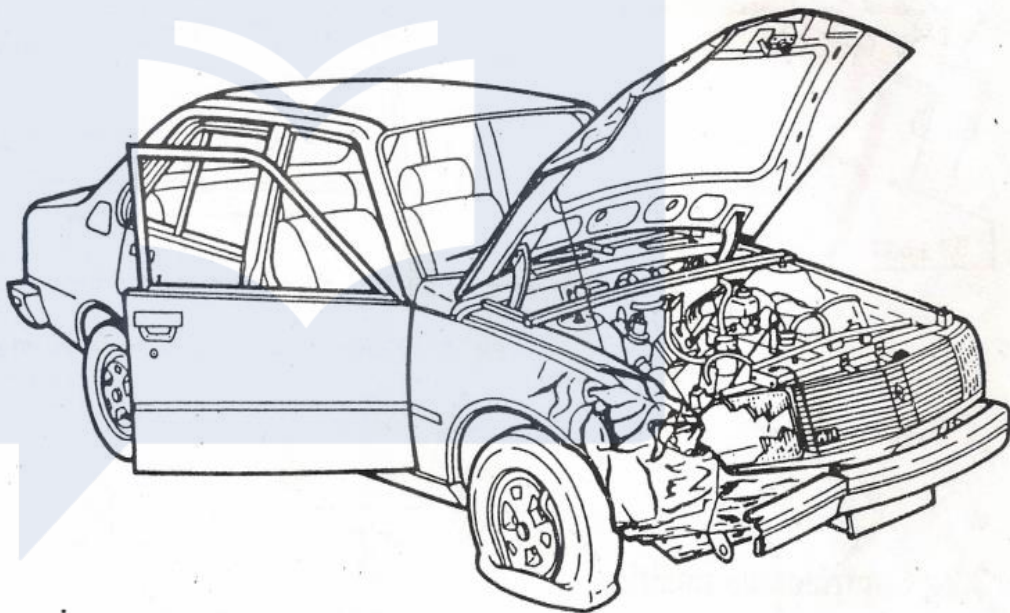


Figure1.carry

I-1 REPAIR ELEMENTS OF THE LIGHTING SYSTEM                      15 MINUTES                      10marks

- Completely reassemble the right light (**bulb holder, bulbs, reverse light**) and control it.
- For this, you have a multi-meter and dismantling tools.

EVALUATION CRITERIA:

The positioning of the right light is correct...../3marks

The adjustment of the optics and in line with the prescriptions of the manufacturer. .... /2marks

The positioning of the bulbs and the rest of the front head lights respect the highway code..... /3marks

Verification after installation of headlamp..... /2marks

**I-2 REPAIRS ON THE PUNCTURED TYRE**

**15 MINUTES**

**10marks**

**YOU ARE ASKED TO**

Raise the vehicle to allow the replacement of the punctured tyre.

For this reason, you have a jack with all the equipment necessary for this intervention. Figure.2

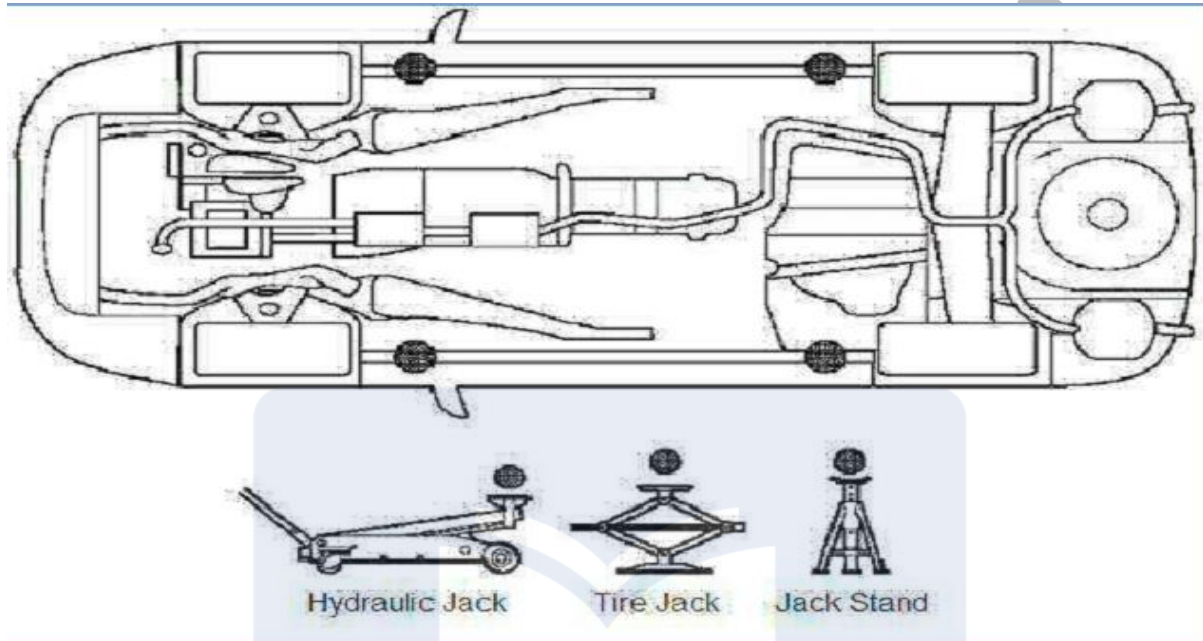


Figure 2



Figure 3

**YOU ARE GIVEN.**

- Wheel spanners
- Set of pry-bar spanners
- set of screw driver
- A set of vuganizer tool box

**PROCEDURE FOR REPAIRING THE FRONT TYRE**

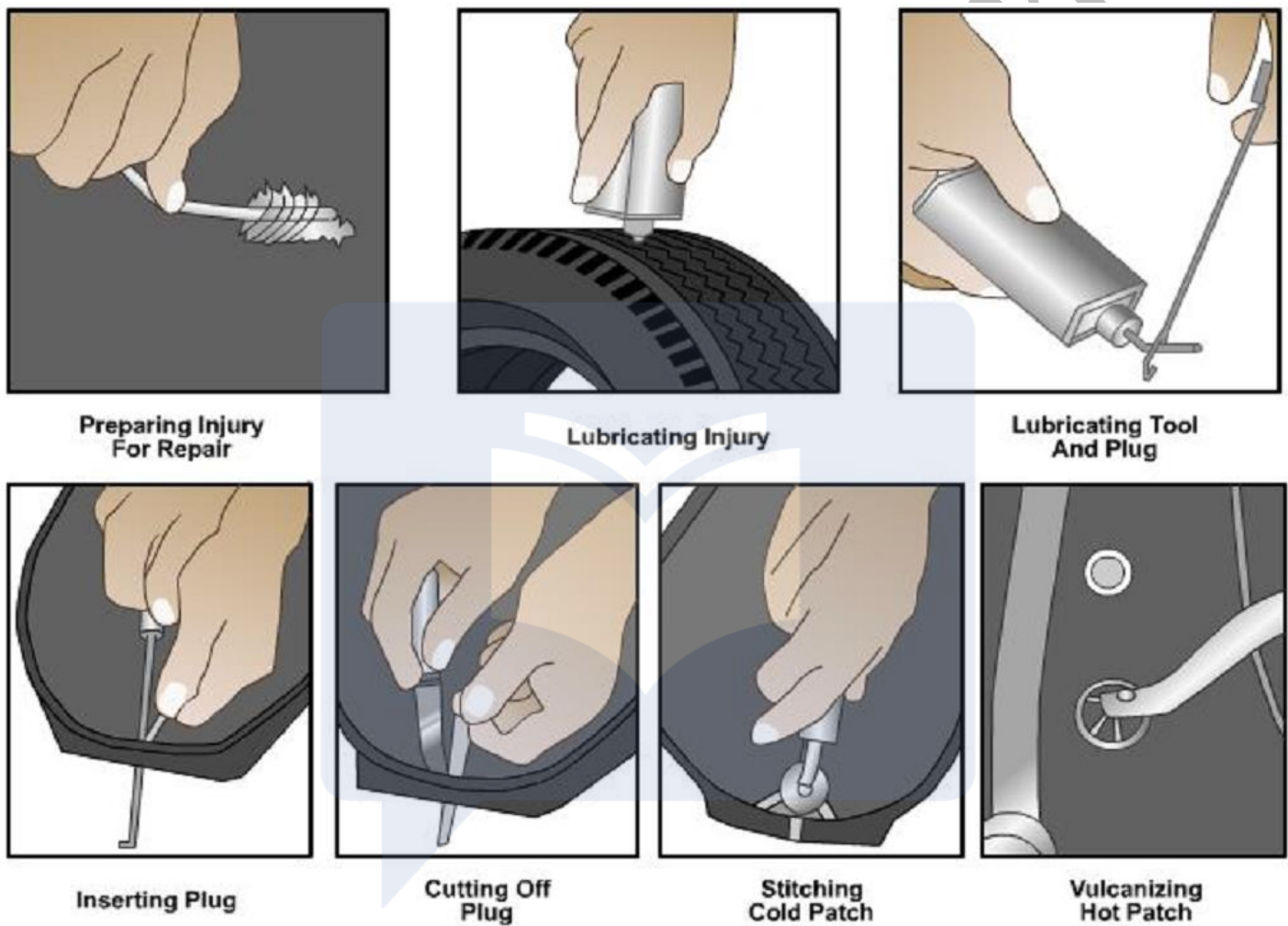


Figure 4  
**MARKING GUIDE**

|                                                                                       |         |
|---------------------------------------------------------------------------------------|---------|
| The choice of lifting point is correct and does not deform the vehicle.....           | /1marks |
| The removal of the tyre and wheel is done with respect to safety.....                 | /2marks |
| The repairing of the wheel is done with respect to safety.....                        | /2marks |
| The chosen pressure to inflate the tyre corresponds to the vehicle and tire size..... | /1marks |
| The tightening torque corresponds to manufacturing standards of the vehicle.....      | /2marks |
| The refitting of the wheel is done with respect to safety.....                        | /2marks |

### I-3 REPAIRS ON THE RADIATOR

30 MINUTES

10marks

- Change the radiator. After setting it up, you will perform the tests and checks necessary for proper functioning. You have the dismantling tools and the technical documents.

#### YOU ARE GIVEN.

- Set of spanners
- set of screw driver
- A set of radiator cleaning tools

#### MARKING GUIDE

The dismantling of the defective radiator is done without incident...../3marks

The assembly of the new radiator is carried out with care...../3marks

The test is conclusive and without leakage...../4marks

#### II – PART TWO:

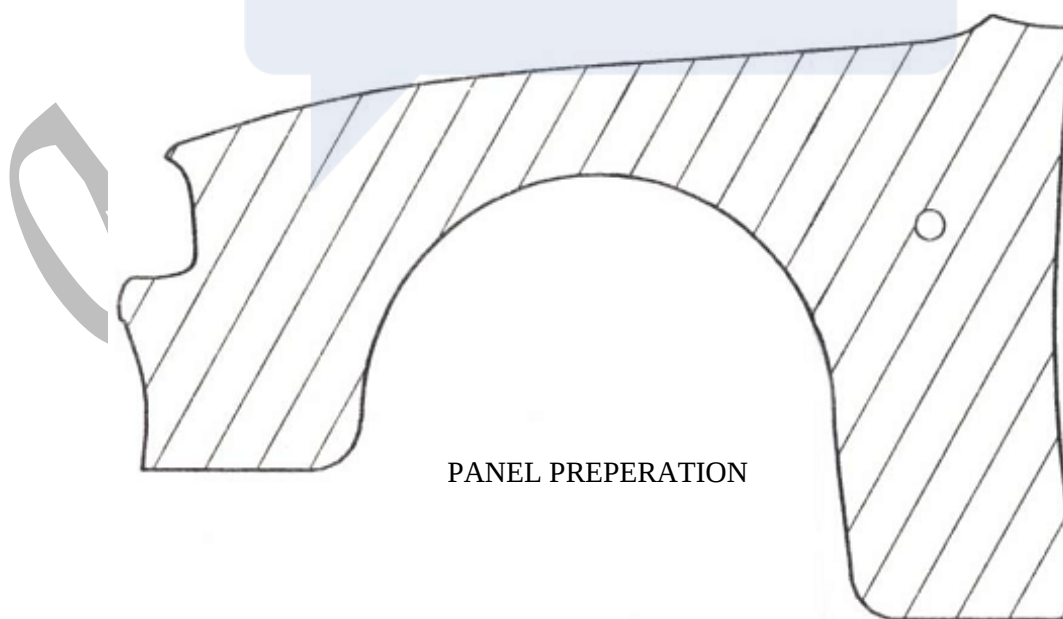
#### BODYWORK REPARATION OR MANUFACTURING OF ELEMENTS

40 MINUTES

(25marks)

On the front wing of the vehicle, you will have to repair the damaged part

#### II – I REPAIR AND STRAIGHTEN THE DAMAGED WING



**YOU ARE GIVEN. choose one among these element (bonnet, boot, door and a wing)**

- Clamps
- The sheet of steal S of thickness 10/10
- The sheet metal mallet
- Oxyacetylene welding post
- Disc sanding machine
- Filler metal Ø2.5
- Grinding wheel
- Sandpaper N° P40, P60, P80 P120

**Straighten the damage wing**

- Correct dent removal...../3marks
- Perfect fitting of the joints...../2marks

**Oxyacetylene welding of the joints**

- Correct setting of the welding post...../4marks
- Good welding penetration...../4marks

**Grind the weld**

- Uniform surface ...../3marks
- Correct handling of grinding wheel...../4marks

**Apply polyester mastic and sand**

- Correct restructuring (regular and smooth surface)...../3marks
- Correct handling of sandpaper and sequence of operation...../2marks

## II- 2 – PREPARING THE VEHICLE FOR PAINTING

40 MINUTES

(15marks)

- On the right wing of the vehicle that you have just repaired, you will undergo preparation for painting.

**YOU ARE GIVEN.**

Scraper  
Sandpaper P80; P100,P120  
Bucket (10litre with water)  
Sanding wedge  
Putty knives  
Polyester mastic (putty)  
Hardener  
Putty primer (red)  
Sponge (L= 30CM,I =10CM, THICKNESS =5CM)

**YOU ARE ASKED TO**

**Prepare the wing for coating,**

- The sanding is correct and the preparation of the wing allows for the next phase...../5marks

**Fill and sand the wing;**

- The sanding of the wing conforms to the setting of primer...../5marks

**Prepare and apply the underlying products.**

- The application procedure is respected...../5marks

**III - PART THREE. PAINT THE VEHICLE****30 MINUTES****20MARKS**

The painting will be done on the right front wing of the vehicle just repaired and prepared.

**YOU ARE GIVEN.**

Cellulose mastic  
 Hardener  
 Putty knives  
 Sandpaper numbers; P240,P320,P500, P800 P1500  
 Bucket (10litre with water)  
 Sponge (L=30CM,I =10CM, thickness=5cm)  
 Equipment and tools necessary to apply the paint  
 A complete paint box  
 Cellulose diluents

**YOU ARE ASK TO:**➤ **Make a mixture for the shade of colour:**

The shade corresponds to the colour of the vehicle...../2marks

➤ **Prepare the painting and the products:**

The dosage is correctly carried out and the quality achieved and justified...../2marks

➤ **Make the connections :**

The correct technics to connect and controlled output of the spray gun in line with the original...../2marks

➤ **Perform the recovery:**

The appearance of the surface obtained is consistent with the original appearance. .... /2marks

➤ **Eliminate defects:**

The defects found are eliminated by sanding, polishing and retouching...../2marks

➤ **Control the quality of its intervention:**

The quality of the finishing is checked and the procedure quality respected. .... /2marks

Various manipulations ..... 2 marks

Obtaining the required coloring ..... / 2 marks

Dilution of paint ..... 2.marks

Adjusting the spraying pressure ..... / 2 marks

**III-1 PART THREE: FINISHING WORK****10MINUTES****10 MARKS.****Duration: 1 hour**

The candidate must unmask the vehicle after drying or curing the paint, correcting the paint defects and installing the finishing elements.

**MARKING GUIDE**

Preparing the work post working environment ...../2 marks

Cleaning equipment ...../2 mark

Pluverisation of paint. .... / 2 marks

Unmasking the vehicle ...../2 marks

Correction of paint defects ...../2 marks

**MATERIALS AND PAINT TECHNOLOGY 3****5165****CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD****Technical and Vocational Education Examination****JUNE XXXX****INTERMEDIATE LEVEL**

|                  |                                         |
|------------------|-----------------------------------------|
| Subject Title    | <b>MATERIALS AND PAINT TECHNOLOGY 3</b> |
| Subject Code No. | <b>5165</b>                             |
| Paper No.        | <b>THREE</b>                            |

**ADVANCED EQUIPMENT AND TOOLS FOR THE CENTRES.****WORKING MATERIALS**

| SN                       | DESIGNATION                    | QUANTITY PER CANDIDATE | COST/ CANDIDATE |
|--------------------------|--------------------------------|------------------------|-----------------|
| 1                        | Sheet S235 thickness 10/10     | 500x150mm              | 2000frs         |
|                          | cardboard paper                | A3 each                | 200frs          |
|                          | Welding electrode of Ø 2.5     | 2 Length               | 250frs          |
|                          | Drill bit Ø 6.5                | 01                     | 500frs          |
|                          | Grinding wheel                 | 1 disc                 | 1800frs         |
|                          | Hardener                       | ½ a litre              | 1000frs         |
| <b>WORKING MATERIALS</b> |                                |                        |                 |
| 2                        | <b>Polyester P.38</b>          | ¼ kg                   | 1500frs         |
|                          | <b>acrylic mastic</b>          | ¼ kg                   | 500frs          |
|                          | <b>acrylic solvent</b>         | 1litre                 | 1000frs         |
|                          | <b>assorted masking paper</b>  | 2 roll                 | 1000frs         |
|                          | <b>assorted abrasive paper</b> | P40,60,240,320,500,220 | 500frs          |
|                          | <b>masking tape</b>            | 1 roll                 | 500frs          |
|                          | <b>Cellulosic vanish</b>       | ¼ kg                   | 500frs          |
|                          | Complete computer              |                        |                 |
|                          | Paint boxes                    |                        |                 |
|                          | Painting software              |                        |                 |
|                          | Paint filters                  |                        |                 |
|                          | Paint spray guns               |                        |                 |
|                          | Compressed air generator       |                        |                 |
|                          | Complete vehicle               |                        |                 |
|                          | Scale of painting cup          |                        |                 |
|                          | Mixing boxes                   |                        |                 |
|                          |                                |                        |                 |
|                          | total                          |                        |                 |

**PAINTING MATERIAL.****INDIVIDUAL TOOLS FOR CANDIDATES.**

- scarf
  - Gloves
  - Protective glasses
  - Spatula for paint mixing
  - combination for paint application
- Paint masks

