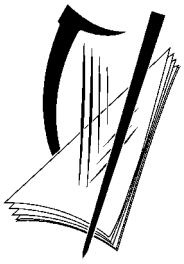

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate 2013

Marking Scheme

Technology Tasks

Ordinary & 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 2013

Technology Tasks

Ordinary & Higher Level

Marking Schemes & Prompt Sheets

A — Walking Aid

Design and make a working model of a walking aid for the elderly or infirm. The aid must include a compartment to hold items purchased while shopping. It must also have a suitable lighting system for use at night.

Ordinary Level Folder

Analysis of brief	Design should incorporate the following features: A walking aid with a compartment for shopping and a lighting system.	***5***
Investigation of possible solutions	Evidence of investigation: (sketches, photos, etc.) Various types of walking aid, types of lighting: bulbs, LEDs etc.	***5***
Design Ideas	Walking aid with a shopping compartment and a lighting system: Sketch of one design shown.	***6***
Criteria for selection of solution	Valid justification of this idea (at least two reasons).	***4***
Sketches /drawings for manufacture	Manufacture drawing of the chosen solution and sub-system.	***6***
Manufacturing sequence/processes	Sequence of events for manufacture of the chosen solution.	***5***
Testing and Evaluation	Evidence of testing/modification during manufacture and/or evaluation against the brief/design specification and/or third party evaluation.	***5***
Presentation of folder	Layout: use of diagrams, sketches, photographs, neat and orderly.	***4***

Ordinary Level Product

Product satisfies brief	Is the product a walking aid with a compartment and lighting system?	***5***
Suitability, Functional	Is the walking aid a functioning working model with a functional lighting system?	***5***
Design/Inventiveness	Inventive design of the Walking aid and lighting system?	***5***
Originality, commercial comp.	Creative use of materials/recycled parts/ electro-mechanical components/ mechanisms/colour/shape. Acceptable use of commercial components?	***5***
Appropriateness of materials	Materials selected suited to their respective functions?	***5***
Appropriate sub-system(s)	Appropriate compartment and lighting system?	***5***
App. manufacturing processes	Complete walking aid and lighting system manufactured using appropriate processes?	***5***
Quality of processes	Quality of the product after manufacture?	***5***
Assembly	Appropriate methods of assembly used? Quality of assembly.	***5***
Detailed finish/Safety Considerations	No sharp edges or safety hazards (loose parts, toxic paints etc.?)	***5***
Tech. competence/ Application of skills	Appropriate level of skill/technological competence?	***5***
Overall presentation	Attractive, well presented product?	***5***

A — Walking Aid

Design and make a working model of a walking aid for the elderly or infirm. The aid must include a compartment to hold items purchased while shopping. It must also have a suitable lighting system for use at night.

Higher Level Folder

Analysis of brief	Problem posed by brief broken down into identifiable units? **A.** Design should incorporate the following features: Walking aid with a shopping compartment and lighting system ..... **(0-3)** **B.** Design specification generated/list of objectives..... **(0-2)** (Restate brief: Total mark = 1)	***5***
Investigation of possible solutions	Evidence of investigation/identification/research: (sketches, photos, etc.) **A.** Various types of walking aid, etc. ..... **(0-3)** **B.** Lighting systems..... **(0-2)**	***5***
Design Ideas	**A.** Walking Aid Design 1 - well sketched & annotated..... **(0-3)** **B.** Walking Aid Design 2 - well sketched & annotated..... **(0-3)**	***6***
Criteria for selection of solution	**A.** Selected design identified..... **(0-2)** **B.** Valid justification of selected design idea and sub-system..... **(0-2)**	***4***
Sketches /drawings for manufacture	Dimensioned/scaled drawings-sketches associated with manufacture. **A.** Detailed drawings of the chosen solution ..... **(0-3)** **B.** Circuit drawings ..... **(0-3)**	***6***
Manufacturing sequence/processes	**A.** Sequence of events for manufacture of the chosen solution..... **(0-2)** **B.** Materials list with sizes and costing ..... **(0-3)**	***5***
Testing and Evaluation	**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***
Presentation of folder	**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

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

B — Novelty Cooling Fan

A company producing wind turbines wishes to provide its customers with a novelty cooling fan that represents their business. Design and make such a cooling fan to include suitable advertising. The fan must switch on and off automatically in response to the surrounding temperature.

Ordinary Level Folder

Analysis of brief	Design should incorporate the following features: Novelty cooling fan, advertising, switch on/off automatically.	***5***
Investigation of possible solutions	Evidence of investigation: (sketches, photos, etc.) Various types of novelty cooling fans, wind turbines, motors, propellers, logos.	***5***
Design Ideas	Novelty cooling fan with advertising: Sketch of one design shown.	***6***
Criteria for selection of solution	Valid justification of this idea (at least two reasons).	***4***
Sketches /drawings for manufacture	Manufacture drawing of the chosen solution and sub-system.	***6***
Manufacturing sequence/processes	Sequence of events for manufacture of the chosen solution.	***5***
Testing and Evaluation	Evidence of testing/modification during manufacture and/or evaluation against the brief/design specification and/or third party evaluation.	***5***
Presentation of folder	Layout: use of diagrams, sketches, photographs, neat and orderly.	***4***

Ordinary Level Product

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

B — Cooling Fan

A company producing wind turbines wishes to provide its customers with a novelty cooling fan that represents their business. Design and make such a cooling fan to include suitable advertising. The fan must switch on and off automatically in response to the surrounding temperature.

Higher Level Folder

Analysis of brief	Problem posed by brief broken down into identifiable units? (Restate: mark = 1) **A.** Novelty cooling fan, automatic control, suitable advertising ..... **(0-3)** **B.** Design specification generated/list of objectives..... **(0-2)**	***5***
Investigation of possible solutions	Evidence of investigation/identification/research: (sketches, photos, etc.) **A.** Various types of novelty cooling fans, ... **(0-3)** **B.** Electrical sub-system, motors, propellers, advertising, logos etc.. ..... **(0-2)**	***5***
Design Ideas	**A.** Novelty cooling fan design 1 - well sketched & annotated ..... **(0-3)** **B.** Novelty cooling fan design 2 - well sketched & annotated ..... **(0-3)**	***6***
Criteria for selection of solution	**A.** Selected design identified. ..... **(0-2)** **B.** Valid justification of selected design idea and sub-system..... **(0-2)**	***4***
Sketches /drawings for manufacture	Dimensioned/scaled drawings-sketches associated with manufacture. **A.** Detailed drawings of the chosen solution ..... **(0-3)** **B.** Circuit drawings ..... **(0-3)**	***6***
Manufacturing sequence/processes	**A.** Sequence of events for manufacture of the chosen solution. ..... **(0-2)** **B.** Materials list with sizes and costing ..... **(0-3)**	***5***
Testing and Evaluation	**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***
Presentation of folder	**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

Product satisfies brief	**A.** Is the product a novelty cooling fan and is it complete?..... **(0-3)** **B.** Does it have an automatic control circuit and advertising? ..... **(0-2)**	***5***
Suitability, Functional	**A.** Is the novelty cooling fan suitable for use? ..... **(0-3)** **B.** Does it have suitable advertising? ..... **(0-2)**	***5***
Design/Inventiveness	**A.** Inventive design of the Novelty cooling fan and/or mock-up of all or part of the solution? (model = 2)..... **(0-5)**	***5***
Originality, commercial comp.	**A.** Creative use of materials/recycled parts/electronic components, mechanisms, colour, shape. Acceptable use of commercial components?..... **(0-5)**	***5***
Appropriateness of materials	**A.** Materials selected suited to their respective functions? (strong, robust, rigid, etc.) ..... **(0-5)**	***5***
Appropriate sub-system(s)	**A.** Appropriate electrical subsystem?..... **(0-3)** **B.** Appropriate advertising display?..... **(0-2)** (Not working max. mark 4)	***5***
App. manufacturing processes	**A.** Product manufactured using appropriate processes? ..... **(0-3)** **B.** Control system manufactured using appropriate processes? ..... **(0-2)**	***5***
Quality of processes	**A.** Quality of novelty cooling fan after manufacture..... **(0-3)** **B.** Quality of the control system after manufacture?..... **(0-2)**	***5***
Assembly	**A.** Appropriate methods of assembly used? ..... **(0-3)** **B.** Quality of assembly..... **(0-2)**	***5***
Detailed finish/Safety Considerations	**A.** No sharp edges or other safety hazards?..... **(0-3)** **B.** All parts well finished?..... **(0-2)**	***5***
Tech. competence/ Application of skills	Does the product demonstrate that the candidate has a: **A.** High level of skill/technological competence? (novelty cooling fan) ..... **(0-3)** **B.** High level of skill/technological competence? (control system)..... **(0-2)**	***5***
Overall presentation	**A.** Attractive well presented product? ..... **(0-3)** **B.** Instructions for use (if needed), controls labelled?..... **(0-2)**	***5***

C Wild Bird Feeding Station

Design and make an all weather wild bird feeding station for use in the garden. Your design must include a suitable electronic system to indicate that a bird is feeding at the station.

Ordinary Level Folder

Analysis of brief	Design should incorporate the following features: Feeding station for wild birds, all weather, indicator to show birds are feeding.	***5***
Investigation of possible solutions	Evidence of investigation: (sketches, photos, etc.) Various types of wild bird feeding stations and indicator systems.	***5***
Design Ideas	Wild bird feeding station: Sketch of one design shown.	***6***
Criteria for selection of solution	Valid justification of this idea (at least two reasons).	***4***
Sketches /drawings for manufacture	Manufacture drawing of the chosen solution and sub-system.	***6***
Manufacturing sequence/processes	Sequence of events for manufacture of the chosen solution.	***5***
Testing and Evaluation	Evidence of testing/modification during manufacture and/or evaluation against the brief/design specification and/or third party evaluation.	***5***
Presentation of folder	Layout: use of diagrams, sketches, photographs, neat and orderly.	***4***

Ordinary Level Product

Product satisfies brief	Is the product a wild bird all weather feeding station with indicator system?	***5***
Suitability, Functional	Is the product suitable for feeding wild birds and does it have a functioning indicator system?	***5***
Design/Inventiveness	Inventive design of the feeding station and indicator system and/or model or mock -up of all or part of the solution?	***5***
Originality, commercial comp.	Creative use of materials/recycled parts/ electronic components/ mechanisms/colour/shape. Acceptable use of commercial components?	***5***
Appropriateness of materials	Materials selected suited to their respective functions?	***5***
Appropriate sub-system(s)	Appropriate indicator system?	***5***
App. manufacturing processes	Complete bird feeder and indicator system manufactured using appropriate processes?	***5***
Quality of processes	Quality of the product after manufacture?	***5***
Assembly	Appropriate methods of assembly used? Quality of assembly.	***5***
Detailed finish/Safety Considerations	No sharp edges or safety hazards (loose parts, toxic paints etc.?)	***5***
Tech. competence/ Application of skills	Appropriate level of skill/technological competence?	***5***
Overall presentation	Attractive, well presented product?	***5***

C Wild Bird Feeding Station

Design and make an all weather wild bird feeding station for use in the garden. Your design must include a suitable electronic system to indicate that a bird is feeding at the station.

Higher Level Folder

Analysis of brief	Problem posed by brief broken down into identifiable units? (Restate: mark = 1) **A.** Wild bird feeding station, all weather with feeding indicator system..... **(0-3)** **B.** Design specification generated/list of objectives..... **(0-2)**	***5***
Investigation of possible solutions	Evidence of investigation/identification/research: (sketches, photos, etc.) **A.** Various types of wild bird feeding stations, etc..... **(0-3)** **B.** Sensing systems, all weather materials..... **(0-2)**	***5***
Design Ideas	**A.** Feeding station & indicator system design 1 - well sketched & annotated .... **(0-3)** **B.** Feeding station & indicator system design 2 - well sketched & annotated .... **(0-3)**	***6***
Criteria for selection of solution	**A.** Selected design identified. ..... **(0-2)** **B.** Valid justification of selected design idea and sub-system ..... **(0-2)**	***4***
Sketches /drawings for manufacture	Dimensioned/scaled drawings-sketches associated with manufacture. **A.** Detailed drawings of the chosen solution..... **(0-3)** **B.** Circuit drawings ..... **(0-3)**	***6***
Manufacturing sequence/processes	**A.** Sequence of events for manufacture of the chosen solution. ..... **(0-2)** **B.** Materials list with sizes and costing..... **(0-3)**	***5***
Testing and Evaluation	**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***
Presentation of folder	**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

Product satisfies brief	**A.** Is the product a wild bird feeding station and is it complete?..... **(0-3)** **B.** Is there an indicator system to indicate when birds are feeding?..... **(0-2)**	***5***
Suitability, Functional	**A.** Will the bird feeder work and are exposed parts weather proof? ..... **(0-3)** **B.** Does the indicator system operate? ..... **(0-2)**	***5***
Design/Inventiveness	**A.** Inventive design of the bird feeder and indicator system and/or mock-up of all or part of the solution? (model = 2)..... **(0-5)**	***5***
Originality, commercial comp.	**A.** Creative use of materials/recycled parts/electronic components, mechanisms, colour, shape. Acceptable use of commercial components?..... **(0-5)**	***5***
Appropriateness of materials	**A.** Materials selected suited to their respective functions? (strong, robust, rigid, weather proof, etc.) ..... **(0-5)**	***5***
Appropriate Sub-system	**A.** Appropriate feeding sensing system? ..... **(0-3)** **B.** Appropriate indicator output system?..... **(0-2)** (Not working max. mark 4)	***5***
App. manufacturing processes	**A.** Bird feeder manufactured using appropriate processes? ..... **(0-3)** **B.** Indicator system manufactured using appropriate processes? ..... **(0-2)**	***5***
Quality of processes	**A.** Quality of the bird feeder after manufacture using the stated processes?..... **(0-3)** **B.** Quality of the indicator system after manufacture?..... **(0-2)**	***5***
Assembly	**A.** Appropriate methods of assembly used? ..... **(0-3)** **B.** Quality of assembly..... **(0-2)**	***5***
Detailed finish/Safety Considerations	**A.** No sharp edges or other safety hazards?..... **(0-3)** **B.** All parts well finished?..... **(0-2)**	***5***
Tech. competence/ Application of skills	Does the product demonstrate that the candidate has a: **A.** High level of skill/technological competence? (Bird feeder) ..... **(0-3)** **B.** High level of skill/technological competence? (indicator system) ..... **(0-2)**	***5***
Overall presentation	**A.** Attractive well presented product? ..... **(0-3)** **B.** Instructions for use (if needed), controls labelled?..... **(0-2)**	***5***

D — Basketball Hoop

A sports academy wishes to have height adjustable basketball hoops for their basketball arena. Design and make a working model of a basketball hoop where the height of the hoop can be adjusted electro-mechanically (limit/proximity switches should be incorporated as part of the control system).

Ordinary Level Folder

Analysis of brief	Design should incorporate the following features: Height adjustable basketball hoop, electro-mechanically controlled, limit switches.	***5***
Investigation of possible solutions	Evidence of investigation: (sketches, photos, etc.) Various types of height adjustable basketball hoops, mechanisms, circuitry.	***5***
Design Ideas	Electro-mechanically height adjustable basketball hoop: Sketch of one design shown.	***6***
Criteria for selection of solution	Valid justification of this idea (at least two reasons).	***4***
Sketches /drawings for manufacture	Manufacture drawing of the chosen solution and sub-system.	***6***
Manufacturing sequence/processes	Sequence of events for manufacture of the chosen solution.	***5***
Testing and Evaluation	Evidence of testing/modification during manufacture and/or evaluation against the brief/design specification and/or third party evaluation.	***5***
Presentation of folder	Layout: use of diagrams, sketches, photographs, neat and orderly.	***4***

Ordinary Level Product

Product satisfies brief	Is the product an electro-mechanically height adjustable basketball hoop?	***5***
Suitability, Functional	Does the basketball hoop function as it should and is it suitable for use?	***5***
Design/Inventiveness	Inventive design of the basketball hoop and/or mock-up of all or part of the solution?	***5***
Originality, commercial comp.	Creative use of materials/recycled parts/ electronic components/ mechanisms/colour/shape. Acceptable use of commercial components?	***5***
Appropriateness of materials	Materials selected suited to their respective functions?	***5***
Appropriate sub-system(s)	Appropriate electro-mechanical sub-system?	***5***
App. manufacturing processes	Complete height adjustable basketball hoop manufactured using appropriate processes?	***5***
Quality of processes	Quality of the product after manufacture?	***5***
Assembly	Appropriate methods of assembly used? Quality of assembly.	***5***
Detailed finish/Safety Considerations	No sharp edges or safety hazards (loose parts, toxic paints etc.?)	***5***
Tech. competence/ Application of skills	Appropriate level of skill/technological competence?	***5***
Overall presentation	Attractive, well presented product?	***5***

D — Basketball Hop

A sports academy wishes to have height adjustable basketball hoops for their basketball arena. Design and make a working model of a basketball hoop where the height of the hoop can be adjusted electro-mechanically (limit/proximity switches should be incorporated as part of the control system).

Higher Level Folder

Analysis of brief	Problem posed by brief broken down into identifiable units? **A.** Electro-mechanical height adjustable basket ball hoop with limit switches... **(0-3)** **B.** Design specification generated/list of objectives..... **(0-2)** (Restate brief: Total mark = 1)	***5***
Investigation of possible solutions	Evidence of investigation/identification/research: (sketches, photos, etc.) **A.** Various types of height adjustable basketball hoops, ... **(0-3)** **B.** Possible mechanisms and circuitry..... **(0-2)**	***5***
Design Ideas	**A.** Basketball hoop design 1 - well sketched & annotated ..... **(0-3)** **B.** Basketball hoop design 2 - well sketched & annotated ..... **(0-3)**	***6***
Criteria for selection of solution	**A.** Selected design identified..... **(0-2)** **B.** Valid justification of selected design idea and sub-system..... **(0-2)**	***4***
Sketches /drawings for manufacture	Dimensioned/scaled drawings-sketches associated with manufacture. **A.** Detailed drawings of the chosen solution..... **(0-3)** **B.** Circuit drawings ..... **(0-3)**	***6***
Manufacturing sequence/processes	**A.** Sequence of events for manufacture of the chosen solution..... **(0-2)** **B.** Materials list with sizes and costing ..... **(0-3)**	***5***
Testing and Evaluation	**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***
Presentation of folder	**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

Product satisfies brief	**A.** Is the product a height adjustable basketball hoop?..... **(0-3)** **B.** Does it incorporate limit switches?..... **(0-2)**	***5***
Suitability, Functional	**A.** Is the basketball hoop height adjustable? ..... **(0-3)** **B.** Does it have functional limit switch control? ..... **(0-2)**	***5***
Design/Inventiveness	**A.** Inventive design of the height adjustable basketball hoop and control system and/ or mock-up of all or part of the solution? (model = 2) ..... **(0-5)**	***5***
Originality, commercial comp.	**A.** Creative use of materials/recycled parts/electronic components, mechanisms, colour, shape. Acceptable use of commercial components?..... **(0-5)**	***5***
Appropriateness of materials	**A.** Materials selected suited to their respective functions? (strong, robust, rigid, etc.) ..... **(0-5)**	***5***
Appropriate sub-system(s)	**A.** Appropriate electro-mechanical sub-system ..... **(0-5)** (Not working max. mark 4)	***5***
App. manufacturing processes	**A.** Basketball hoop and structure manufactured using appropriate processes? ... **(0-3)** **B.** Control system manufactured using appropriate processes? ..... **(0-2)**	***5***
Quality of processes	**A.** Quality of height adjustable basketball hoop after manufacture using the stated processes?..... .**(0-3)** **B.** Quality of the control circuit after manufacture?..... **(0-2)**	***5***
Assembly	**A.** Appropriate methods of assembly used? ..... **(0-3)** **B.** Quality of assembly..... **(0-2)**	***5***
Detailed finish/Safety Considerations	**A.** No sharp edges or other safety hazards?..... **(0-3)** **B.** All parts well finished?..... **(0-2)**	***5***
Tech. competence/ Application of skills	Does the product demonstrate that the candidate has a: **A.** High level of skill/technological competence? (Basketball hoop)..... **(0-3)** **B.** High level of skill/technological competence? (Control circuit)..... **(0-2)**	***5***
Overall presentation	**A.** Attractive well presented product? ..... **(0-3)** **B.** Instructions for use (if needed), controls labelled?..... **(0-2)**	***5***

E Animated Window Display

Design and make a working model of an animated window display to advertise an upcoming rock festival or concert.

Ordinary Level Folder

Analysis of brief	Design should incorporate the following features: Animated window display to promote a rock festival/concert.	***5***
Investigation of possible solutions	Evidence of investigation: (sketches, photos, etc.) Various animated displays, mechanisms, control circuitry.	***5***
Design Ideas	Animated display : Sketch of one design shown.	***6***
Criteria for selection of solution	Valid justification of this idea (at least two reasons).	***4***
Sketches /drawings for manufacture	Manufacture drawing of the chosen solution and sub-system.	***6***
Manufacturing sequence/processes	Sequence of events for manufacture of the chosen solution.	***5***
Testing and Evaluation	Evidence of testing/modification during manufacture and/or evaluation against the brief/design specification and/or third party evaluation.	***5***
Presentation of folder	Layout: use of diagrams, sketches, photographs, neat and orderly.	***4***

Ordinary Level Product

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

E Animated Window Display

Design and make a working model of an animated window display to advertise an upcoming rock festival or concert.

Higher Level Folder

Analysis of brief	Problem posed by brief broken down into identifiable units? (Restate: mark = 1) **A.** Animated window display, advertise a rock festival/concert, working model **(0-3)** **B.** Design specification generated/list of objectives ..... **(0-2)**	***5***
Investigation of possible solutions	Evidence of investigation/identification/research: (sketches, photos, etc.) **A.** Animated displays ..... **(0-3)** **B.** Mechanical/electro-mechanical sub-system ..... **(0-2)**	***5***
Design Ideas	**A.** Animated window display - Design 1 - well sketched & annotated..... **(0-3)** **B.** Animated window display - Design 2 - well sketched & annotated..... **(0-3)**	***6***
Criteria for selection of solution	**A.** Selected design identified ..... **(0-2)** **B.** Valid justification of selected design idea and sub-system ..... **(0-2)**	***4***
Sketches /drawings for manufacture	Dimensioned/scaled drawings-sketches associated with manufacture. **A.** Detailed drawings of the chosen solution..... **(0-3)** **B.** Circuit drawings ..... **(0-3)**	***6***
Manufacturing sequence/processes	**A.** Sequence of events for manufacture of the chosen solution ..... **(0-2)** **B.** Materials list with sizes and costing..... **(0-3)**	***5***
Testing and Evaluation	**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***
Presentation of folder	**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

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

F

Temperature Controlled Canopy

Potted plants are often left outdoors during the spring months. Night time temperatures however, can drop below freezing point potentially damaging the plants. Design and make a suitably scaled electro-mechanical canopy that will cover the plants when the temperature drops and retract when the temperature rises.

Ordinary Level Folder

Analysis of brief	Design should incorporate the following features: A canopy, electro-mechanically controlled, covers the plants and retracts in response to the temperature.	***5***
Investigation of possible solutions	Evidence of investigation: (sketches, photos, etc.) Various types of canopies, possible mechanisms, circuitry.	***5***
Design Ideas	Canopy: Sketch of one design shown.	***6***
Criteria for selection of solution	Valid justification of this idea (at least two reasons).	***4***
Sketches /drawings for manufacture	Manufacture drawing of the chosen solution and sub-system.	***6***
Manufacturing sequence/processes	Sequence of events for manufacture of the chosen solution.	***5***
Testing and Evaluation	Evidence of testing/modification during manufacture and/or evaluation against the brief/design specification and/or third party evaluation.	***5***
Presentation of folder	Layout: use of diagrams, sketches, photographs, neat and orderly.	***4***

Ordinary Level Product

Product satisfies brief	Is the product a canopy that opens/closes in response to temperature changes?	***5***
Suitability, Functional	Does the canopy work? If not, has it the potential to work?	***5***
Design/Inventiveness	Inventive design of the canopy and/or mock-up of solution?	***5***
Originality, commercial comp.	Creative use of materials/recycled parts/ electronic components/ mechanisms/colour/shape. Acceptable use of commercial components?	***5***
Appropriateness of materials	Materials selected suited to their respective functions?	***5***
Appropriate sub-system(s)	Appropriate control system, reliable?	***5***
App. manufacturing processes	Complete canopy and electro-mechanical system manufactured using appropriate processes?	***5***
Quality of processes	Quality of the product after manufacture?	***5***
Assembly	Appropriate methods of assembly used? Quality of assembly?	***5***
Detailed finish/Safety Considerations	No sharp edges or safety hazards (loose parts, toxic paints etc.?)	***5***
Tech. competence/ Application of skills	Appropriate level of skill/technological competence?	***5***
Overall presentation	Attractive, well presented product?	***5***

F Temperature Controlled Canopy

Potted plants are often left outdoors during the spring months. Night time temperatures however, can drop below freezing point potentially damaging the plants. Design and make a suitably scaled electro-mechanical canopy that will cover the plants when the temperature drops and retract when the temperature rises.

Higher Level Folder

Analysis of brief	Problem posed by brief broken down into identifiable units? (Restate: mark = 1) **A.** Temperature controlled electro-mechanical canopy ..... **(0-3)** **B.** Design specification generated/list of objectives..... **(0-2)**	***5***
Investigation of possible solutions	Evidence of investigation/identification/research: (sketches, photos, etc.) **A.** Various types of canopies. ..... **(0-3)** **B.** Possible electro-mechanical sub-systems. ..... **(0-2)**	***5***
Design Ideas	**A.** Canopy design 1 - well sketched & annotated..... **(0-3)** **B.** Canopy design 2 - well sketched & annotated..... **(0-3)**	***6***
Criteria for selection of solution	**A.** Selected design identified..... **(0-2)** **B.** Valid justification of selected design idea and sub-system..... **(0-2)**	***4***
Sketches /drawings for manufacture	Dimensioned/scaled drawings-sketches associated with manufacture. **A.** Detailed drawings of the chosen solution ..... **(0-3)** **B.** Circuit drawings ..... **(0-3)**	***6***
Manufacturing sequence/processes	**A.** Sequence of events for manufacture of the chosen solution..... **(0-2)** **B.** Materials list with sizes and costing ..... **(0-3)**	***5***
Testing and Evaluation	**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***
Presentation of folder	**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

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