



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Cycle Examination 2026

Engineering

Project Coursework
Common Level

To be completed by Friday 17 April, 2026

210 marks

Instructions to Candidates

1. The project coursework for Junior Cycle Engineering consists of the:
 - manufacture of a **Model RoboCoaster** – 210 marks.
2. Please familiarise yourself with the adjusted assessment arrangements for candidates taking the state examinations in the 2025/26 school year, that were issued by the Department of Education and Youth. As a result of these adjustments the '*Design Element*' of this coursework, consisting of a Design Brief, Design Folio and Design Realisation, is not examinable and will not have marks allocated to it in 2026. Therefore, candidates are not required to complete this element of the coursework.
3. As a result of these changes, the total mark allocation for this coursework in 2026 is 210 marks, instead of the usual 280 mark total. However, the relative weighting between the coursework (70%) and the written paper (30%) will be retained. This will be achieved by reweighting the coursework mark before it is combined with the mark for the written component.
4. Details of the **Model RoboCoaster** are shown on the accompanying drawings, pages 4 – 6.
5. Make and assemble the model using the materials specified in the **Parts List** (page 7).
6. The **Battery Holders** (Part 41) must be bonded to the:
 - **Base** (Part 1)
 - **Side Panel Support** (Part 6)

The **Magnets** (Part 44) must be bonded to the back of the **Seat** (Part 5).
The **Standoff** (Part 32) must be free to rotate in the **Beam pivot** (Part 15).
7. Assemble, test and solder the Electric Circuits and include AA batteries with your model for testing by the examiner.
8. Your **Examination Number** must be clearly shown, on the model, in the position indicated on the drawing (page 4).
9. An outline marking allocation is shown on page 8.
10. Your completed coursework must be available for assessment by **Friday 17 April, 2026**.
11. **Note:** So as to authenticate **your own individual work**, where CAM processes are used (e.g. Laser cutting and CNC lathe work), each individual part must be supported by the inclusion of an appropriate CAD drawing and identified by your examination number.
12. **Note: If you use machinery other than that specified in the Department of Education and Youth Engineering Room Equipment List, to process any part of the examination material, you will lose marks under the relevant headings in the marking scheme.**
13. For further information on this project please see the video at the URL shown below.
<https://www.examinations.ie/video/index.php/JCEngineering2026>

Acceptance and Authentication of Coursework (See circular S76/22)

1. The coursework you submit for assessment must be **your own individual work** and must be completed in school under the supervision of your teacher.
2. Your model must not be removed from the school under any circumstances, as doing so may result in the coursework being considered invalid and no marks will be awarded.
3. **Note:** So as to authenticate your own individual work, where specialist processes are used (e.g. Laser cutting and CNC lathe work), each individual piece must be supported by the inclusion of an appropriate CAD drawing and identified by your examination number.
4. You must reference and acknowledge all research sources used such as: publications including books, professional journals and government reports; online sources and other types of media; any material generated using artificial intelligence (AI) software or applications; and material from specialist organisations and relevant individuals. To include such material without properly referencing the source will be considered plagiarism. In addition, the copying from, or reproduction of, material from such sources may also be considered plagiarism.
5. Any case of suspected copying, plagiarism (which includes the use of AI software), improper assistance, or procurement of work prepared by another party will be thoroughly investigated.
6. **Note:** It is your responsibility, as the candidate, to comply with these instructions. If you fail to comply with these instructions, your teacher will not be able to validate and sign off on your coursework and you will not receive any marks for it.

Note:

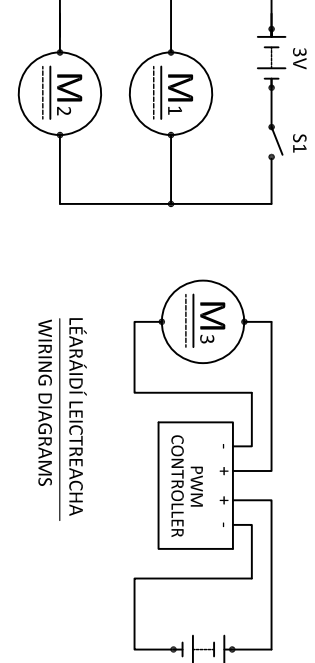
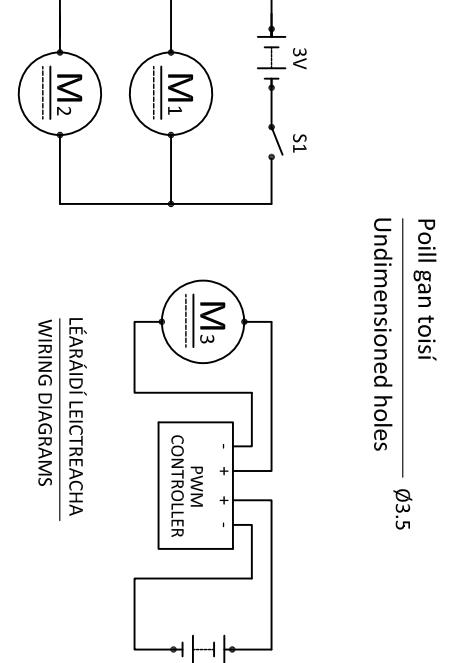
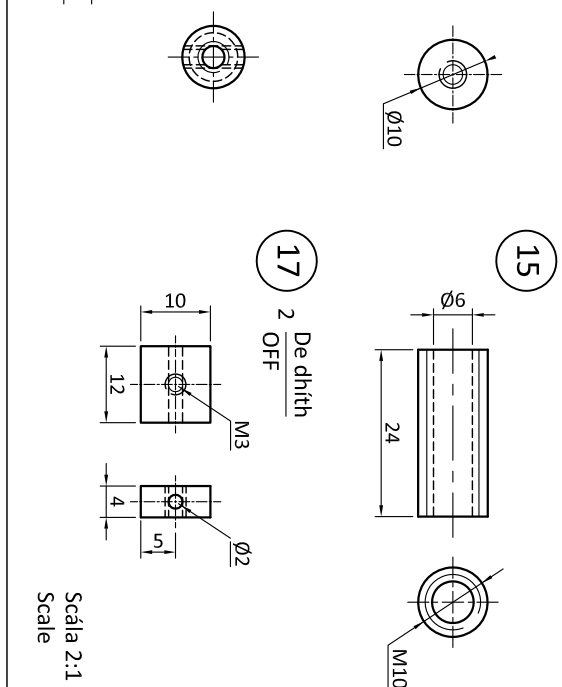
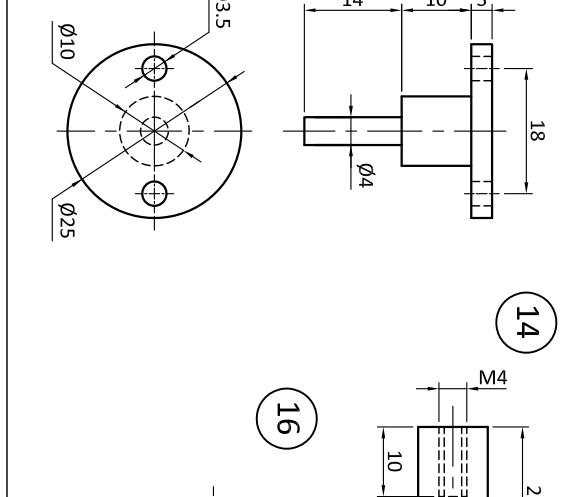
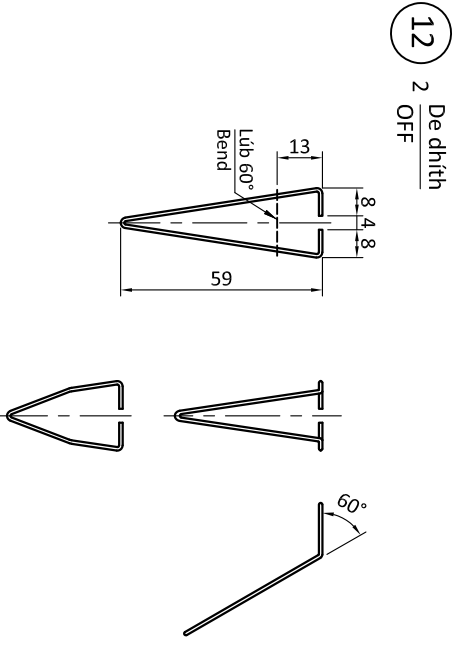
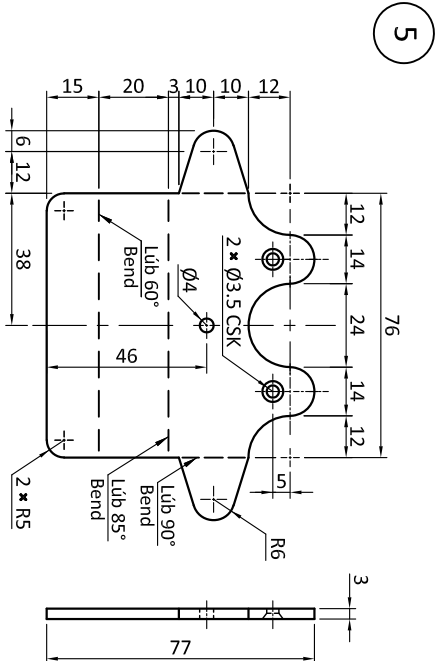
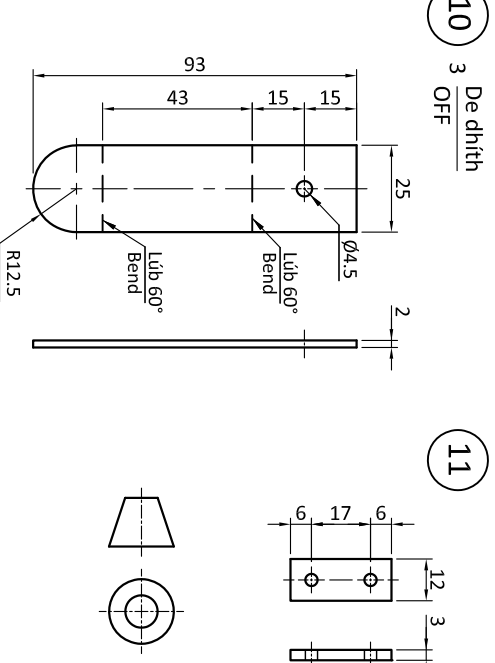
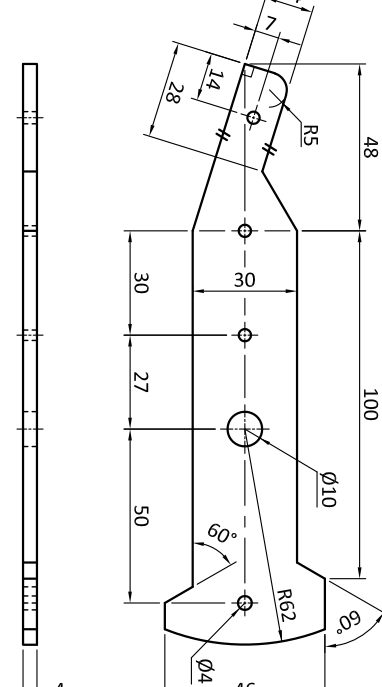
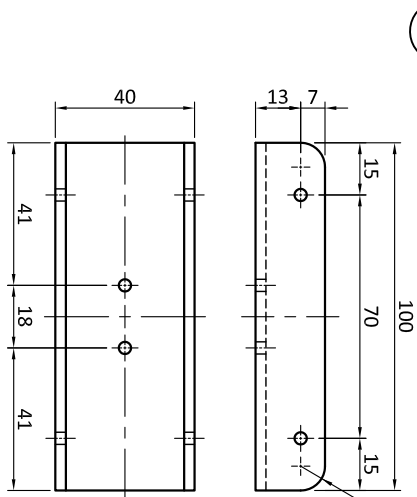
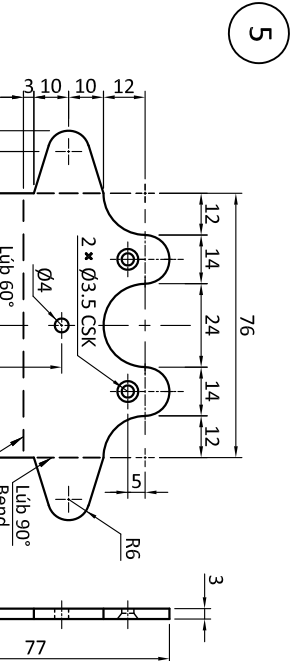
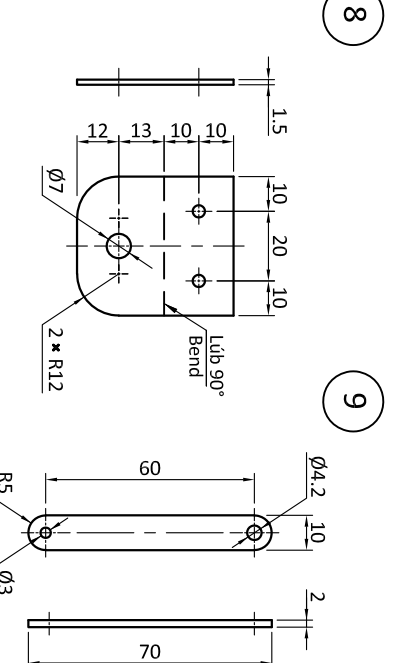
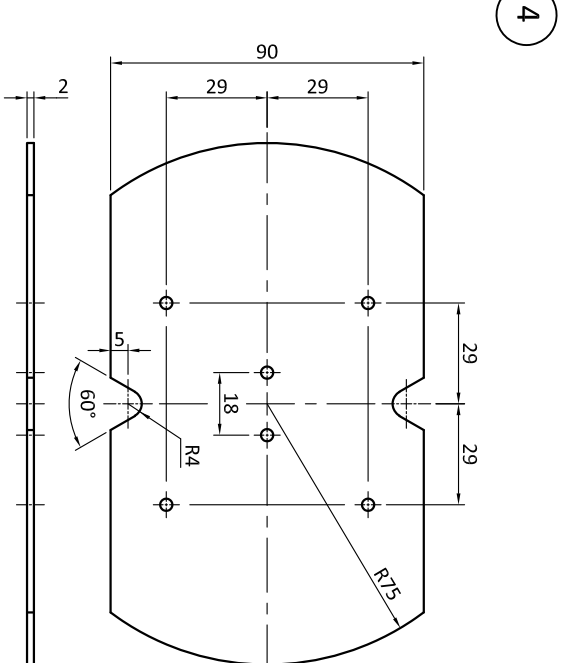
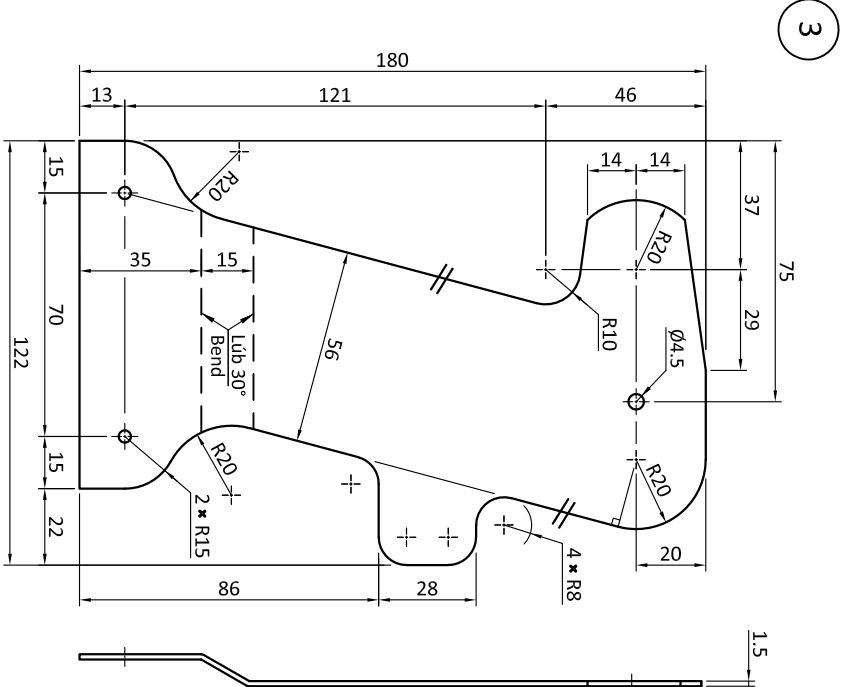
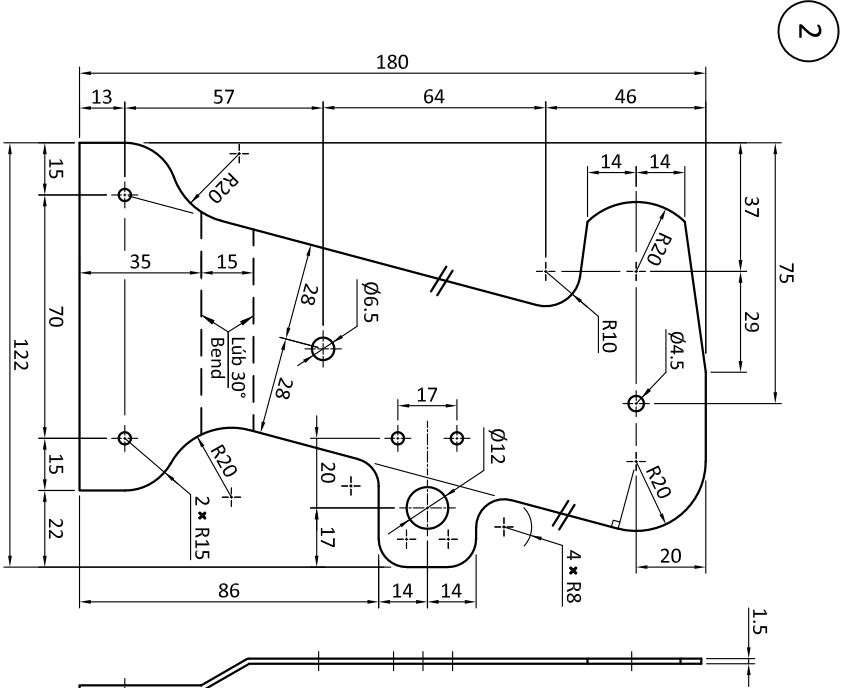
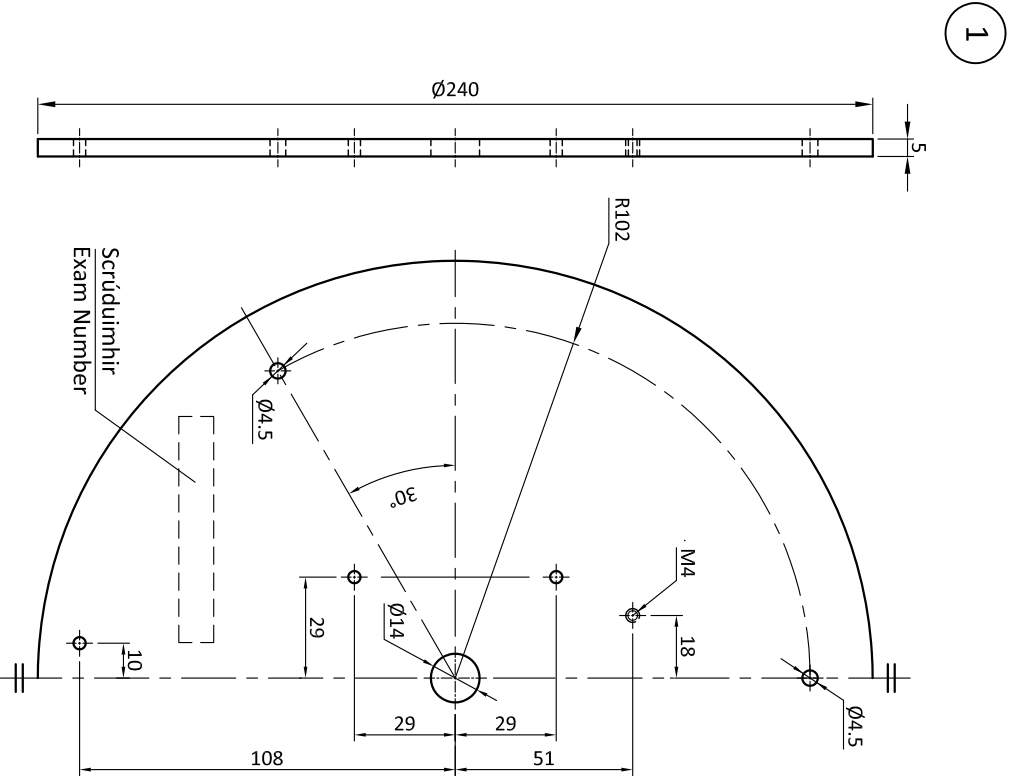
- *The circumstances in which the Minister for Education and Youth may withhold marks from candidates are set out in the “Rules and Programme for Secondary Schools”.*
- *Anyone who helps a candidate to break examination rules can be prosecuted under the Education Act 1998.*

Note to Teachers

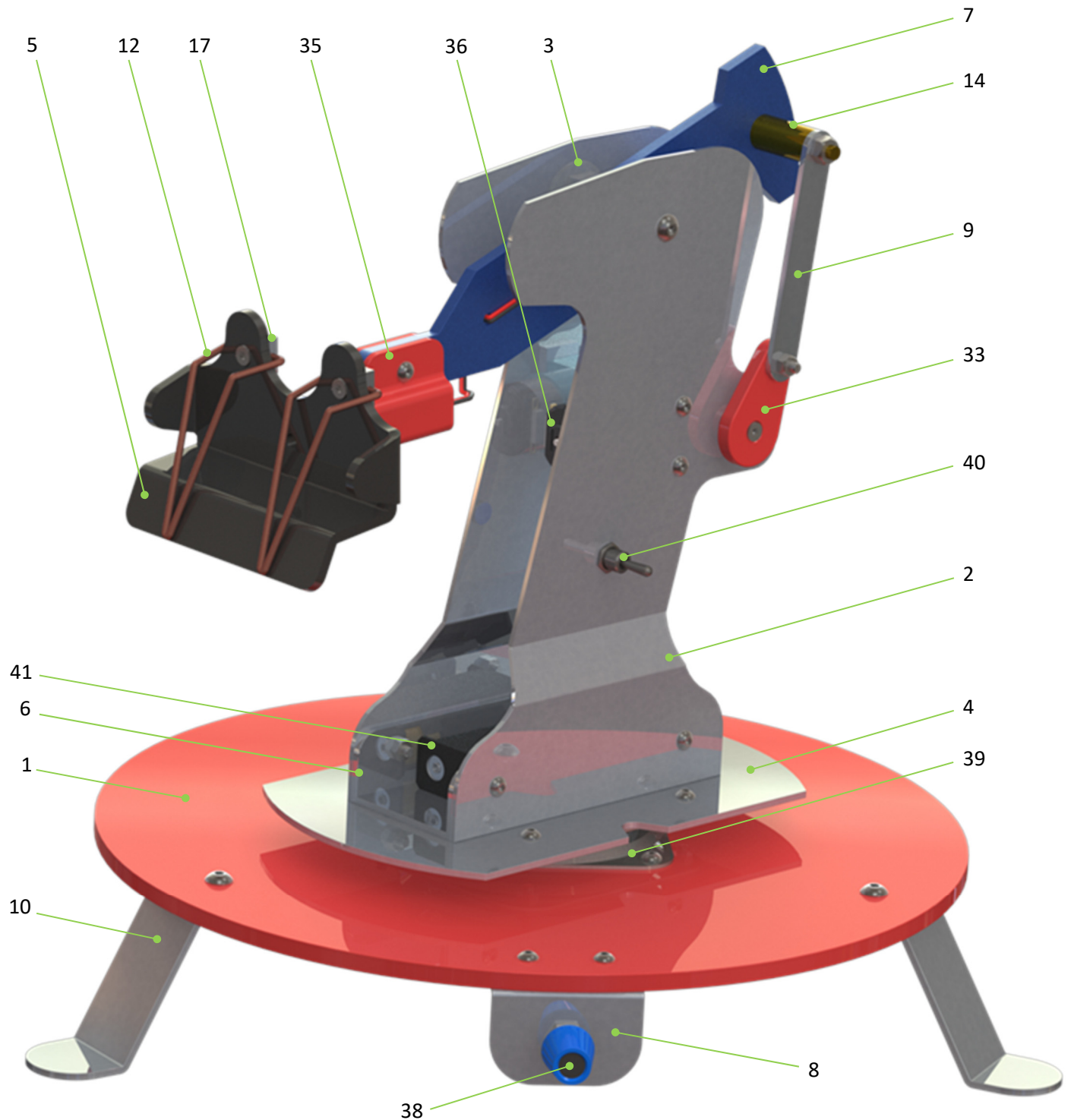
Storage of Coursework

On completion of the coursework, school authorities should ensure that the finished model is retained in a secure place until the examining process (including appeals) has concluded.

- * **Beam** (Part 7) may be finished using paint or polish.
- ** A **centering ring** should be manufactured to ensure that the **Drive Shaft** (Part 13) is centered with the **Lazy Susan Bearing** (Part 39).
- *** **Crank** (Part 33), **Rotation Motor Holder** (Part 34) and **Seat Motor Holder** (Part 35)
 - Schools may choose to 3D print these components or make alternative arrangements to source these components.
 - The STL Files for 3D printing these components are available to download on the SEC website at the URL shown below.
<https://www.examinations.ie/video/index.php/JCEngineering2026>



Model RoboCoaster – Assembly Drawing



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

<https://www.examinations.ie/video/index.php/JCEngineering2026>

PARTS LIST			
Part No.	Part Name	Required	Material and Description
1	Base	1	5 mm, Coloured Acrylic (polished)
2	Side Panel (left)	1	1.5 mm, Aluminium (polished)
3	Side Panel (right)	1	1.5 mm, Aluminium (polished)
4	Platform	1	2 mm, Aluminium (polished)
5	Seat	1	3 mm, Coloured or Tinted Acrylic (polished)
6	Side Panel Support	1	20 × 40 × 20 × 3 mm, Aluminium U-Channel (polished)
7	Beam	1	4 mm, Aluminium *(see note page 3)
8	Controller Bracket	1	1.5 mm, Aluminium (polished)
9	Connecting Rod	1	10 × 2 mm, Aluminium or Brass (polished)
10	Leg	3	25 × 2 mm, Aluminium (polished)
11	Crank Motor Spacer	1	12 × 3 mm, Aluminium (polished)
12	Harness	2	Ø1.6 mm, Steel rod (copper coated)
13	Drive Shaft	1	Ø25 mm, Aluminium (polished) **(see note page 3)
14	Connecting Rod Support	1	Ø10 mm, Brass (polished)
15	Beam Pivot	1	M10, Mild Steel or Brass threaded bar
16	Seat Motor Coupler	1	Ø3 mm to Ø3 mm, with grub screws - as supplied
17	Harness Support	2	12 × 4 mm, Aluminium (polished)
As Supplied			
18	Screw (Parts 4 & 39)	4	M3 × 6, Allen Button Head or Pan Head, Steel
19	Screw (Parts 2, 3 & 6)	4	M3 × 8, Allen Button Head or Pan Head, Steel
20	Screw	9	M3 × 10, Allen Button Head or Pan Head, Steel
21	Screw (Parts 2, 11 & 36)	2	M3 × 25, Allen Button Head or Pan Head, Steel
22	Screw (Parts 5 & 17, 33)	3	M3 × 6, CSK head, Steel
23	Screw (Parts 9 & 33)	1	M3 × 12, CSK head, Steel
24	Screw (Parts 34 & 36)	2	M3 × 30, CSK head, Steel
25	Screw (Parts 1 & 34)	2	M4 × 8, Allen Button Head or Pan Head, Steel
26	Screw	7	M4 × 10, Allen Button Head or Pan Head, Steel
27	Nut	21	M3, Steel
28	Nut (Parts 1 & 10)	3	M4, Steel
29	Nyloc Nut (Parts 9 & 33)	1	M3, Steel
30	Nyloc Nut (Parts 9 & 14)	1	M4, Steel
31	Flange Nut (Part 15)	2	M10, Steel
32	Standoff - Round	1	M4 × 6 × 25 mm, Steel (ID M4, OD 6 mm, length 25 mm).
33	Crank	1	3D printed *** (see note page 3)
34	Rotation Motor Holder	1	3D printed *** (see note page 3)
35	Seat Motor Holder	1	3D printed *** (see note page 3)
36	3V Motorised Gearbox	2	TT Motor Bi-metal gearbox - DC 3V to 6V (ratio of 1:90)
37	Seat Motor	1	N20 Micro Gear Motor DC 3V - 50 RPM with metal gearbox (Output shaft - Ø3 mm × 10 mm long)
38	Rotation Motor Controller	1	DC 1.8V - 15V PWM motor speed controller module with speed controller potentiometer knob switch
39	Lazy Susan Bearing	1	3-inch Lazy Susan bearing, (approximately 72 mm × 72 mm × 9 mm with 58 mm between Ø4 mm hole centres)
40	Switch (S1)	1	SPST toggle
41	Battery Holder	2	AA × 2 battery holder with leads
42	Precision Fit Plastic Gear	1	Ø21.5 mm, 20 teeth – to fit TT motor
43	Plastic Gear with Hub	1	Ø41.5 mm, 40 teeth – to fit 4 mm shaft
44	Magnets	2	Extra strong magnets – Ø8 mm × 4 mm

Outline Marking Allocation

The table below gives an outline of the marking headings that will be used to assess your completed coursework. While the general headings and marks below will largely remain the same, mark allocations may vary depending on the actual project and 'Design Element' for any given year.

Model RoboCoaster – Outline Marking Allocation		
Section 1: Manufacture		
Headings	Marks	
Parts 1 & 8	15	
Parts 2 & 11	15	
Part 3	10	
Parts 4 & 13	15	
Parts 5 & 16	10	
Part 6	10	
Parts 7 & 15	15	
Part 10	15	
Parts 9 & 14	10	
Parts 12 & 17	15	
Section 1 - Total		130
Section 2: Complete Model		
Headings	Marks	
Assembly	20	
Finish	20	
Mechanical Function	20	
Electrical Function	20	
Section 2 - Total		80
Section 3: 'Design Element' (Not required for 2026 – See page 2)		
Section 3 – Total		-
Overall Total in 2026		210