



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate 2015

Marking Scheme

Technology Tasks

Ordinary and Higher Level

Note to teachers and students on the use of published marking schemes

Marking schemes published by the State Examinations Commission are not intended to be standalone documents. They are an essential resource for examiners who receive training in the correct interpretation and application of the scheme. This training involves, among other things, marking samples of student work and discussing the marks awarded, so as to clarify the correct application of the scheme. The work of examiners is subsequently monitored by Advising Examiners to ensure consistent and accurate application of the marking scheme. This process is overseen by the Chief Examiner, usually assisted by a Chief Advising Examiner. The Chief Examiner is the final authority regarding whether or not the marking scheme has been correctly applied to any piece of candidate work.

Marking schemes are working documents. While a draft marking scheme is prepared in advance of the examination, the scheme is not finalised until examiners have applied it to candidates' work and the feedback from all examiners has been collated and considered in light of the full range of responses of candidates, the overall level of difficulty of the examination and the need to maintain consistency in standards from year to year. This published document contains the finalised scheme, as it was applied to all candidates' work.

In the case of marking schemes that include model solutions or answers, it should be noted that these are not intended to be exhaustive. Variations and alternatives may also be acceptable. Examiners must consider all answers on their merits, and will have consulted with their Advising Examiners when in doubt.

Future Marking Schemes

Assumptions about future marking schemes on the basis of past schemes should be avoided. While the underlying assessment principles remain the same, the details of the marking of a particular type of question may change in the context of the contribution of that question to the overall examination in a given year. The Chief Examiner in any given year has the responsibility to determine how best to ensure the fair and accurate assessment of candidates' work and to ensure consistency in the standard of the assessment from year to year. Accordingly, aspects of the structure, detail and application of the marking scheme for a particular examination are subject to change from one year to the next without notice.



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate Examination, 2015

Technology Tasks
Ordinary & Higher Level

PV Tilt and Turn Mount

A

Design and make a model of a unit on which a domestic photovoltaic cell (PV) could be mounted. The unit must be capable of rotating and of tilting so that the PV can be adjusted to face the sun. One of these movements must be electro-mechanical and must include limit switching.

Ordinary Level Folder

<i>Analysis of brief</i>	Design should incorporate the following features: Tilt and turn mount for a Solar Cell. One movement must be electro-mechanical & include limit switching.	5
<i>Investigation of possible solutions</i>	Evidence of investigation: (sketches, photos, etc.) Various types of tilt & turn devices and/or relevant mechanical/electronic systems.	5
<i>Design Ideas</i>	Tilt and turn solar cell mount incorporating electro-mechanical/electronic system: Sketch of one design shown.	6
<i>Criteria for selection of solution</i>	Valid justification of this idea (at least two reasons).	4
<i>Sketches /drawings for manufacture</i>	Manufacture drawing of the chosen solution and sub-system.	6
<i>Manufacturing sequence/processes</i>	Sequence of events for manufacture of the chosen solution.	5
<i>Testing and Evaluation</i>	Evidence of testing/modification during manufacture and/or evaluation against the brief/design specification and/or third party evaluation.	5
<i>Presentation of folder</i>	Layout: use of diagrams, sketches, photographs, neat and orderly.	4

Ordinary Level Product

<i>Product satisfies brief</i>	Is the product a working model of a tilt and turn solar cell mount with an electro-mechanical sub-system?	5
<i>Suitability, Functional</i>	Do all the necessary elements of the tilt and turn device function?	5
<i>Design/Inventiveness</i>	Inventive design of the tilt and turn device and sub-system?	5
<i>Originality, commercial comp.</i>	Creative use of materials/recycled parts/ electro-mechanical components/ mechanisms/colour/shape. Acceptable use of commercial components?	5
<i>Appropriateness of materials</i>	Materials selected suited to their respective functions?	5
<i>Appropriate sub-system(s)</i>	Appropriate electro-mechanical sub-system?	5
<i>App. manufacturing processes</i>	Complete tilt and turn device and sub-system manufactured using appropriate processes?	5
<i>Quality of processes</i>	Quality of the product after manufacture?	5
<i>Assembly</i>	Appropriate methods of assembly used? Quality of assembly.	5
<i>Detailed finish/Safety Considerations</i>	No sharp edges or safety hazards (loose parts, toxic paints etc.?)	5
<i>Tech. competencies/ Application of skills</i>	Appropriate level and range of skills/technological competencies?	5
<i>Overall presentation</i>	Attractive, well presented product?	5

PV Tilt and Turn Mount

A

Design and make a model of a unit on which a domestic photovoltaic cell (PV) could be mounted. The unit must be capable of rotating and of tilting so that the PV can be adjusted to face the sun. One of these movements must be electro-mechanical and must include limit switching.

Higher Level Folder

<i>Analysis of brief</i>	Problem posed by brief broken down into identifiable units? A. Design should incorporate the following features: Tilt & Turn PV Mount with an electro-mechanical/electronic element (0-3) B. Design specification generated/list of objectives..... (0-2) (Restate brief: Total mark = 1)	5
<i>Investigation of possible solutions</i>	Evidence of investigation/identification/research: (sketches, photos, etc.) A. Various types of Tilt & Turn devices, etc..... (0-3) B. electro-mechanical sub-system/electronic system..... (0-2)	5
<i>Design Ideas</i>	A. Tilt & Turn PV Mount Design 1 - well sketched & annotated (0-3) B. Tilt & Turn PV Mount Design 2 - well sketched & annotated (0-3)	6
<i>Criteria for selection of solution</i>	A. Selected design identified..... (0-2) B. Valid justification of selected design idea and sub-system..... (0-2)	4
<i>Sketches /drawings for manufacture</i>	Dimensioned/scaled drawings-sketches associated with manufacture. A. Detailed drawings of the chosen solution (0-3) B. Circuit drawings/Graphic of PIC circuit with inputs & outputs shown (0-3)	6
<i>Manufacturing sequence/processes</i>	A. Sequence of events for manufacture of the chosen solution..... (0-2) B. Materials list with sizes and costing (0-3)	5
<i>Testing and Evaluation</i>	A. Evidence of testing/modification during manufacture and/or evaluation against the brief/design specification and/or third party evaluation (0-3) B. Possible improvements identified..... (0-2)	5
<i>Presentation of folder</i>	A. Layout: use of diagrams, sketches, photographs, neat and orderly..... (0-3) B. Correct sequence of presentation as outlined in form S.67 (Design Tasks) ... (0-1)	4

Higher Level Product

<i>Product satisfies brief</i>	A. Is the product a tilt & turn PV mount? (0-3) B. Does it incorporate an electro-mechanical sub-system with limit switches?.. (0-2)	5
<i>Suitability, Functional</i>	A. Does the tilt & turn PV mount function? (0-3) B. Does the electro-mechanical system work? (0-2)	5
<i>Design/Inventiveness</i>	A. Inventive design of the tilt & turn mount and subsystem and/or mock-up of all or part of the solution? (model = 2)..... (0-5)	5
<i>Originality, commercial comp.</i>	A. Creative use of materials/recycled parts/electronic components, mechanisms, colour, shape. Acceptable use of commercial components?..... (0-5)	5
<i>Appropriateness of materials</i>	A. Materials selected suited to their respective functions? (strong, robust, rigid, etc.) (0-5)	5
<i>Appropriate sub-system(s)</i>	A. Appropriate electro-mechanical sub-system, reliable? (0-5) (Not working max. mark 4)	5
<i>App. manufacturing processes</i>	A. Tilt and turn mount manufactured using appropriate processes? (0-3) B. sub-system manufactured using appropriate processes?..... (0-2)	5
<i>Quality of processes</i>	A. Quality of tilt & turn mount after manufacture using stated processes?..... (0-3) B. Quality of the sub-system after manufacture? (0-2)	5
<i>Assembly</i>	A. Appropriate methods of assembly used? (0-3) B. Quality of assembly (0-2)	5
<i>Detailed finish/Safety Considerations</i>	A. No sharp edges or other safety hazards?..... (0-3) B. All parts well finished?..... (0-2)	5
<i>Tech. competencies/ Application of skills</i>	Does the product demonstrate that the candidate has an: A. Appropriate range & level of technological competencies? (PV mount) (0-3) B. Appropriate range & level of technological competencies? (sub-system)..... (0-2)	5
<i>Overall presentation</i>	A. Attractive well presented product? (0-4) B. Instructions for use (if needed), controls labelled?..... (0-1)	5

Conservatory Air Vent

B

Design and make a model of a system to automatically control the ventilation in a conservatory by opening and closing an air vent as the room temperature rises or falls.

Ordinary Level Folder

<i>Analysis of brief</i>	Design should incorporate the following features: Air vent, automatically open/close as temperature rises and falls.	5
<i>Investigation of possible solutions</i>	Evidence of investigation: (sketches, photos, etc.) Various types of air vents and opening/closing mechanisms/systems.	5
<i>Design Ideas</i>	Air vent : Sketch of one design shown.	6
<i>Criteria for selection of solution</i>	Valid justification of this idea (at least two reasons).	4
<i>Sketches /drawings for manufacture</i>	Manufacture drawing of the chosen solution and sub-system.	6
<i>Manufacturing sequence/processes</i>	Sequence of events for manufacture of the chosen solution.	5
<i>Testing and Evaluation</i>	Evidence of testing/modification during manufacture and/or evaluation against the brief/design specification and/or third party evaluation.	5
<i>Presentation of folder</i>	Layout: use of diagrams, sketches, photographs, neat and orderly.	4

Ordinary Level Product

<i>Product satisfies brief</i>	Is the product an air vent and is it complete?	5
<i>Suitability, Functional</i>	Does the air vent function? Does it open & close automatically?	5
<i>Design/Inventiveness</i>	Inventive design of air vent and/or model or mock-up of all or part of the solution?	5
<i>Originality, commercial comp.</i>	Creative use of materials/recycled parts/ electronic components/ mechanisms/colour/shape. Acceptable use of commercial components?	5
<i>Appropriateness of materials</i>	Materials selected suited to their respective functions?	5
<i>Appropriate sub-system(s)</i>	Appropriate electro-mechanical sub-system?	5
<i>App. manufacturing processes</i>	Complete air vent manufactured using appropriate processes?	5
<i>Quality of processes</i>	Quality of the product after manufacture?	5
<i>Assembly</i>	Appropriate methods of assembly used? Quality of assembly.	5
<i>Detailed finish/Safety Considerations</i>	No sharp edges or safety hazards (loose parts, toxic paints etc.?)	5
<i>Tech. competencies/ Application of skills</i>	Appropriate level and range of skills/technological competencies?	5
<i>Overall presentation</i>	Attractive, well presented product?	5

Conservatory Air Vent

B

Design and make a model of a system to automatically control the ventilation in a conservatory by opening and closing an air vent as the room temperature rises or falls.

Higher Level Folder

<i>Analysis of brief</i>	Problem posed by brief broken down into identifiable units? (Restate: mark = 1) A. Air vent, automatic opening & closing in response to temperature changes . (0-3) B. Design specification generated/list of objectives..... (0-2)	5
<i>Investigation of possible solutions</i>	Evidence of investigation/identification/research: (sketches, photos, etc.) A. Various types of air vents, (0-3) B. automatic control sub-system, (0-2)	5
<i>Design Ideas</i>	A. Air vent & sub-system design 1 - well sketched & annotated (0-3) B. Air vent & sub system design 2 - well sketched & annotated (0-3)	6
<i>Criteria for selection of solution</i>	A. Selected design identified. (0-2) B. Valid justification of selected design idea and sub-system..... (0-2)	4
<i>Sketches /drawings for manufacture</i>	Dimensioned/scaled drawings-sketches associated with manufacture. A. Detailed drawings of the chosen solution (0-3) B. Circuit drawings/Graphic of PIC circuit with inputs & outputs shown (0-3)	6
<i>Manufacturing sequence/processes</i>	A. Sequence of events for manufacture of the chosen solution. (0-2) B. Materials list with sizes and costing (0-3)	5
<i>Testing and Evaluation</i>	A. Evidence of testing/modification during manufacture and/or evaluation against the brief/design specification and/or third party evaluation (0-3) B. Possible improvements identified..... (0-2)	5
<i>Presentation of folder</i>	A. Layout: use of diagrams, sketches, photographs, neat and orderly..... (0-3) B. Correct sequence of presentation as outlined in form S.67 (Design Tasks) ... (0-1)	4

Higher Level Product

<i>Product satisfies brief</i>	A. Is the product an air vent and is it complete? (0-3) B. Does it have an automatic open/close sub-system? (0-2)	5
<i>Suitability, Functional</i>	A. Is the air vent suitable for use? (0-3) B. Does it open and close automatically in response to temperature changes?... (0-2)	5
<i>Design/Inventiveness</i>	A. Inventive design of the Air vent and sub-system and/or mock-up of all or part of the solution? (model = 2)..... (0-5)	5
<i>Originality, commercial comp.</i>	A. Creative use of materials/recycled parts/electronic components, mechanisms, colour, shape. Acceptable use of commercial components?..... (0-5)	5
<i>Appropriateness of materials</i>	A. Materials selected suited to their respective functions? (strong, robust, rigid, etc.) (0-5)	5
<i>Appropriate sub-system(s)</i>	A. Appropriate opening and closing mechanism? (0-3) B. Appropriate electronic controller? (0-2) (Not working max. mark 4)	5
<i>App. manufacturing processes</i>	A. Product manufactured using appropriate processes? (0-3) B. Control system manufactured using appropriate processes? (0-2)	5
<i>Quality of processes</i>	A. Quality of air vent after manufacture..... (0-3) B. Quality of the control system after manufacture?..... (0-2)	5
<i>Assembly</i>	A. Appropriate methods of assembly used? (0-3) B. Quality of assembly (0-2)	5
<i>Detailed finish/Safety Considerations</i>	A. No sharp edges or other safety hazards?..... (0-3) B. All parts well finished?..... (0-2)	5
<i>Tech. competencies/ Application of skills</i>	Does the product demonstrate that the candidate has an: A. Appropriate range & level of technological competencies? (vent)..... (0-3) B. Appropriate range & level of technological competencies? (sub-system)..... (0-2)	5
<i>Overall presentation</i>	A. Attractive well presented product? (0-4) B. Instructions for use (if needed), controls labelled?..... (0-1)	5

C

Height Adjustable Chair

Design and make a model of a chair/seat where the height of the seat can be adjusted electro-mechanically. The height should only be adjustable when the user is seated.

Ordinary Level Folder

<i>Analysis of brief</i>	Design should incorporate the following features: Electro-mechanically height adjustable chair. Operational only when seated.	5
<i>Investigation of possible solutions</i>	Evidence of investigation: (sketches, photos, etc.) Various types of Height Adjustable Chairs and control systems.	5
<i>Design Ideas</i>	Height Adjustable Chair: Sketch of one design shown.	6
<i>Criteria for selection of solution</i>	Valid justification of this idea (at least two reasons).	4
<i>Sketches /drawings for manufacture</i>	Manufacture drawing of the chosen solution and sub-system.	6
<i>Manufacturing sequence/processes</i>	Sequence of events for manufacture of the chosen solution.	5
<i>Testing and Evaluation</i>	Evidence of testing/modification during manufacture and/or evaluation against the brief/design specification and/or third party evaluation.	5
<i>Presentation of folder</i>	Layout: use of diagrams, sketches, photographs, neat and orderly.	4

Ordinary Level Product

<i>Product satisfies brief</i>	Is the product a working model of a height adjustable chair?	5
<i>Suitability, Functional</i>	Does the chair/seat have a suitable and functional height adjustable seat?	5
<i>Design/Inventiveness</i>	Inventive design of the Height Adjustable Chair and control system and/or model or mock-up of all or part of the solution?	5
<i>Originality, commercial comp.</i>	Creative use of materials/recycled parts/ electronic components/ mechanisms/colour/shape. Acceptable use of commercial components?	5
<i>Appropriateness of materials</i>	Materials selected suited to their respective functions?	5
<i>Appropriate sub-system(s)</i>	Appropriate height adjusting mechanism ?	5
<i>App. manufacturing processes</i>	Complete height adjustable chair and control system manufactured using appropriate processes?	5
<i>Quality of processes</i>	Quality of the product after manufacture?	5
<i>Assembly</i>	Appropriate methods of assembly used? Quality of assembly.	5
<i>Detailed finish/Safety Considerations</i>	No sharp edges or safety hazards (loose parts, toxic paints etc.?)	5
<i>Tech. competencies/ Application of skills</i>	Appropriate level and range of skills/technological competencies?	5
<i>Overall presentation</i>	Attractive, well presented product?	5

C

Height Adjustable Chair

Design and make a model of a chair/seat where the height of the seat can be adjusted electro-mechanically. The height should only be adjustable when the user is seated.

Higher Level Folder

<i>Analysis of brief</i>	Problem posed by brief broken down into identifiable units? (Restate: mark = 1) A. Height Adjustable Chair, electro-mechanically controlled, seated control..... (0-3) B. Design specification generated/list of objectives..... (0-2)	5
<i>Investigation of possible solutions</i>	Evidence of investigation/identification/research: (sketches, photos, etc.) A. Various types of height adjustable chairs, etc..... (0-3) B. Various mechanical/electro-mechanical solutions..... (0-2)	5
<i>Design Ideas</i>	A. Height Adjustable Chair design 1 - well sketched & annotated (0-3) B. Height Adjustable Chair design 2 - well sketched & annotated (0-3)	6
<i>Criteria for selection of solution</i>	A. Selected design identified..... (0-2) B. Valid justification of selected design idea and sub-system (0-2)	4
<i>Sketches /drawings for manufacture</i>	Dimensioned/scaled drawings-sketches associated with manufacture. A. Detailed drawings of the chosen solution (0-3) B. Circuit drawings/Graphic of PIC circuit with inputs & outputs shown (0-3)	6
<i>Manufacturing sequence/processes</i>	A. Sequence of events for manufacture of the chosen solution. (0-2) B. Materials list with sizes and costing (0-3)	5
<i>Testing and Evaluation</i>	A. Evidence of testing/modification during manufacture and/or evaluation against the brief/design specification and/or third party evaluation (0-3) B. Possible improvements identified..... (0-2)	5
<i>Presentation of folder</i>	A. Layout: use of diagrams, sketches, photographs, neat and orderly..... (0-3) B. Correct sequence of presentation as outlined in form S.67 (Design Tasks) ... (0-1)	4

Higher Level Product

<i>Product satisfies brief</i>	A. Is the product a height adjustable chair and is it complete? (0-3) B. Is there a height adjusting electro-mechanical system?..... (0-2)	5
<i>Suitability, Functional</i>	A. Does the chair/seat have a suitable and functional height adjustable seat? (0-3) B. Is there an over-ride so that the person must be seated to operate the chair? . (0-2)	5
<i>Design/Inventiveness</i>	A. Inventive design of the height adjustable chair and control system and/or mock-up of all or part of the solution? (model = 2)..... (0-5)	5
<i>Originality, commercial comp.</i>	A. Creative use of materials/recycled parts/electronic components, mechanisms, colour, shape. Acceptable use of commercial components?..... (0-5)	5
<i>Appropriateness of materials</i>	A. Materials selected suited to their respective functions? (strong, robust, rigid, weather proof, etc.) (0-5)	5
<i>Appropriate Sub-system</i>	A. Appropriate mechanical system?..... (0-3) B. Appropriate electrical/electronic control system? (0-2) (Not working max. mark 4)	5
<i>App. manufacturing processes</i>	A. Height adjustable chair manufactured using appropriate processes?..... (0-3) B. Control system manufactured using appropriate processes? (0-2)	5
<i>Quality of processes</i>	A. Quality of the height adjustable chair after manufacture using the stated processes? (0-3) B. Quality of the control system after manufacture?..... (0-2)	5
<i>Assembly</i>	A. Appropriate methods of assembly used? (0-3) B. Quality of assembly (0-2)	5
<i>Detailed finish/Safety Considerations</i>	A. No sharp edges or other safety hazards?..... (0-3) B. All parts well finished?..... (0-2)	5
<i>Tech. competencies/ Application of skillss</i>	Does the product demonstrate that the candidate has an: A. Appropriate range & level of technological competencies? (chair)..... (0-3) B. Appropriate range & level of technological competencies? (sub-system)..... (0-2)	5
<i>Overall presentation</i>	A. Attractive well presented product? (0-4) B. Instructions for use (if needed), controls labelled? (0-1)	5

D**Wind Vane**

Design and make a wind vane which has a remote electronic wind direction display. Note: Wireless remote display is not required.

Ordinary Level Folder

<i>Analysis of brief</i>	Design should incorporate the following features: Wind vane, remote display showing wind direction.	5
<i>Investigation of possible solutions</i>	Evidence of investigation: (sketches, photos, etc.) Various types of wind vanes, possible displays, wind directions.	5
<i>Design Ideas</i>	Wind vane: Sketch of one design shown.	6
<i>Criteria for selection of solution</i>	Valid justification of this idea (at least two reasons).	4
<i>Sketches /drawings for manufacture</i>	Manufacture drawing of the chosen solution and sub-system.	6
<i>Manufacturing sequence/processes</i>	Sequence of events for manufacture of the chosen solution.	5
<i>Testing and Evaluation</i>	Evidence of testing/modification during manufacture and/or evaluation against the brief/design specification and/or third party evaluation.	5
<i>Presentation of folder</i>	Layout: use of diagrams, sketches, photographs, neat and orderly.	4

Ordinary Level Product

<i>Product satisfies brief</i>	Is the product a Wind vane with a remote wind indication display?	5
<i>Suitability, Functional</i>	Does the Wind vane & remote display function as it should and is it suitable for use?	5
<i>Design/Inventiveness</i>	Inventive design of the wind vane and/or mock-up of all or part of the solution?	5
<i>Originality, commercial comp.</i>	Creative use of materials/recycled parts/ electronic components/ mechanisms/colour/shape. Acceptable use of commercial components?	5
<i>Appropriateness of materials</i>	Materials selected suited to their respective functions?	5
<i>Appropriate sub-system(s)</i>	Appropriate sub-systems?	5
<i>App. manufacturing processes</i>	Complete wind vane manufactured using appropriate processes?	5
<i>Quality of processes</i>	Quality of the product after manufacture?	5
<i>Assembly</i>	Appropriate methods of assembly used? Quality of assembly.	5
<i>Detailed finish/Safety Considerations</i>	No sharp edges or safety hazards (loose parts, toxic paints etc.?)	5
<i>Tech. competencies/ Application of skills</i>	Appropriate level and range of skills/technological competencies?	5
<i>Overall presentation</i>	Attractive, well presented product?	5

Wind Vane

D

Design and make a wind vane which has a remote electronic wind direction display. Note: Wireless remote display is not required.

Higher Level Folder

<i>Analysis of brief</i>	Problem posed by brief broken down into identifiable units?	5
	A. Wind vane with remote display showing wind direction..... (0-3) B. Design specification generated/list of objectives..... (0-2) (Restate brief: Total mark = 1)	
<i>Investigation of possible solutions</i>	Evidence of investigation/identification/research: (sketches, photos, etc.)	5
	A. Various types of wind vanes, (0-3) B. Possible position/proximity sensors and outputs for the display. (0-2)	
<i>Design Ideas</i>	A. Wind vane design 1 - well sketched & annotated..... (0-3) B. Wind vane design 2 - well sketched & annotated..... (0-3)	6
	A. Selected design identified..... (0-2) B. Valid justification of selected design idea and sub-system..... (0-2)	4
<i>Sketches /drawings for manufacture</i>	Dimensioned/scaled drawings-sketches associated with manufacture.	6
	A. Detailed drawings of the chosen solution (0-3) B. Circuit drawings/Graphic of PIC circuit with inputs & outputs shown (0-3)	
<i>Manufacturing sequence/processes</i>	A. Sequence of events for manufacture of the chosen solution..... (0-2) B. Materials list with sizes and costing (0-3)	5
	A. Evidence of testing/modification during manufacture and/or evaluation against the brief/design specification and/or third party evaluation (0-3) B. Possible improvements identified..... (0-2)	5
<i>Presentation of folder</i>	A. Layout: use of diagrams, sketches, photographs, neat and orderly..... (0-3) B. Correct sequence of presentation as outlined in form S.67 (Design Tasks) ... (0-1)	4

Higher Level Product

<i>Product satisfies brief</i>	A. Is the product a wind vane? (0-3) B. Does it incorporate a remote directional display? (0-2)	5
	A. Is the wind vane functional? (0-3) B. Does it have a functional remote electronic wind direction display? (0-2)	5
<i>Design/Inventiveness</i>	A. Inventive design of the wind vane and remote display and/or mock-up of all or part of the solution? (model = 2) (0-5)	5
<i>Originality, commercial comp.</i>	A. Creative use of materials/recycled parts/electronic components, mechanisms, colour, shape. Acceptable use of commercial components?..... (0-5)	5
<i>Appropriateness of materials</i>	A. Materials selected suited to their respective functions? (strong, robust, rigid, etc.) (0-5)	5
<i>Appropriate sub-system(s)</i>	A. Appropriate electro-mechanical sub-system (0-5) (Not working max. mark 4)	5
<i>App. manufacturing processes</i>	A. Wind vane manufactured using appropriate processes? (0-3) B. Sub-system & remote display manufactured using appropriate processes? ... (0-2)	5
	A. Quality of the wind vane after manufacture using the stated processes?..... (0-3) B. Quality of the remote display after manufacture? (0-2)	5
<i>Assembly</i>	A. Appropriate methods of assembly used? (0-3) B. Quality of assembly (0-2)	5
	A. No sharp edges or other safety hazards?..... (0-3) B. All parts well finished?..... (0-2)	5
<i>Tech. competencies/ Application of skillss</i>	Does the product demonstrate that the candidate has an:	5
	A. Appropriate range & level of technological competencies? (vane) (0-3) B. Appropriate range & level of technological competencies? (sub-system)..... (0-2)	
<i>Overall presentation</i>	A. Attractive well presented product? (0-4) B. Instructions for use (if needed), controls labelled?..... (0-1)	5

Monorail Transport System

E

Design and make a model of a monorail transport system to move people from one airport terminal to another. Limit switches or other appropriate safety features should be incorporated into the design.

Note: It is only necessary to display a small section of the rail.

Ordinary Level Folder

<i>Analysis of brief</i>	Design should incorporate the following features: Monorail system between two terminals with appropriate safety features.	5
<i>Investigation of possible solutions</i>	Evidence of investigation: (sketches, photos, etc.) Various types of monorail designs & mechanical sub-systems.	5
<i>Design Ideas</i>	Monorail system: Sketch of one design shown.	6
<i>Criteria for selection of solution</i>	Valid justification of this idea (at least two reasons).	4
<i>Sketches /drawings for manufacture</i>	Manufacture drawing of the chosen solution and sub-system.	6
<i>Manufacturing sequence/processes</i>	Sequence of events for manufacture of the chosen solution.	5
<i>Testing and Evaluation</i>	Evidence of testing/modification during manufacture and/or evaluation against the brief/design specification and/or third party evaluation.	5
<i>Presentation of folder</i>	Layout: use of diagrams, sketches, photographs, neat and orderly.	4

Ordinary Level Product

<i>Product satisfies brief</i>	Is the product an electro-mechanically controlled monorail transport system?	5
<i>Suitability, Functional</i>	Does the monorail system work? (allowing for complexity of the solution)	5
<i>Design/Inventiveness</i>	Inventive design of the monorail system and/or mock-up of all or part of the solution?	5
<i>Originality, commercial comp.</i>	Creative use of materials/recycled parts/ electronic components/ mechanisms/colour/shape. Acceptable use of commercial components?	5
<i>Appropriateness of materials</i>	Materials selected suited to their respective functions?	5
<i>Appropriate sub-system(s)</i>	Appropriate mechanical/electro-mechanical sub-system?	5
<i>App. manufacturing processes</i>	Complete Monorail system manufactured using appropriate processes?	5
<i>Quality of processes</i>	Quality of product after manufacture?	5
<i>Assembly</i>	Appropriate methods of assembly used? Quality of assembly.	5
<i>Detailed finish/Safety Considerations</i>	No sharp edges or safety hazards (loose parts, toxic paints etc.?)	5
<i>Tech. competencies/ Application of skills</i>	Appropriate level and range of skills/technological competencies?	5
<i>Overall presentation</i>	Attractive, well presented product?	5

E

Monorail Transport System

Design and make a model of a monorail transport system to move people from one airport terminal to another. Limit switches or other appropriate safety features should be incorporated into the design.

Note: It is only necessary to display a small section of the rail.

Higher Level Folder

<i>Analysis of brief</i>	Problem posed by brief broken down into identifiable units? (Restate: mark = 1) A. Monorail system between two terminals with appropriate safety features.....(0-3) B. Design specification generated/list of objectives(0-2)	5
<i>Investigation of possible solutions</i>	Evidence of investigation/identification/research: (sketches, photos, etc.) A. Monorail designs, mechanical/electro-mechanical sub-systems(0-3) B. Limit switching/other safety features(0-2)	5
<i>Design Ideas</i>	A. Monorail system- Design 1 - well sketched & annotated.....(0-3) B. Monorail system- Design 2 - well sketched & annotated.....(0-3)	6
<i>Criteria for selection of solution</i>	A. Selected design identified(0-2) B. Valid justification of selected design idea and sub-system(0-2)	4
<i>Sketches /drawings for manufacture</i>	Dimensioned/scaled drawings-sketches associated with manufacture. A. Detailed drawings of the chosen solution.....(0-3) B. Circuit drawings/Graphic of PIC circuit with inputs & outputs shown(0-3)	6
<i>Manufacturing sequence/processes</i>	A. Sequence of events for manufacture of the chosen solution(0-2) B. Materials list with sizes and costing.....(0-3)	5
<i>Testing and Evaluation</i>	A. Evidence of testing/modification during manufacture and/or evaluation against the brief/design specification and/or third party evaluation.....(0-3) B. Possible improvements identified(0-2)	5
<i>Presentation of folder</i>	A. Layout: use of diagrams, sketches, photographs, neat and orderly(0-3) B. Correct sequence of presentation as outlined in form S.67 (Design Tasks)....(0-1)	4

Higher Level Product

<i>Product satisfies brief</i>	A. Is the product a working model of a monorail transport system ?.....(0-3) B. Does it incorporate a mechanical/electro-mechanical sub-system?.....(0-2)	5
<i>Suitability, Functional</i>	A. Will this product function as a monorail transport system?(0-3) B. Does it have a functional sub-system with appropriate safety features?(0-2)	5
<i>Design/Inventiveness</i>	A. Inventive design of the Monorail system and/or mock-up of all or part of the solution (model = 2)(0-5)	5
<i>Creativity</i>	A. Creative use of materials/re-cycled parts/electronic components/mechanisms/colour/shape. Acceptable use of commercial components.....(0-5)	5
<i>Appropriateness of materials</i>	A. Suitability of the materials selected for the Monorail system and sub-system.....(0-5)	5
<i>Appropriate sub-system(s)</i>	A. Appropriate mechanical/electro-mechanical sub-system with safety feature. (0-5) (Not working max. mark 4)	5
<i>App. manufacturing processes</i>	A. Monorail system manufactured using appropriate processes(0-3) B. Control system manufactured using appropriate processes(0-2)	5
<i>Quality of processes</i>	A. Quality of the artefact after manufacture using stated processes?(0-3) B. Quality of the control system?(0-2)	5
<i>Assembly</i>	A. Appropriate methods of assembly used?(0-3) B. Quality of assembly(0-2)	5
<i>Detailed finish/Safety Considerations</i>	A. No sharp edges or other safety hazards?(0-3) B. All parts well finished?(0-2)	5
<i>Tech. competencies/ Application of skills</i>	Does the product demonstrate that the candidate has an: A. Appropriate range & level of technological competencies? (monorail)(0-3) B. Appropriate range & level of technological competencies? (sub-system).....(0-2)	5
<i>Overall presentation</i>	A. Attractive well presented product?(0-4) B. Instructions for use (if needed), controls labelled?(0-1)	5

F

Whirligig

Design and make a wind powered whirligig that depicts a novelty scene. The scene should illuminate automatically at night.

Ordinary Level Folder

<i>Analysis of brief</i>	Design should incorporate the following features: A wind powered whirligig, depicts a novelty scene and has an automatic lighting system.	5
<i>Investigation of possible solutions</i>	Evidence of investigation: (sketches, photos, etc.) Various types of whirligigs, possible mechanisms and circuitry.	5
<i>Design Ideas</i>	Whirligig: Sketch of one design shown.	6
<i>Criteria for selection of solution</i>	Valid justification of this idea (at least two reasons).	4
<i>Sketches /drawings for manufacture</i>	Manufacture drawing of the chosen solution and sub-system.	6
<i>Manufacturing sequence/processes</i>	Sequence of events for manufacture of the chosen solution.	5
<i>Testing and Evaluation</i>	Evidence of testing/modification during manufacture and/or evaluation against the brief/design specification and/or third party evaluation.	5
<i>Presentation of folder</i>	Layout: use of diagrams, sketches, photographs, neat and orderly.	4

Ordinary Level Product

<i>Product satisfies brief</i>	Is the product a whirligig with an automatic lighting system?	5
<i>Suitability, Functional</i>	Does the whirligig & lighting system work? If not, has it the potential to work?	5
<i>Design/Inventiveness</i>	Inventive design of the whirligig and/or mock-up of solution?	5
<i>Originality, commercial comp.</i>	Creative use of materials/recycled parts/ electronic components/ mechanisms/colour/shape. Acceptable use of commercial components?	5
<i>Appropriateness of materials</i>	Materials selected suited to their respective functions?	5
<i>Appropriate sub-system(s)</i>	Appropriate mechanical & lighting system, reliable?	5
<i>App. manufacturing processes</i>	Complete whirligig and electronic lighting system manufactured using appropriate processes?	5
<i>Quality of processes</i>	Quality of the product after manufacture?	5
<i>Assembly</i>	Appropriate methods of assembly used? Quality of assembly?	5
<i>Detailed finish/Safety Considerations</i>	No sharp edges or safety hazards (loose parts, toxic paints etc.?)	5
<i>Tech. competencies/ Application of skillss</i>	Appropriate level and range of skills/technological competencies?	5
<i>Overall presentation</i>	Attractive, well presented product?	5

F**Whirligig**

Design and make a wind powered whirligig that depicts a novelty scene. The scene should illuminate automatically at night.

Higher Level Folder

<i>Analysis of brief</i>	Problem posed by brief broken down into identifiable units? (Restate: mark = 1) A. Wind powered whirligig, novelty scene and automatic lighting system. (0-3) B. Design specification generated/list of objectives..... (0-2)	5
<i>Investigation of possible solutions</i>	Evidence of investigation/identification/research: (sketches, photos, etc.) A. Various types of whirligigs, mechanisms. (0-3) B. Novelty scenes and lighting systems (0-2)	5
<i>Design Ideas</i>	A. Whirligig design 1 - well sketched & annotated..... (0-3) B. Whirligig design 2 - well sketched & annotated..... (0-3)	6
<i>Criteria for selection of solution</i>	A. Selected design identified (0-2) B. Valid justification of selected design idea and sub-system..... (0-2)	4
<i>Sketches /drawings for manufacture</i>	Dimensioned/scaled drawings-sketches associated with manufacture. A. Detailed drawings of the chosen solution (0-3) B. Circuit drawings/Graphic of PIC circuit with inputs & outputs shown (0-3)	6
<i>Manufacturing sequence/processes</i>	A. Sequence of events for manufacture of the chosen solution (0-2) B. Materials list with sizes and costing (0-3)	5
<i>Testing and Evaluation</i>	A. Evidence of testing/modification during manufacture and/or evaluation against the brief/design specification and/or third party evaluation (0-3) B. Possible improvements identified..... (0-2)	5
<i>Presentation of folder</i>	A. Layout: use of diagrams, sketches, photographs, neat and orderly..... (0-3) B. Correct sequence of presentation as outlined in form S.67 (Design Tasks) ... (0-1)	4

Higher Level Product

<i>Product satisfies brief</i>	A. Is the product a whirligig depicting a novelty scene? (0-3) B. Does the whirligig have an automatic lighting system? (0-2)	5
<i>Suitability, Functional</i>	A. Does the whirligig have a functioning mechanical system? (0-3) B. Is the lighting system reliable? (0-2)	5
<i>Design/Inventiveness</i>	A. Inventive design of the whirligig, mechanical & lighting system and/or mock-up of all or part of the solution? (model = 2)..... (0-5)	5
<i>Creativity</i>	A. Creative use of materials/recycled parts/electronic components, mechanisms, colour, shape. Acceptable use of commercial components? (0-5)	5
<i>Appropriateness of materials</i>	A. Materials selected suited to their respective functions? (strong, robust, rigid, etc.) (0-5)	5
<i>Appropriate sub-system(s)</i>	A. Appropriate mechanical & electronic sub-system (0-5) (Not working max. mark 4)	5
<i>App. manufacturing processes</i>	A. Whirligig manufactured using appropriate processes? (0-3) B. Lighting system manufactured using appropriate processes?..... (0-2)	5
<i>Quality of processes</i>	A. Quality of the whirligig after manufacture? (0-3) B. Quality of the lighting sub-system? (0-2)	5
<i>Assembly</i>	A. Appropriate methods of assembly used? (0-3) B. Quality of assembly (0-2)	5
<i>Detailed finish/Safety Considerations</i>	A. No sharp edges or other safety hazards?..... (0-3) B. All parts well finished?..... (0-2)	5
<i>Tech. competencies/ Application of skills</i>	Does the product demonstrate that the candidate has an: A. Appropriate range & level of technological competencies? (whirligig)..... (0-3) B. Appropriate range & level of technological competencies? (sub-system)..... (0-2)	5
<i>Overall presentation</i>	A. Attractive well presented product? (0-4) B. Instructions for use (if needed), controls labelled? (0-1)	5