



Coimisiún na Scrúduithe Stáit
State Examinations Commission

JUNIOR CERTIFICATE EXAMINATION, 2021

METALWORK

TECHNIQUES AND DESIGN – PROJECT – HIGHER LEVEL

150 marks

PROJECT MUST BE COMPLETED BY Friday 26 March, 2021

PLEASE READ CAREFULLY

General Instructions to candidates

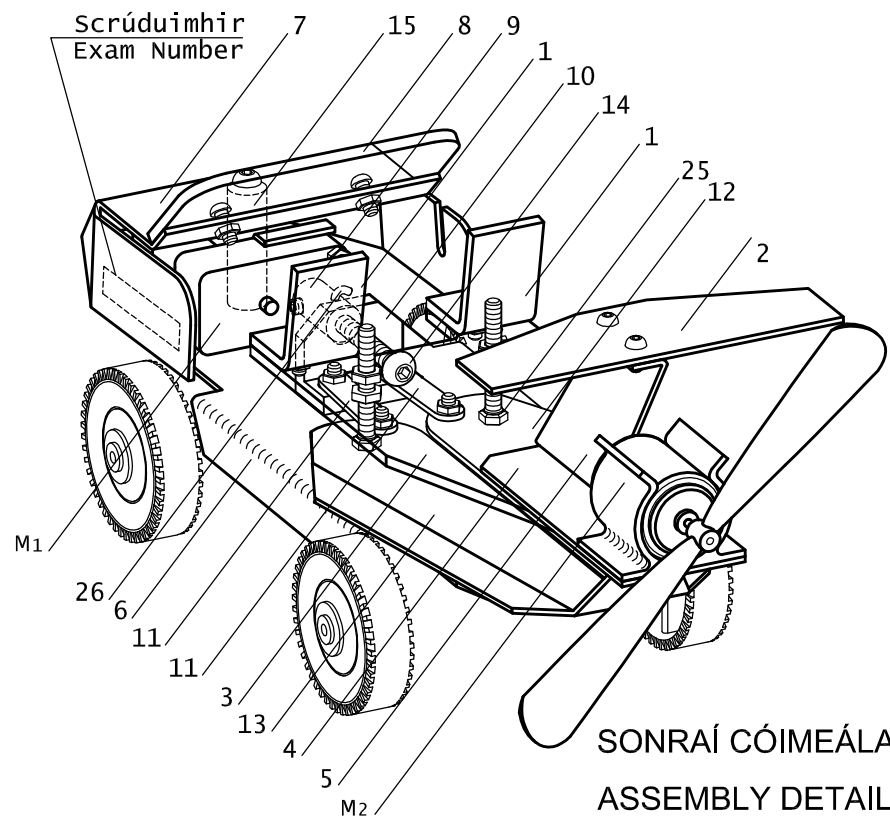
The project you make and submit for examination, including the design element, must be **your own individual work**, carried out in the school under the supervision of the teacher.

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

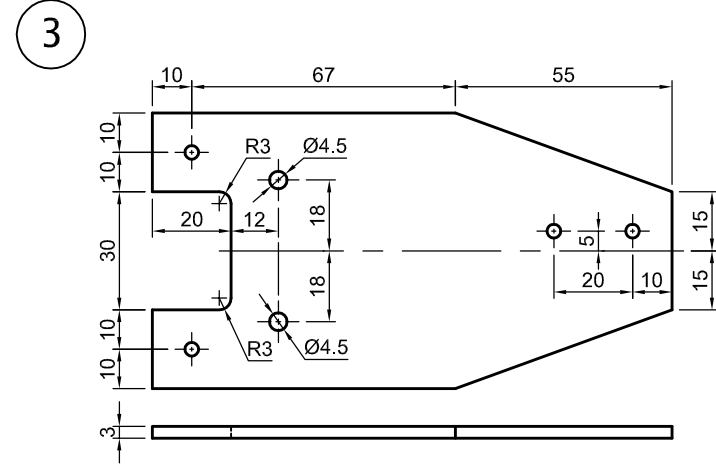
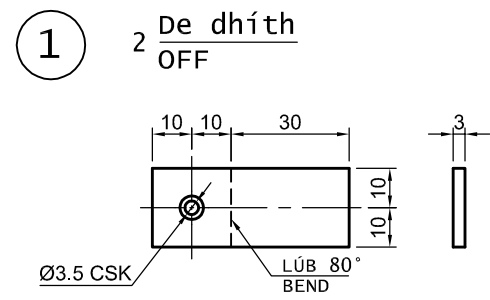
Note: For further information on this project please see the video at the URL shown below.
<https://www.examinations.ie/video/index.php/metalwork2021>

Instructions for making the project

1. Details of a **Model Aeromobil** are shown on the accompanying drawing.
2. Make and assemble the Project using the materials specified in the **Parts List**.
3. **(i)** Design and make a **Control Console** for the model. The control console must contain the switches (**Parts 33 and 34**) and a means to secure the **Battery Holder (Part 35)**.
It should be attached to the model using the ribbon cable supplied.
- (ii)** Design, make and attach **Front and Rear Axles** for the model **and** an **Axle Support** for each axle.
(Use 3 mm axle rods). (**Note: 20% of the marks will be awarded for this section.**)
4. **Note:** When operating the wings, care should be taken to ensure that they only extend to approximately 80° to the edge of the chassis. They should retract/close to a position which is parallel to the edge of the chassis.
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**.



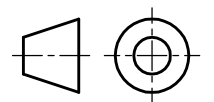
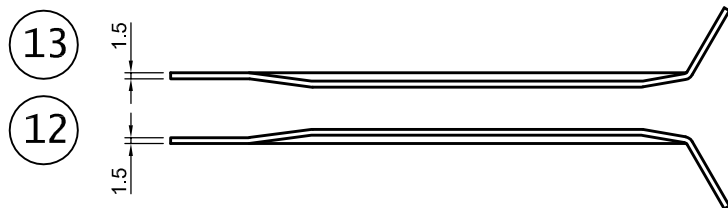
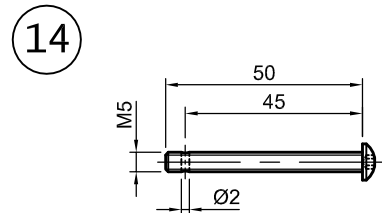
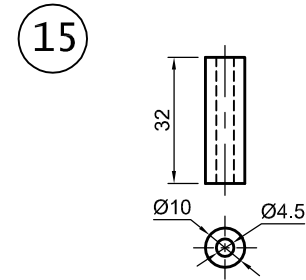
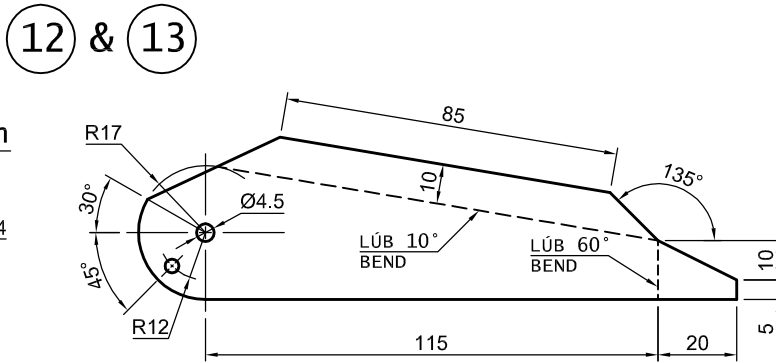
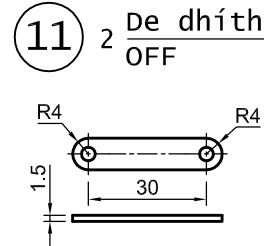
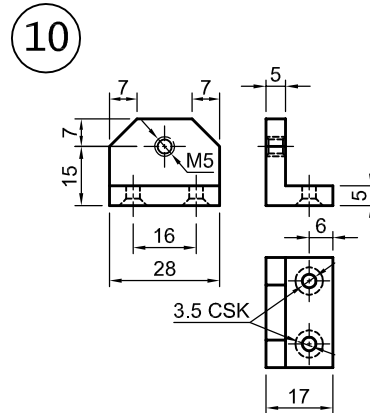
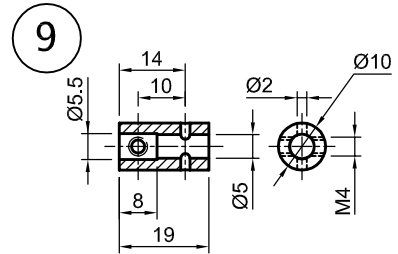
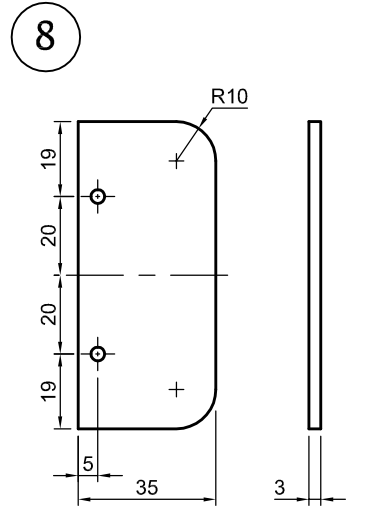
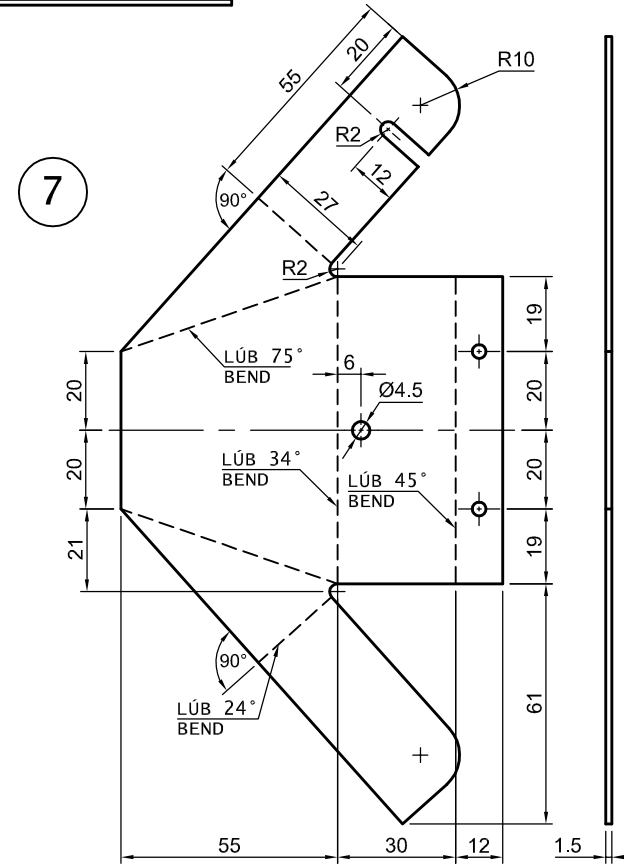
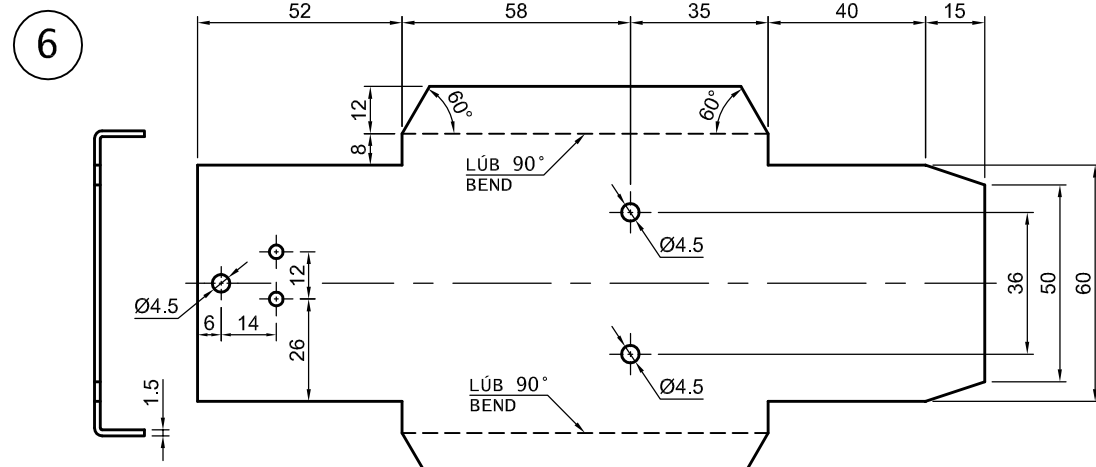
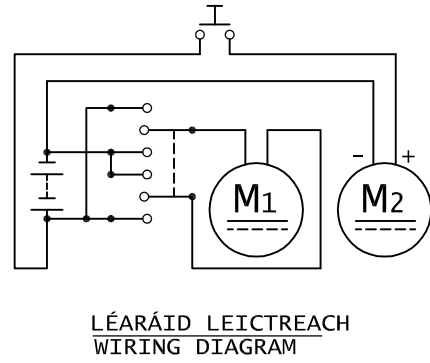
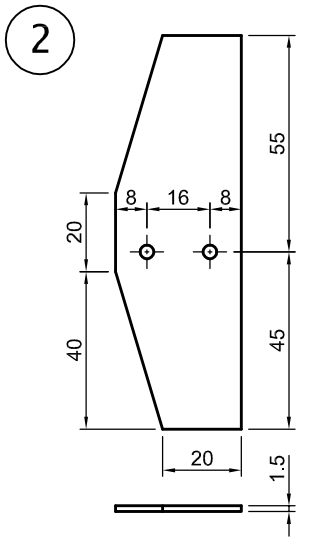
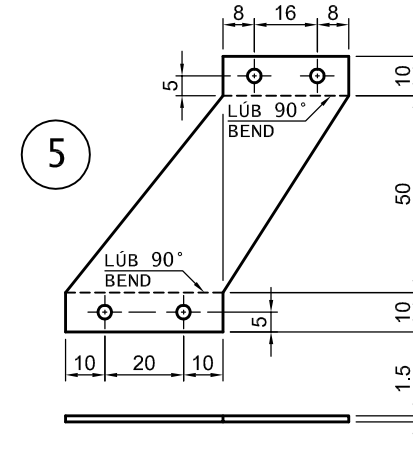
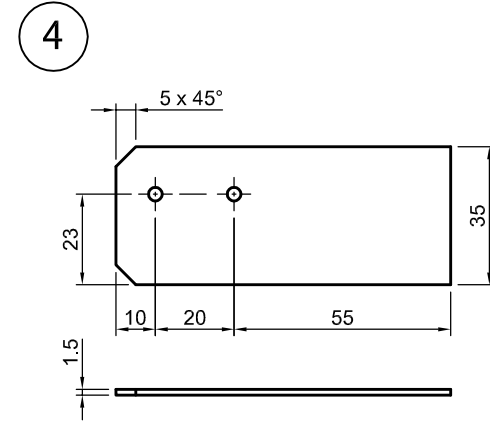
SONRAÍ CÓIMEÁLA
ASSEMBLY DETAILS



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

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

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



Parts List			
Part No.	Part Name	Required	Material and Description
1	Seat	2	3 mm, Acrylic (polished)
2	Tailplane	1	1.5 mm, Aluminium or Brass (polished)
3	Cover	1	3 mm, Acrylic (polished)
4	Rear Motor Support	1	1.5 mm, Aluminium (polished)
5	Fin	1	1.5 mm, Aluminium (polished)
6	Chassis	1	1.5 mm, Aluminium (polished)
7	Nose / Bonnet	1	1.5 mm, Aluminium (polished)
8	Windscreen	1	3 mm, Clear or Tinted Acrylic (polished)
9	Coupling	1	Ø10 mm, Aluminium or Brass (polished)
10	Sliding Block	1	5 mm, Aluminium Angle (polished)
11	Link	2	1.5 mm, Aluminium or Brass (polished)
12	Right Wing	1	1.5 mm, Aluminium (polished)
13	Left Wing	1	1.5 mm, Aluminium (polished)
14	Drive Screw	1	M5 x 50, Mild Steel or Brass
15	Support	1	Ø10 mm, Aluminium (polished)
As Supplied			
16	Screw	8	M3 x 8, Allen Button Head or Pan Head, Steel
17	Screw (Rear Motor Support)	2	M3 x 10, Allen Button Head or Pan Head, Steel
18	Screw	4	M3 x 12, Allen CSK Head, Steel
19	Screw (Perpendicular Motor)	2	M3 x 20, Allen Button Head or Pan Head, Steel
20	Grub Screw	2	M4 x 4
21	Screw	3	M4 x 40, Allen Button Head or Pan Head, Steel
22	Nut	12	M3, Steel
23	Nylock Nut (Link)	4	M3, Steel
24	Nut	7	M4, Steel
25	Nylock Nut	2	M4, Steel
26	Shear Pin	1	Ø0.7 mm – Ø1.0 mm x 30 mm, Soft Solder
27	Wheel (Push fit)	4	Ø44 mm x 15 mm, with 3mm axle hole
28	3V Motorised Gearbox (M1)	1	Perpendicular Motor, Single Shaft – Ratio 120:1
29	Motor Bracket	1	To suit Perpendicular Motor
30	Motor (M2)	1	High torque, Ø24 x 30 mm
31	Motor Holder	1	Self-adhesive type for Part 30
32	Propeller	1	Ø130 mm (2 Blade to suit Part 30)
33	Switch	1	DPDT
34	Switch	1	Push to Make
35	Battery Holder	1	AA x 4
36	Insulated Wire/Ribbon Cable		As Required

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