Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate Examinations, 2007

Technology Tasks

Higher Level and Ordinary Level

Prompt Sheets & Marking Scheme

A — Electronically Controlled Door Locking Mechanism

Design and make a full-size electronically controlled locking mechanism for a door.

Ordinary Level Folder

Analysis of brief	Design should incorporate the following features: Locking mechanism must be full size and electronically controlled.	***5***
Investigation of possible solutions	Evidence of investigation: (sketches, photos, etc.) Various types of locking mechanisms, etc., electronically controlled systems.	***5***
Design Ideas	Locking mechanism: Sketch of one design shown.	***6***
Criteria for selection of solution	Two reasons for selecting locking mechanism / electronically controlled system.	***4***
Sketches /drawings for manufacture	Manufacture drawing of locking mechanism and electronically controlled system.	***6***
Manufacturing sequence/processes	Sequence of events for manufacture of automatic locking mechanism.	***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 full-size electronically controlled locking mechanism for a door?	***5***
Suitability, Functional	Does the locking mechanism function?	***5***
Design/Inventiveness	Inventive design of the locking mechanism 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 electronically controlled system?	***5***
App. manufacturing processes	Locking mechanism manufactured using appropriate processes?	***5***
Quality of processes	Quality of locking mechanism after manufacture?	***5***
Assembly	Appropriate methods of assembly used? Quality of assembly. (*available resources considered*)	***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 Electronically Controlled Door Locking Mechanism

Design and make a full-size electronically controlled locking mechanism for a door.

Higher Level Folder

Analysis of brief	Problem posed by brief broken down into identifiable units? **A.** Design should incorporate the following features: Locking mechanism must be full size and electronically controlled.....**(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 locking mechanisms, etc. .....**(0-3)** **B.** Electronically controlled systems. .....**(0-2)**	***5***
Design Ideas	**A.** Model design 1 - well sketched & annotated .....**(0-3)** **B.** Model 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(s) .....**(0-2)**	***4***
Sketches /drawings for manufacture	Dimensioned/scaled drawings-sketches associated with manufacture. **A.** Detailed drawing of locking mechanism.....**(0-4)** **B.** Circuit drawing of sub-system .....**(0-2)**	***6***
Manufacturing sequence/processes	**A.** Sequence of events for manufacture of the locking mechanism .....**(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 full-size locking mechanism for a door? .....**(0-3)** **B.** Does it incorporate an electronically controlled system?.....**(0-2)**	***5***
Suitability, Functional	**A.** Does the locking mechanism function? .....**(0-3)** **B.** Does the locking mechanism open when triggered? .....**(0-2)**	***5***
Design/Inventiveness	**A.** Inventive design of locking mechanism 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 electronically controlled sub-system, reliable?.....**(0-5)** (Not working max. mark 4)	***5***
App. manufacturing processes	**A.** Locking mechanism manufactured using appropriate processes?.....**(0-3)** **B.** Control system manufactured using appropriate processes?.....**(0-2)**	***5***
Quality of processes	**A.** Quality of locking mechanism after manufacture using stated processes? .....**(0-3)** **B.** Quality of the control circuit after manufacture? .....**(0-2)**	***5***
Assembly	**A.** Appropriate methods of assembly used? (*available resources considered*) ...**(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? (model).....**(0-3)** **B.** High level of skill/technological competence? (sub-system).....**(0-2)**	***5***
Overall presentation	**A.** Attractive well presented locking mechanism?.....**(0-3)** **B.** Instructions for use (if needed), controls labelled? .....**(0-2)**	***5***

B — Rotating Display Stand for Photographs

A rotating display stand is required by a sports club to display a series of photographs in the local clubhouse. In order to view the photographs individually, the display is required to rotate and pause before moving to the next photograph. Design and manufacture such a display unit.

Ordinary Level Folder

Analysis of brief	Display stand for clubhouse. Displays photographs. Rotates and pauses before moving to next photograph.	***5***
Investigation of possible solutions	Evidence of investigation: (sketches, photos, etc.) Various types of display stands and control systems.	***5***
Design Ideas	Display stand: Sketch of one design shown.	***6***
Criteria for selection of solution	Two reasons for selecting design / sub-system.	***4***
Sketches /drawings for manufacture	Manufacture drawing of display stand.	***6***
Manufacturing sequence/processes	Sequence of events for manufacture of display stand.	***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 rotating display stand for photographs and is it complete?	***5***
Suitability, Functional	Does display stand function using the sub-system?	***5***
Design/Inventiveness	Inventive design of display stand 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 control system?	***5***
App. manufacturing processes	Display stand manufactured using appropriate processes?	***5***
Quality of processes	Quality of display stand after manufacture?	***5***
Assembly	Appropriate methods of assembly used? Quality of assembly. (*available resources considered*)	***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 — Rotating Display Stand for Photographs

A rotating display stand is required by a sports club to display a series of photographs in the local clubhouse. In order to view the photographs individually, the display is required to rotate and pause before moving to the next photograph. Design and manufacture such a display unit.

Higher Level Folder

Analysis of brief	Problem posed by brief broken down into identifiable units? (Restate: mark = 1) **A.** Display stand for clubhouse. Displays photographs. Rotates and pauses before moving to next photograph. ..... **(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 display stands, etc. ..... **(0-3)** **B.** Sub-system circuitry & mechanisms. ..... **(0-2)**	***5***
Design Ideas	**A.** Display stand design 1 - well sketched & annotated ..... **(0-3)** **B.** Display stand design 2 - well sketched & annotated ..... **(0-3)**	***6***
Criteria for selection of solution	**A.** Selected display stand design & sub-system identified. ..... **(0-2)** **B.** Valid justification of selected design idea(s) & sub-system ..... **(0-2)**	***4***
Sketches /drawings for manufacture	Dimensioned/scaled drawings-sketches associated with manufacture. **A.** Detailed drawing of display stand and sub-system ..... **(0-3)** **B.** Circuit drawing of control system ..... **(0-3)**	***6***
Manufacturing sequence/processes	**A.** Sequence of events for manufacture of the display stand. ..... **(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 rotating display stand for photographs and is it complete? .... **(0-3)** **B.** Is the display stand suitable for a use in a clubhouse? ..... **(0-2)**	***5***
Suitability, Functional	**A.** Does the display stand rotate? ..... **(0-3)** **B.** Does the sub-system device pause and re-start? ..... **(0-2)**	***5***
Design/Inventiveness	**A.** Inventive design of display stand, 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 sub-system, reliable? ..... **(0-3)** **B.** Appropriate mechanical system? ..... **(0-2)** (Not working max. mark 4)	***5***
App. manufacturing processes	**A.** Product manufactured using appropriate processes? ..... **(0-3)** **B.** Sub-system manufactured using appropriate processes? ..... **(0-2)**	***5***
Quality of processes	**A.** Quality of display stand after manufacture using the stated processes? ..... **(0-3)** **B.** Quality of the sub-system after manufacture? ..... **(0-2)**	***5***
Assembly	**A.** Appropriate methods of assembly used? (*available resources considered*) ... **(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? (display stand) ..... **(0-3)** **B.** High level of skill/technological competence? (sub-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 Working Model of an Automatic Flagstaff

Design and make a working model of a flagstaff.
The flag is automatically raised at dawn and is automatically lowered at dusk.

Ordinary Level Folder

Analysis of brief	Working model of a flagstaff that will automatically raise a flag at dawn and lower the flag at dusk.	***5***
Investigation of possible solutions	Evidence of investigation: (sketches, photos, etc.) Various types of flagstaff, mechanisms and control systems.	***5***
Design Ideas	Flagstaff mechanism: Sketch of one design shown.	***6***
Criteria for selection of solution	Two reasons for selecting flagstaff design / raising & lowering sub-system.	***4***
Sketches /drawings for manufacture	Manufacture drawing of flagstaff / raising & lowering sub-system.	***6***
Manufacturing sequence/processes	Sequence of events for manufacture of flagstaff mechanism.	***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 working model of a flagstaff that will automatically raise a flag at dawn and lower the flag at dusk.	***5***
Suitability, Functional	Does the model's raising & lowering system function?	***5***
Design/Inventiveness	Inventive design of the raising & lowering system 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 raising & lowering system?	***5***
App. manufacturing processes	Model manufactured using appropriate processes?	***5***
Quality of processes	Quality of model after manufacture?	***5***
Assembly	Appropriate methods of assembly used? Quality of assembly. (*available resources considered*)	***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 model?	***5***

C Working Model of an Automatic Flagstaff

Design and make a working model of a flagstaff.
The flag is automatically raised at dawn and is automatically lowered at dusk.

Higher Level Folder

Analysis of brief	Problem posed by brief broken down into identifiable units? **A.** Working model of a flagstaff that will automatically raise a flag at dawn and lower the flag at dusk. ..... **(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 flagstaff, mechanisms, etc. ..... **(0-3)** **B.** Raising & lowering control sub-systems. ..... **(0-2)**	***5***
Design Ideas	**A.** Model design 1 - well sketched & annotated ..... **(0-3)** **B.** Model 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(s) ..... **(0-2)**	***4***
Sketches /drawings for manufacture	Dimensioned/scaled drawings-sketches associated with manufacture. **A.** Detailed drawing of model and raising & lowering sub-system ..... **(0-4)** **B.** Circuit drawing of sub-system ..... **(0-2)**	***6***
Manufacturing sequence/processes	**A.** Sequence of events for manufacture of the model ..... **(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 working model of a flagstaff?..... **(0-3)** **B.** Does it incorporate an automatic control system?..... **(0-2)**	***5***
Suitability, Functional	**A.** Does the flagstaff automatically raise at dawn?..... **(0-3)** **B.** Does the flagstaff automatically lower at dusk? ..... **(0-2)**	***5***
Design/Inventiveness	**A.** Inventive design of raising & lowering sub-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 raising & lowering sub-system, reliable?..... **(0-5)** (Not working max. mark 4)	***5***
App. manufacturing processes	**A.** Model manufactured using appropriate processes?..... **(0-3)** **B.** Sub-system manufactured using appropriate processes? ..... **(0-2)**	***5***
Quality of processes	**A.** Quality of model after manufacture using the stated processes?..... **(0-3)** **B.** Quality of the sub-system after manufacture?..... **(0-2)**	***5***
Assembly	**A.** Appropriate methods of assembly used? (*available resources considered*) ... **(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? (model)..... **(0-3)** **B.** High level of skill/technological competence? (sub-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 — Decorative Jewellery Box with integrated feature

Design and make a decorative jewellery box. An electronic or electro-mechanical feature must be integrated into the box. This feature activates when the box is opened.

Ordinary Level Folder

Analysis of brief	Decorative jewellery box with integrated electronic or electro-mechanical feature.	***5***
Investigation of possible solutions	Evidence of investigation: (sketches, photos, etc.) Various types of jewellery boxes, model making, etc.	***5***
Design Ideas	Decorative jewellery box: Sketch of one design shown.	***6***
Criteria for selection of solution	Two reasons for selecting jewellery box design.	***4***
Sketches /drawings for manufacture	Manufacture drawing of jewellery box.	***6***
Manufacturing sequence/processes	Sequence of events for manufacture of jewellery box.	***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 decorative jewellery box with integrated electronic or electro-mechanical feature?	***5***
Suitability, Functional	Is the sub-system activated when opened?	***5***
Design/Inventiveness	Decorative design of jewellery box 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 integrated electronic or electro-mechanical feature?	***5***
App. manufacturing processes	Decorative jewellery box manufactured using appropriate processes?	***5***
Quality of processes	Quality of decorative jewellery box after manufacture?	***5***
Assembly	Appropriate methods of assembly used? Quality of assembly. (*available resources considered*)	***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	Decorative, well presented product?	***5***

D Decorative Jewellery Box with integrated feature

Design and make a decorative jewellery box. An electronic or electro-mechanical feature must be integrated into the box. This feature activates when the box is opened.

Higher Level Folder

Analysis of brief	Problem posed by brief broken down into identifiable units? **A.** Decorative jewellery box with integrated electronic/electro-mech. feature ....**(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 jewellery boxes, model making, etc. .....**(0-3)** **B.** Integrated system circuitry and/or mechanism.....**(0-2)**	***5***
Design Ideas	**A.** Decorative jewellery box design 1 - well sketched & annotated .....**(0-3)** **B.** Decorative jewellery box design 2 - well sketched & annotated .....**(0-3)**	***6***
Criteria for selection of solution	**A.** Selected decorative jewellery box and sub-system identified.....**(0-2)** **B.** Valid justification of selected design idea(s) .....**(0-2)**	***4***
Sketches /drawings for manufacture	Dimensioned/scaled drawings-sketches associated with manufacture. **A.** Detailed drawing of decorative jewellery box .....**(0-3)** **B.** Drawing of integrated sub-system .....**(0-3)**	***6***
Manufacturing sequence/processes	**A.** Sequence of events for manufacture of the decorative jewellery box.....**(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 jewellery box? .....**(0-3)** **B.** Does it contain an integrated electronic or electro-mechanical feature?.....**(0-2)**	***5***
Suitability, Functional	**A.** Is jewellery box decorative?.....**(0-3)** **B.** Is the integrated feature activated when the box is opened? .....**(0-2)**	***5***
Design/Inventiveness	**A.** Decorative design of jewellery box, sub-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 trigger system, reliable?.....**(0-3)** **B.** Appropriate electronic or electro-mechanical sub-system? .....**(0-2)** (Not working max. mark 4)	***5***
App. manufacturing processes	**A.** Decorative jewellery box manufactured using appropriate processes?.....**(0-3)** **B.** Integrated sub-system manufactured using appropriate processes? .....**(0-2)**	***5***
Quality of processes	**A.** Quality of jewellery box after manufacture using the stated processes?.....**(0-3)** **B.** Quality of the integrated sub-system after manufacture?.....**(0-2)**	***5***
Assembly	**A.** Appropriate methods of assembly used? (*available resources considered*) ...**(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? (Jewellery box).....**(0-3)** **B.** High level of skill/technological competence? (sub-system).....**(0-2)**	***5***
Overall presentation	**A.** Decorative well presented display?.....**(0-3)** **B.** Instructions for use (if needed), controls labelled? .....**(0-2)**	***5***

E Electronic Water Testing Device

Pollution is a major problem in our rivers and lakes. Design and make an electronic device that can be used to compare the transparency of different samples of water.

Ordinary Level Folder

Analysis of brief	Electronic device to indicate the transparency of different water samples.	***5***
Investigation of possible solutions	Evidence of investigation: (sketches, photos, etc.) Various types of electronic water transparency indication devices etc.	***5***
Design Ideas	Electronic water transparency indication device: Sketch of one design.	***6***
Criteria for selection of solution	Two reasons for selecting this electronic water transparency indication device.	***4***
Sketches /drawings for manufacture	Manufacture drawing of the electronic water transparency indication device.	***6***
Manufacturing sequence/processes	Sequence of events for manufacture of the electronic water transparency indication device.	***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 electronic device designed to compare the transparency of different samples of water? Is it complete?	***5***
Suitability, Functional	Can the electronic device be used to compare the transparency of different samples of water?	***5***
Design/Inventiveness	Inventive design of electronic device 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	Good materials selection for the electronic device?	***5***
Appropriate sub-system(s)	Electronic system well integrated and reliable.	***5***
App. manufacturing processes	Electronic system manufactured using appropriate processes?	***5***
Quality of processes	Quality of electronic system unit after manufacture?	***5***
Assembly	Appropriate methods of assembly used? Quality of assembly. (*available resources considered*)	***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 Electronic Water Testing Device

Pollution is a major problem in our rivers and lakes. Design and make an electronic device that can be used to compare the transparency of different samples of water.

Higher Level Folder

Analysis of brief	Problem posed by brief broken down into identifiable units? **A.** Electronic device to indicate the transparency of different water samples.. ...**(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.** Investigation of various types of electronic indication devices....**(0-5)**	***5***
Design Ideas	**A.** Electronic indication device - Design 1 - well sketched & annotated....**(0-3)** **B.** Electronic indication device - Design 2 - well sketched & annotated....**(0-3)**	***6***
Criteria for selection of solution	**A.** Selected electronic indication device, features identified ....**(0-2)** **B.** Valid justification of selected design idea(s) ....**(0-2)**	***4***
Sketches /drawings for manufacture	Dimensioned/scaled drawings-sketches associated with manufacture. **A.** Detailed drawing of selected electronic indication device. ....**(0-3)** **B.** Features/details sketched and annotated. ....**(0-3)**	***6***
Manufacturing sequence/processes	**A.** Sequence of events for manufacture of electronic indication device ....**(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 electronic device designed to compare the transparency of different samples of water?....**(0-3)** **B.** Is the device complete?....**(0-2)**	***5***
Suitability, Functional	**A.** Can the electronic device be used to compare the transparency of different samples of water?....**(0-3)** **B.** How suitable is the measuring/comparison system?....**(0-2)**	***5***
Design/Inventiveness	**A.** Inventive design of electronic device and/or mock-up of all or part of the solution (model = 2)....**(0-5)**	***5***
Originality, commercial comp.	**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.** Materials selection for electronic device: (strong, robust, suitable) ....**(0-5)**	***5***
Appropriate sub-system(s)	**A.** Electronic system well integrated and reliable?....**(0-5)** (Not working max. mark 4)	***5***
App. manufacturing processes	**A.** Product manufactured using appropriate processes ....**(0-3)** **B.** Sub-system manufactured using appropriate processes....**(0-2)**	***5***
Quality of processes	**A.** Quality of product after manufacture using stated processes ....**(0-3)** **B.** Quality of sub-system after manufacture using stated processes ....**(0-2)**	***5***
Assembly	**A.** Appropriate methods of assembly used? (*available resources considered*) ...**(0-3)** **B.** Quality of assembly ....**(0-2)**	***5***
Detailed finish/Safety Considerations	**A.** No sharp edges or other safety hazards? ....**(0-3)** **B.** Has an attractive durable finish been applied? All parts well finished?....**(0-2)**	***5***
Tech. competence/ Application of skills	**A.** High level of skill/ technological competence (Product). ....**(0-3)** **B.** High level of skill/ technological competence (Sub-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 — Computer controlled gripping & lifting device

Design and make a computer controlled device capable of gripping a small object and then lifting the object vertically to a height of 100mm. After approximately 5 seconds, the device must place the object back in its original position.

Ordinary Level Folder

Analysis of brief	Computer controlled device to lift an object up 100mm and then return it to its original position.	***5***
Investigation of possible solutions	Evidence of investigation: (sketches, photos, etc.) Various types of gripping/lifting devices, model making, etc.	***5***
Design Ideas	Gripping & lifting device: Sketch of one design shown.	***6***
Criteria for selection of solution	Two reasons for selecting gripping/lifting device & computer controlled system.	***4***
Sketches /drawings for manufacture	Manufacture drawing of gripping/lifting device.	***6***
Manufacturing sequence/processes	Sequence of events for manufacture of the gripping/lifting device.	***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 product a model of a computer controlled device used to lift an object up 100mm and then return it to its original position. Is it complete?	***5***
Suitability, Functional	Does the gripping/lifting device operate?	***5***
Design/Inventiveness	Inventive design of gripping/lifting device 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	Appropriate material selection for the gripping/lifting device?	***5***
Appropriate sub-system(s)	Appropriate control system, reliable?	***5***
App. manufacturing processes	Gripping/lifting device manufactured using appropriate processes?	***5***
Quality of processes	Quality of gripping/lifting device after manufacture?	***5***
Assembly	Appropriate methods of assembly used? Quality of assembly. (*available resources considered*)	***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 with clear instructions.	***5***

F — Computer controlled gripping & lifting device

Design and make a computer controlled device capable of gripping a small object and then lifting the object vertically to a height of 100mm. After approximately 5 seconds, the device must place the object back in its original position.

Folder

Analysis of brief	Problem posed by brief broken down into identifiable units? (Restate: Total = 1) **A.** Computer controlled device to lift an object up 100mm and then return it to its original position ..... **(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 gripping/lifting devices, model making, etc. ..... **(0-3)** **B.** Computer control systems, circuitry & mechanisms ..... **(0-2)**	***5***
Design Ideas	**A.** Gripping/lifting device design 1 - well sketched & annotated ..... **(0-3)** **B.** Gripping/lifting device design 2 - well sketched & annotated ..... **(0-3)**	***6***
Criteria for selection of solution	**A.** Selected gripping/lifting device and computer control system identified ..... **(0-2)** **B.** Valid justification of selected design idea(s) ..... **(0-2)**	***4***
Sketches /drawings for manufacture	Dimensioned/scaled drawings-sketches associated with manufacture. **A.** Detailed drawing of gripping/lifting device and interface system ..... **(0-3)** **B.** Circuit drawings, computer program ..... **(0-3)**	***6***
Manufacturing sequence/processes	**A.** Sequence of events for manufacture of the gripping/lifting device ..... **(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***

Product

Product satisfies brief	**A.** Is the product a computer controlled device used to lift an object up 100mm and then return it to its original position? ..... **(0-3)** **B.** Is the system computer controlled? ..... **(0-2)**	***5***
Suitability, Functional	**A.** Does the gripping/lifting device operate? ..... **(0-3)** **B.** Is the system stable? ..... **(0-2)**	***5***
Design/Inventiveness	**A.** Inventive design of the gripping/lifting device, 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 system, reliable? ..... **(0-3)** **B.** Appropriate computer control system? ..... **(0-2)** (Not working max. mark 4)	***5***
App. manufacturing processes	**A.** Gripping/lifting device manufactured using appropriate processes? ..... **(0-3)** **B.** Control system constructed using appropriate processes? ..... **(0-2)**	***5***
Quality of processes	**A.** Quality of product after manufacture using the stated processes? ..... **(0-3)** **B.** Quality of the electro-mechanical sub-system? ..... **(0-2)**	***5***
Assembly	**A.** Appropriate methods of assembly used? (*available resources considered*) ... **(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? (gripping/lifting device) ..... **(0-3)** **B.** High level of skill/technological competence? (control system) ..... **(0-2)**	***5***
Overall presentation	**A.** Attractive, well presented computer controlled gripping/lifting device. ..... **(0-3)** **B.** Clear instructions for use, controls labelled, software details? ..... **(0-2)**	***5***