



Coimisiún na Scrúduithe Stáit
State Examinations Commission

JUNIOR CERTIFICATE EXAMINATION, 2020

METALWORK

TECHNIQUES AND DESIGN – PROJECT – HIGHER LEVEL

150 marks

PROJECT MUST BE COMPLETED BY Friday 3rd April, 2020

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/metalwork2020>

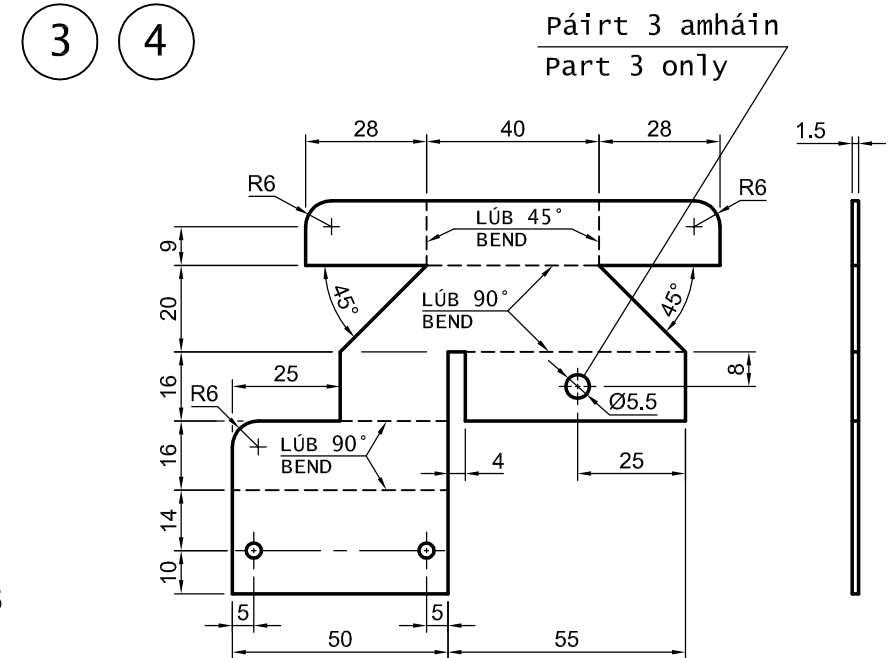
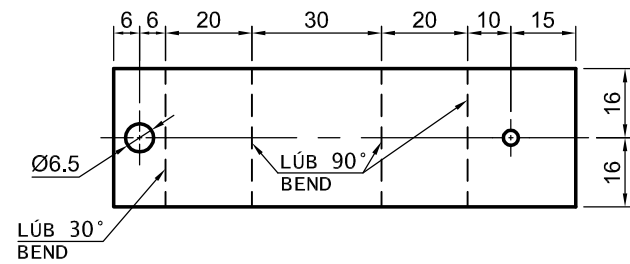
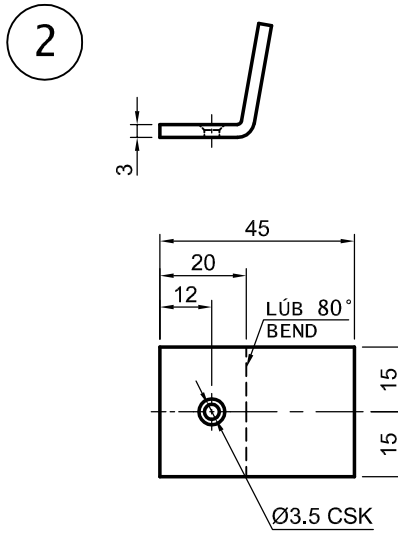
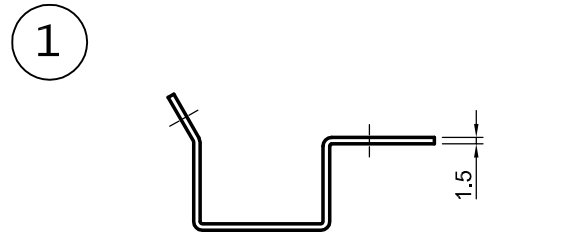
Instructions for making the project

1. Details of a **Model Vintage Tractor** 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 **Tipping Transport Box** for the rear of the model. Your design solution must include a method to secure the box until tipping is required.
Your design solution may include adjustments to already manufactured components.
(Note: 20% of the marks will be awarded for this section.)
4. You must bond the **Battery Holder (Part 31)** to the underside of the **Seat Support (Part 1)**.
5. Complete, **test** and **solder** the **Electric Circuit**.
6. Your **Examination Number** must be clearly engraved in the position indicated on the drawing.
7. Your completed project, clearly identified with your **Examination Number**, must be available to the visiting examiner **along with the necessary testing equipment**.

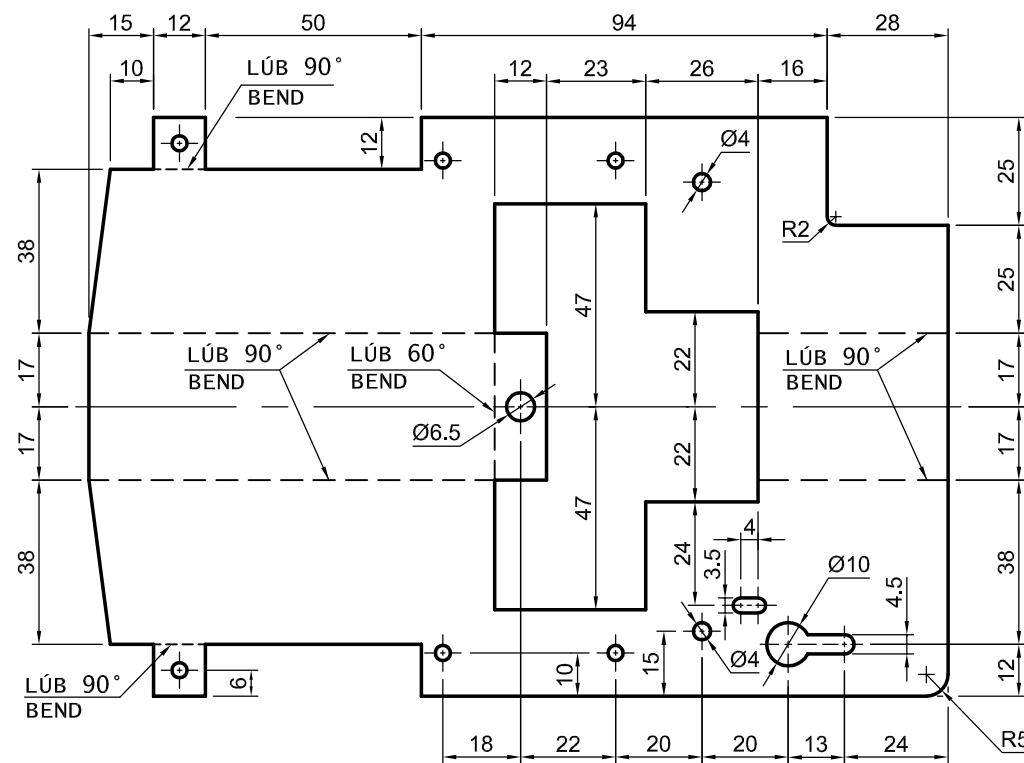
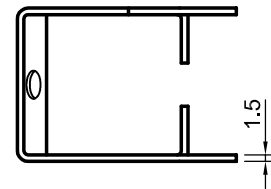
Poill gan toisí $\varnothing 3.5$
 Undimensioned holes $\varnothing 3.5$

Nóta: Gabhann 20% de na marcanna le Cóimeáil, Bailchríoch agus Feidhmiú.

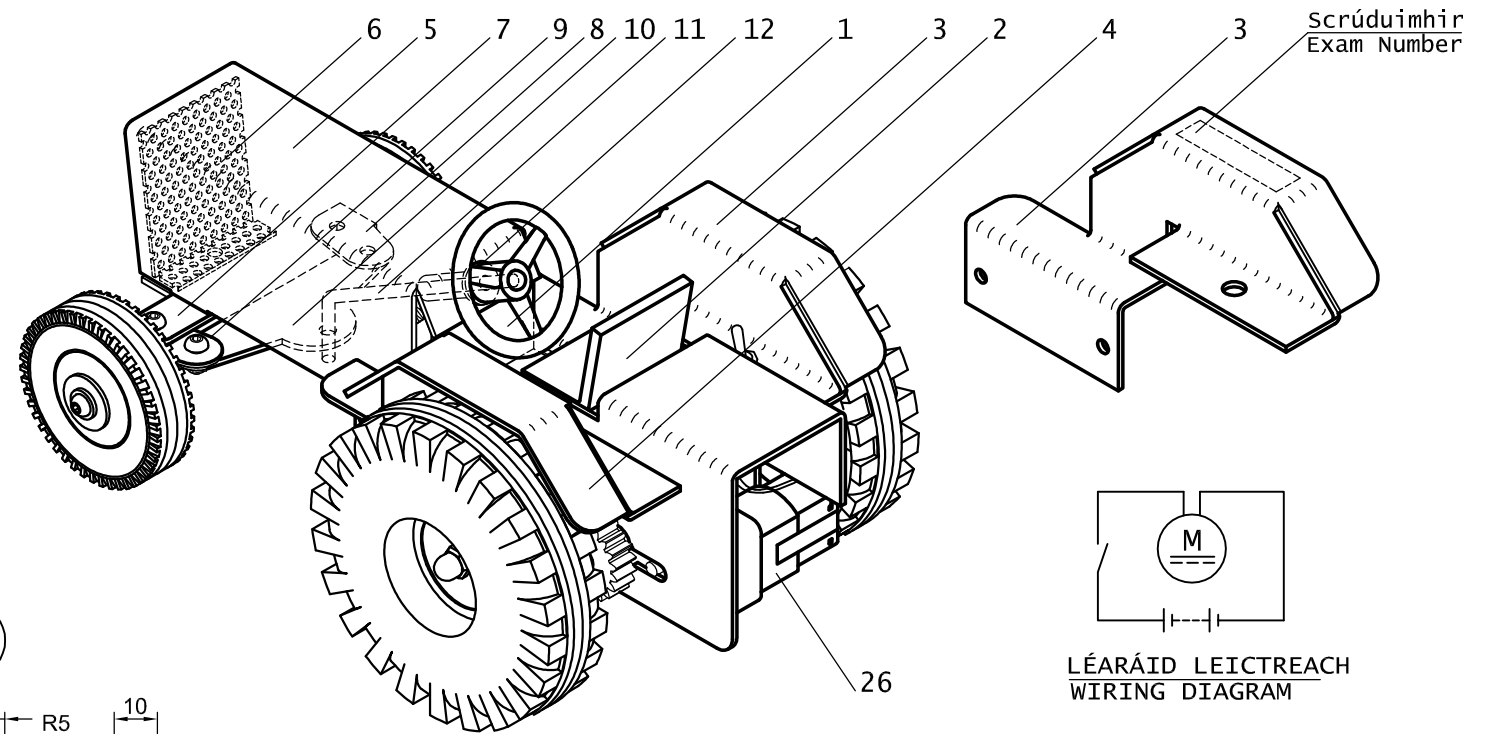
Note: 20% of the marks will be awarded for Assembly, Finish and Function.



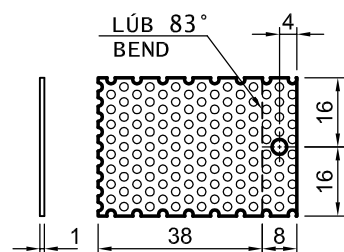
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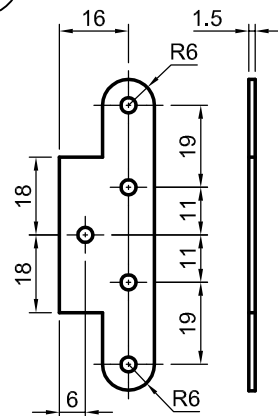
SONRAÍ CÓIMEÁLA
 ASSEMBLY DETAILS



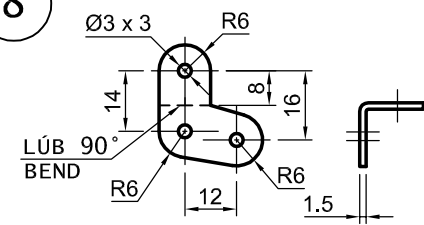
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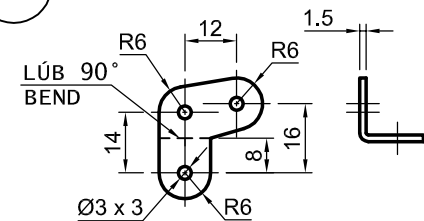
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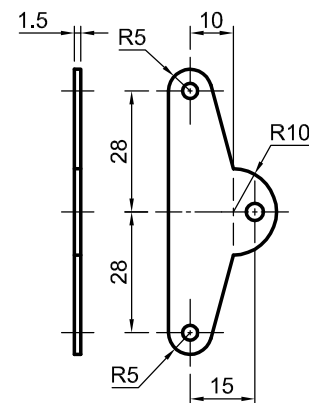
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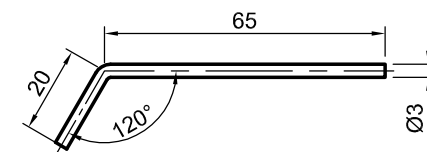
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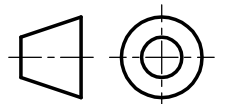
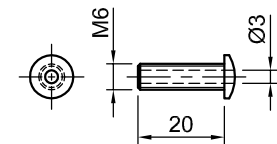
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Parts List			
Part No.	Part Name	Required	Material and Description
1	Seat Support	1	1.5 mm, Aluminium (polished)
2	Seat	1	3 mm, Coloured Acrylic (polished)
3	Right Mudguard	1	1.5 mm, Aluminium (polished or painted)
4	Left Mudguard	1	1.5 mm, Aluminium (polished or painted)
5	Main Frame	1	1.5 mm, Aluminium (polished or painted)
6	Grill	1	1 mm, Perforated Aluminium (polished)
7	Grill Support	1	1.5 mm, Aluminium (polished)
8	Right Axle Support	1	1.5 mm, Brass (polished)
9	Left Axle Support	1	1.5 mm, Brass (polished)
10	Steering Rack	1	1.5 mm, Brass (polished)
11	Steering Column	1	Ø3 mm, Steel Rod (polished)
12	Steering Column Support	1	M6 × 20 Mild Steel Screw
As Supplied			
13	Screw (Mudguard)	4	M3 × 6, Allen Button Head or Pan Head, Steel
14	Screw	7	M3 × 8, Allen Button Head or Pan Head, Steel
15	Screw (Seat)	1	M3 × 8, Allen CSK Head
16	Screw (Motor)	1	M3 × 20, Allen Button Head or Pan Head, Steel
17	Screw (Front Axle)	2	M3 × 25, Allen Button Head or Pan Head, Steel
18	Nut	10	M3, Steel
19	Nylock Nut	7	M3, Steel
20	Nut (Rear Axle)	4	M4, Steel
21	Nylock Nut (Rear Axle)	1	M4, Steel
22	Cap Nut	2	M4, Steel
23	Nut	1	M6, Steel
24	Steering Wheel	1	As Supplied
25	Rear Axle	1	M4 Threaded Bar (115 mm approximately)
26	3V Motorised Gearbox	1	Perpendicular Motor, Single Shaft – Ratio 120:1
27	Motor Gear	1	20 Teeth (To suit gearbox spigot – with screw)
28	Axle Gear	1	20 Teeth, with 4 mm axle hole
29	Front Wheel	2	Ø45 mm × 10 mm, with 3 mm axle hole
30	Rear Wheel	2	Ø79 mm × 20 mm, with 4 mm axle hole
31	Battery Holder	1	2 × AAA
32	Switch	1	Toggle
33	Insulated Wire		As Supplied

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