



Coimisiún na Scrúduithe Stáit
State Examinations Commission

JUNIOR CERTIFICATE EXAMINATION, 2017

METALWORK

TECHNIQUES AND DESIGN – PROJECT – HIGHER LEVEL

150 marks

PROJECT MUST BE COMPLETED BY Friday 7th April, 2017

PLEASE READ CAREFULLY

General Instructions to candidates

The project you make and submit for examination, including the design element, must be **your own individual work**, carried out in the school under the supervision of the teacher.

Your own individual work is intended to include the intellectual activity of design along with the practical activities of making the project.

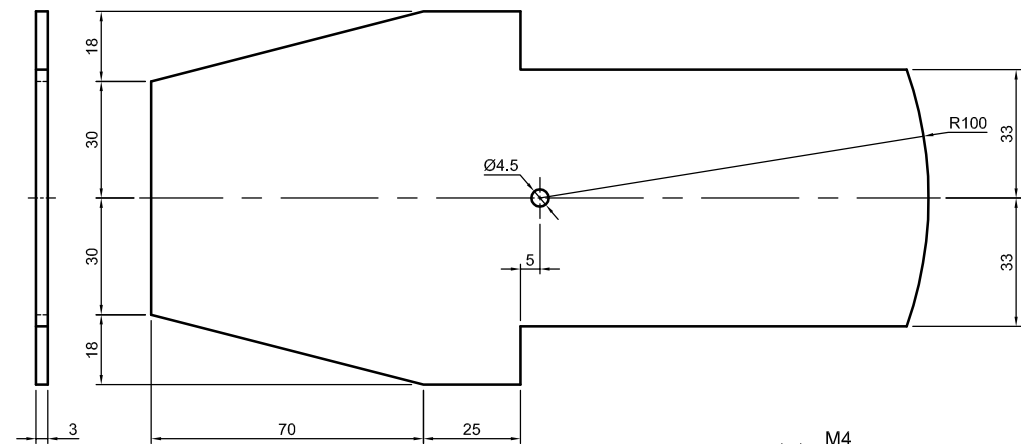
Note: For further information on this project please see the video at the URL shown below.

<https://www.examinations.ie/video/index.php/metalwork2017>

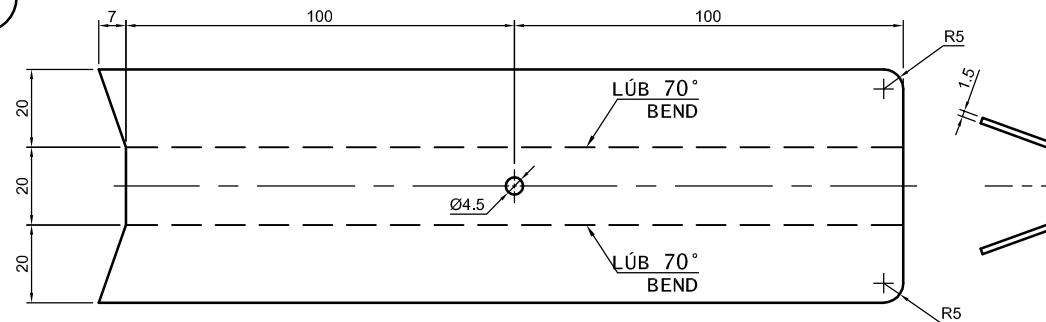
Instructions for making the project

1. Details of a **Model Autonomous Search Vehicle** are shown on the accompanying drawing.
2. Make and assemble the Project using the materials specified in the **Parts List**.
3. Design, make and attach a separate unit for each side of the model, which will securely hold the Battery Holder (Part 30) and act as a mudguard for the Wheel (Part 28).
(**Note: 20% of the marks will be awarded for this section.**)
4. Complete, **test** and **solder** the **Electric Circuit**.
Spade clips can be used with the micro-switch, if desired.
5. Your **Examination Number** must be clearly engraved in the position indicated on the drawing.
6. Your completed project, clearly identified with your **Examination Number**, must be available to the visiting examiner **along with the necessary testing equipment**.

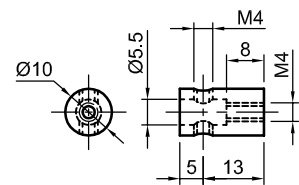
1



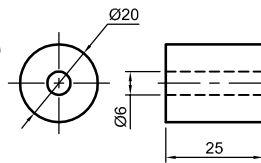
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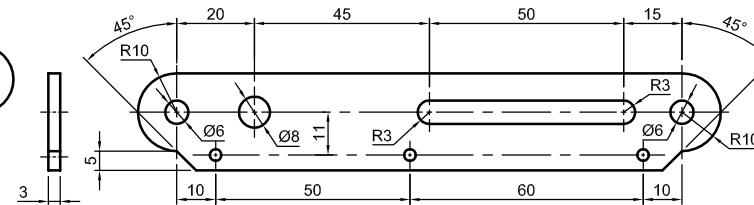
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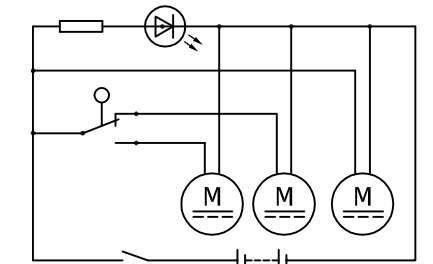
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2017. S57

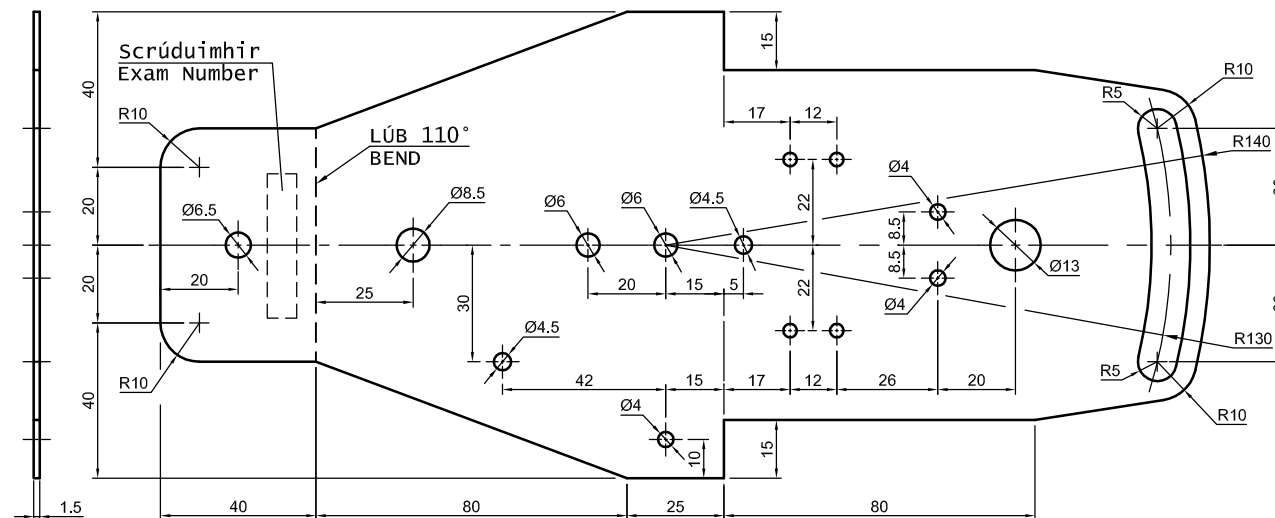


LÉARÁID LEITREACH
WIRING DIAGRAM

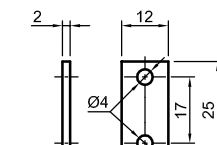
Poill gan toisí
Undimensioned holes Ø3.5

Nóta: Gabhann 20% de na marcanna le Cóimeáil, Bailchríoch agus Feidhmiú.
Note: 20% of the marks will be awarded for Assembly, Finish and Function.

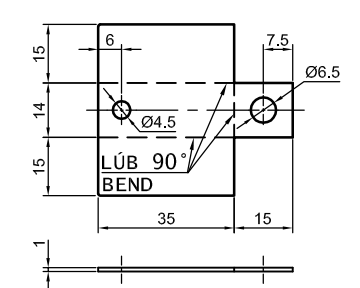
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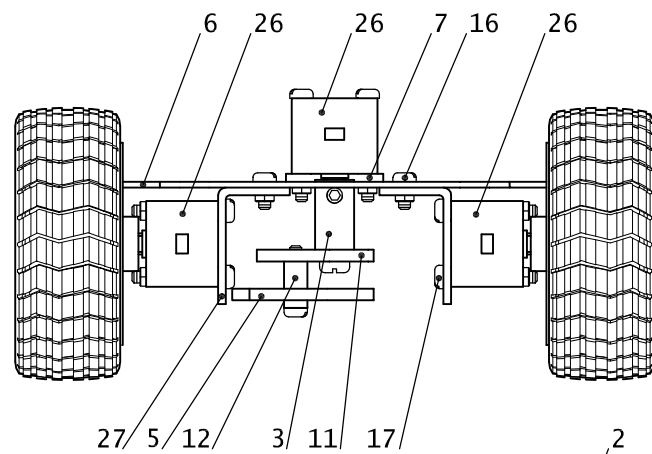
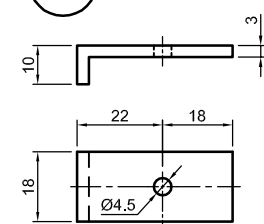
7



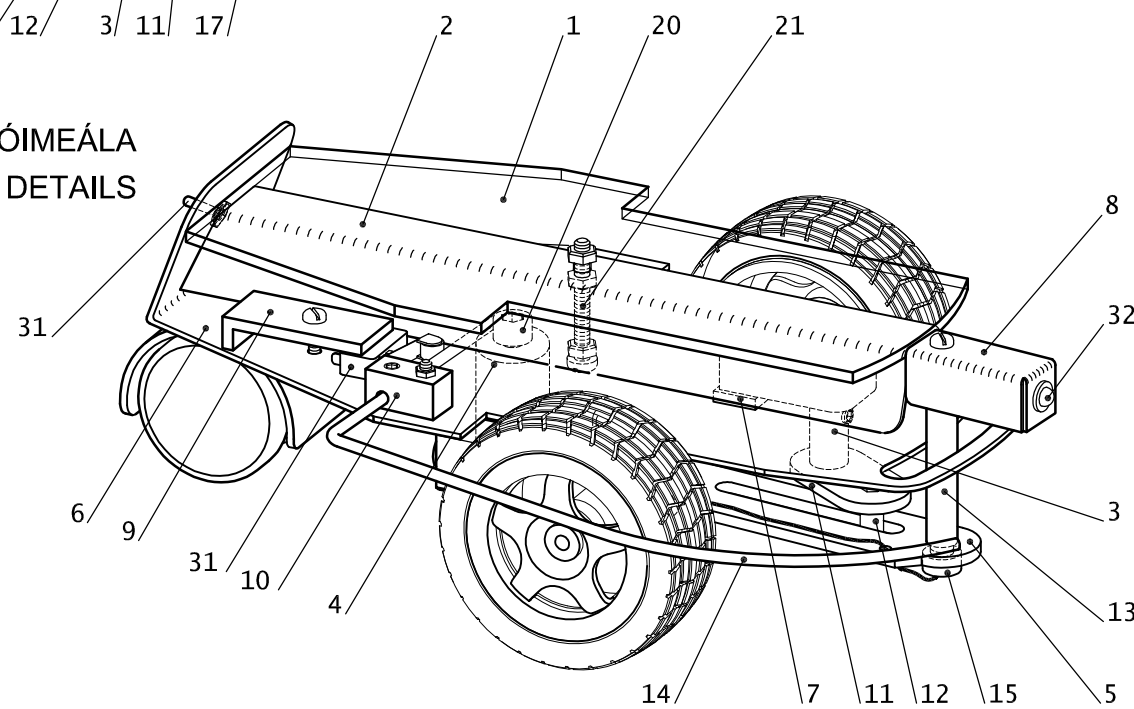
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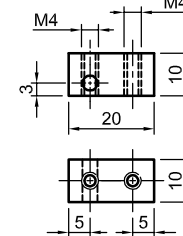
9



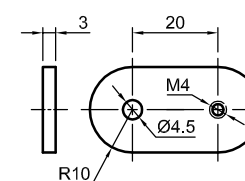
SONRAÍ CÓIMEÁLA
ASSEMBLY DETAILS



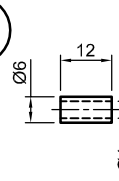
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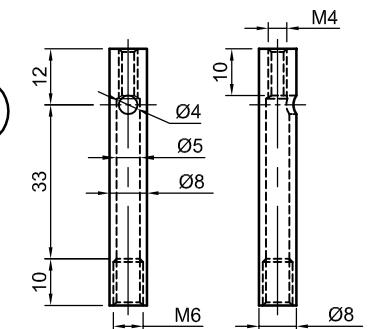
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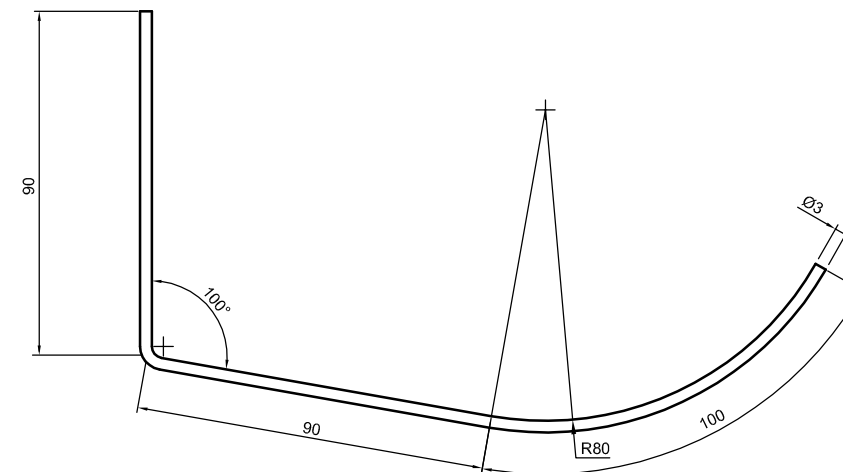
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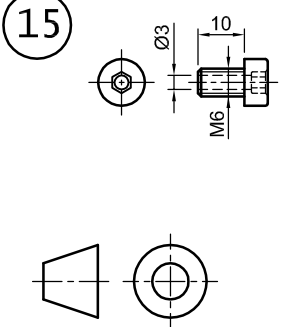
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14



15



| PARTS LIST | | | |
|--------------------|---|------|---|
| Part | Part Name | Req. | Material and Description |
| 1 | Top Cover | 1 | 3 mm, Clear Acrylic (polished) |
| 2 | Central Cover | 1 | 1.5 mm, Aluminium (polished or painted) |
| 3 | Gearbox Coupling | 1 | Ø10 mm, Brass (polished) |
| 4 | Slotted Link Support | 1 | Ø20 mm, Nylon (polished) |
| 5 | Slotted Link | 1 | 3 mm, Aluminium (polished) |
| 6 | Chassis | 1 | 1.5 mm, Aluminium (polished or painted) |
| 7 | Top Motor Spacer | 1 | 2 mm, Aluminium (polished) |
| 8 | Search Light Holder | 1 | 1 mm, Aluminium (polished or painted) |
| 9 | Micro-switch Clamp | 1 | Aluminium Angle (polished) |
| 10 | Sensor Arm Pivot | 1 | 10 × 10 mm, Aluminium (polished) |
| 11 | Crank Arm | 1 | 3 mm, Aluminium (polished) |
| 12 | Sliding Pin | 1 | Ø6 mm, Brass (polished) |
| 13 | Search Light Support Column | 1 | Ø8 mm, Brass (polished) |
| 14 | Sensor Arm | 1 | Ø3 mm, Aluminium Rod (polished) |
| 15 | Support Column Screw | 1 | M6 × 10, Allen Head, Note: Mild Steel |
| As Supplied | | | |
| 16 | Screw | 4 | M3 × 8, Pan Head or Allen Button Head, Steel |
| 17 | Screw | 6 | M3 × 25, Pan Head or Allen Button Head, Steel |
| 18 | Screw (Switch Clamp, Sliding Pin & Pivot) | 3 | M4 × 16, Pan Head or Allen Button Head, Steel |
| 19 | Screw (Crank Arm to Coupling & Light Support) | 2 | M4 × 10, Pan Head or Allen Button Head, Steel |
| 20 | Screw | 1 | M6 × 40, Allen Head, Steel |
| 21 | Screw | 1 | M4 × 35, Pan Head or Allen Button Head, Steel |
| 22 | Grub Screw (Coupling ×2, Pivot ×1) | 3 | M4 × 4 |
| 23 | Nut | 10 | M3, Steel |
| 24 | Nut | 5 | M4, Steel |
| 25 | Nut | 1 | M6, Nylock |
| 26 | 3V Motorised Gearbox | 3 | In-Line Motor / Ratio 110:1 |
| 27 | Motor Bracket | 2 | As Supplied |
| 28 | Wheel | 2 | Ø68 mm × 25 mm, to suit gearbox spigot |
| 29 | Castor + M8 Nut | 1 | Ø40 mm, with M8 × 8 mm spindle |
| 30 | Battery Holder | 2 | AA × 1 |
| 31 | Switch | 2 | Toggle & Micro-switch with Roller Lever |
| 32 | LED + Holder | 1 | As supplied |
| 33 | Resistor | 1 | 330Ω |
| 34 | Insulated Wire | | As required |

Note: 20% of the marks will be awarded for **Assembly, Finish and Function.**