



***Coimisiún na Scrúduithe Stáit***  
State Examinations Commission

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*Junior Certificate Examination 2010*

***Technology Tasks***  
***Ordinary & Higher Level***

***Marking Schemes & Prompt Sheets***

## Data Projector Screen

**A**

**Design and make a working model of an electro-mechanically controlled data projector screen. The screen should stop automatically at its top and bottom limits.**

### Ordinary Level Folder

<i>Analysis of brief</i>	Design should incorporate the following features: Data projector screen which can be raised and lowered using electro-mechanical controls. Automatic stopping.	5
<i>Investigation of possible solutions</i>	Evidence of investigation: (sketches, photos, etc.) Various types of projector screens, etc., electro-mechanically controlled systems.	5
<i>Design Ideas</i>	Motorised data projector screen with limit switching : 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 data projector screen and electro-mechanically controlled system.	6
<i>Manufacturing sequence/processes</i>	Sequence of events for manufacture of the completed data projector screen.	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 model of an electro-mechanically controlled data projector screen?	5
<i>Suitability, Functional</i>	Does the data projector screen function?	5
<i>Design/Inventiveness</i>	Inventive design of the data projector screen and/or mock-up of all or part of the solution?	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-mechanically controlled system?	5
<i>App. manufacturing processes</i>	Data projector screen manufactured using appropriate processes?	5
<i>Quality of processes</i>	Quality of data projector screen after manufacture?	5
<i>Assembly</i>	Appropriate methods of assembly used? Quality of assembly. (available resources considered)	5
<i>Detailed finish/Safety Considerations</i>	No sharp edges or safety hazards (loose parts, toxic paints etc.?)	5
<i>Tech. competence/ Application of skills</i>	Appropriate level of skill/technological competence?	5
<i>Overall presentation</i>	Attractive, well presented product?	5

**A****Data Projector Screen**

**Design and make a working model of an electro-mechanically controlled data projector screen. The screen should stop automatically at its top and bottom limits.**

**Higher Level Folder**

<i>Analysis of brief</i>	Problem posed by brief broken down into identifiable units? A. Design should incorporate the following features: Electro-mechanically controlled data projector screen with limit switching. ..(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 data projector screens, etc.....(0-3) B. Electro-mechanically controlled systems.....(0-2)	5
<i>Design Ideas</i>	A. Model design 1 - well sketched & annotated .....(0-3) B. Model 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(s) .....(0-2)	4
<i>Sketches /drawings for manufacture</i>	Dimensioned/scaled drawings-sketches associated with manufacture. A. Detailed drawing of projector screen and sub-system.....(0-3) B. Drawing of circuit.....(0-3)	6
<i>Manufacturing sequence/processes</i>	A. Sequence of events for manufacture of the projector screen.....(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 model of a data projector screen? .....(0-3) B. Does it incorporate a motorised control system with limit switching? .....(0-2)	5
<i>Suitability, Functional</i>	A. Does the data projector screen function? .....(0-3) B. Does the data projector screen stop automatically at its limits? .....(0-2)	5
<i>Design/Inventiveness</i>	A. Inventive design of data projector screen 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-mechanically controlled sub-system, reliable? .....(0-5) (Not working max. mark 4)	5
<i>App. manufacturing processes</i>	A. Data projector screen manufactured using appropriate processes? .....(0-3) B. Control system manufactured using appropriate processes?.....(0-2)	5
<i>Quality of processes</i>	A. Quality of data projector screen after manufacture using stated processes? ... (0-3) B. Quality of the control circuit after manufacture? .....(0-2)	5
<i>Assembly</i>	A. Appropriate methods of assembly used? ( <i>available resources considered</i> ) ... (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. competence/ Application of skills</i>	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
<i>Overall presentation</i>	A. Attractive well presented data projector screen?.....(0-3) B. Instructions for use (if needed), controls labelled? .....(0-2)	5

**B**

## Bedside Tidy

**Design and make a bedside tidy to incorporate a mobile phone holder and a clock. A small light which activates automatically in darkness allowing the tidy to be located easily is also required.**

### Ordinary Level Folder

<i>Analysis of brief</i>	Design should incorporate the following features: Bedside tidy incorporating a mobile phone holder, a clock and an automatic light.	5
<i>Investigation of possible solutions</i>	Evidence of investigation: (sketches, photos, etc.) Various types of bedside tidies or parts (mobile phone holders, clocks, lights).	5
<i>Design Ideas</i>	Display: 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 bedside tidy	6
<i>Manufacturing sequence/processes</i>	Sequence of events for manufacture of the completed bedside tidy	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 bedside tidy and is it complete?	5
<i>Suitability, Functional</i>	Does the bedside tidy function and does it incorporate a mobile phone holder, clock and automatic light.	5
<i>Design/Inventiveness</i>	Inventive design of bedside tidy 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 clock and lighting system?	5
<i>App. manufacturing processes</i>	Bedside tidy manufactured using appropriate processes?	5
<i>Quality of processes</i>	Quality of bedside tidy after manufacture?	5
<i>Assembly</i>	Appropriate methods of assembly used? Quality of assembly. (available resources considered)	5
<i>Detailed finish/Safety Considerations</i>	No sharp edges or safety hazards (loose parts, toxic paints etc.?)	5
<i>Tech. competence/ Application of skills</i>	Appropriate level of skill/technological competence?	5
<i>Overall presentation</i>	Attractive, well presented product?	5

# B

## Bedside Tidy

**Design and make a bedside tidy to incorporate a mobile phone holder and a clock. A small light which activates automatically in darkness allowing the tidy to be located easily is also required.**

### Higher Level Folder

<i>Analysis of brief</i>	Problem posed by brief broken down into identifiable units? (Restate: mark = 1) A. Bedside tidy incorporating a mobile phone holder, clock and automatic light(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 bedside tidies .....(0-3) B. Sub-systems to achieve animation .....(0-2)	5
<i>Design Ideas</i>	A. Bedside tidy design 1 - well sketched & annotated.....(0-3) B. Bedside tidy design 2 - well sketched & annotated.....(0-3)	6
<i>Criteria for selection of solution</i>	A. Selected bedside tidy design & sub-system identified .....(0-2) B. Valid justification of selected design idea(s) & sub-system .....(0-2)	4
<i>Sketches /drawings for manufacture</i>	Dimensioned/scaled drawings-sketches associated with manufacture. A. Detailed drawing of bedside tidy and sub-system.....(0-3) B. Detailed drawing of circuit .....(0-3)	6
<i>Manufacturing sequence/processes</i>	A. Sequence of events for manufacture of the bedside tidy. ....(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 bedside tidy and is it complete?.....(0-3) B. Is the scale of the product appropriate?.....(0-2)	5
<i>Suitability, Functional</i>	A. Is the bedside tidy suitable for use? .....(0-3) B. Does the automatic lighting system function? .....(0-2)	5
<i>Design/Inventiveness</i>	A. Inventive design of the bedside tidy 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 mobile phone holder, clock and lighting sub-systems?.....(0-3) B. Reliable lighting system? .....(0-2) (Not working max. mark 4)	5
<i>App. manufacturing processes</i>	A. Product manufactured using appropriate processes?.....(0-3) B. Lighting system manufactured using appropriate processes? .....(0-2)	5
<i>Quality of processes</i>	A. Quality of bedside tidy after manufacture using the stated processes? .....(0-3) B. Quality of the lighting system after manufacture? .....(0-2)	5
<i>Assembly</i>	A. Appropriate methods of assembly used? ( <i>available resources considered</i> ) ... (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. competence/ Application of skills</i>	Does the product demonstrate that the candidate has a: A. High level of skill/technological competence? (bedside tidy) .....(0-3) B. High level of skill/technological competence? (lighting system) .....(0-2)	5
<i>Overall presentation</i>	A. Attractive well presented product?.....(0-3) B. Instructions for use (if needed), controls labelled? .....(0-2)	5

# Vehicle Warning System

**C**

**Design and make a working model of a system that alerts the driver of a vehicle which is too high to pass under an oncoming bridge or tunnel. The warning system should be mounted on a gantry and be highly visible to the driver.**

## Ordinary Level Folder

<i>Analysis of brief</i>	Design should incorporate the following features: High vehicle sensing system and a separate warning system mounted on a gantry.	5
<i>Investigation of possible solutions</i>	Evidence of investigation: (sketches, photos, etc.) Various types of sensors, outputs and gantries.	5
<i>Design Ideas</i>	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 gantry and sub-system.	6
<i>Manufacturing sequence/processes</i>	Sequence of events for manufacture of the sensing, warning system and gantry.	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 warning system for high vehicles and is it complete?	5
<i>Suitability, Functional</i>	Does the sensing and warning system function?	5
<i>Design/Inventiveness</i>	Inventive design of the system and gantry 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 sensing and output system?	5
<i>App. manufacturing processes</i>	Gantry and warning system manufactured using appropriate processes?	5
<i>Quality of processes</i>	Quality of gantry and warning system after manufacture?	5
<i>Assembly</i>	Appropriate methods of assembly used? Quality of assembly. (available resources considered)	5
<i>Detailed finish/Safety Considerations</i>	No sharp edges or safety hazards (loose parts, toxic paints etc.?)	5
<i>Tech. competence/ Application of skills</i>	Appropriate level of skill/technological competence?	5
<i>Overall presentation</i>	Attractive, well presented product?	5



## Vehicle Warning System

**Design and make a working model of a system that alerts the driver of a vehicle which is too high to pass under an oncoming bridge or tunnel. The warning system should be mounted on a gantry and be highly visible to the driver.**

### Higher Level Folder

<i>Analysis of brief</i>	Problem posed by brief broken down into identifiable units? (Restate: mark = 1) A. High vehicle warning system with the output mounted on a gantry.....(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 gantries, etc.....(0-3) B. Warning systems (input and output).....(0-2)	5
<i>Design Ideas</i>	A. Warning system and gantry design 1 - well sketched & annotated.....(0-3) B. Warning system and gantry design 2 - well sketched & annotated.....(0-3)	6
<i>Criteria for selection of solution</i>	A. Selected warning system and gantry identified.....(0-2) B. Valid justification of selected gantry design idea & warning system.....(0-2)	4
<i>Sketches /drawings for manufacture</i>	Dimensioned/scaled drawings-sketches associated with manufacture. A. Detailed drawing of gantry and input/output system.....(0-3) B. Circuit drawing of control system.....(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 there a gantry and is it complete?.....(0-3) B. Is there a warning input and output system?.....(0-2)	5
<i>Suitability, Functional</i>	A. Is the gantry structurally sound?.....(0-3) B. Does the warning system operate?.....(0-2)	5
<i>Design/Inventiveness</i>	A. Inventive design of warning system and gantry 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</i>	A. Appropriate height sensor?.....(0-3) B. Appropriate output warning system (highly visible)?.....(0-2) (Not working max. mark 4)	5
<i>App. manufacturing processes</i>	A. Gantry manufactured using appropriate processes?.....(0-3) B. Warning system manufactured using appropriate processes?.....(0-2)	5
<i>Quality of processes</i>	A. Quality of the gantry after manufacture using the stated processes?.....(0-3) B. Quality of the warning system after manufacture?.....(0-2)	5
<i>Assembly</i>	A. Appropriate methods of assembly used? ( <i>available resources considered</i> ) ... (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. competence/ Application of skills</i>	Does the product demonstrate that the candidate has a: A. High level of skill/technological competence? (gantry).....(0-3) B. High level of skill/technological competence? (warning system).....(0-2)	5
<i>Overall presentation</i>	A. Attractive well presented product?.....(0-3) B. Instructions for use (if needed), controls labelled?.....(0-2)	5

## Nail Polish Drier

**D**

**A beauty therapist requires a portable device to dry a client's nails after applying a coat of nail polish. Design and make an electro-mechanical device which will dry the nails without smudging. The device must switch on automatically when a hand is placed in position and switch off when the hand is removed.**

### Ordinary Level Folder

<i>Analysis of brief</i>	Design should incorporate the following features: Nail drier that switches on automatically on placement of the hand/s.	5
<i>Investigation of possible solutions</i>	Evidence of investigation: (sketches, photos, etc.) Various types of nail driers and some reference to sub systems.	5
<i>Design Ideas</i>	Nail drier and control 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 nail drier and sub-system	6
<i>Manufacturing sequence/processes</i>	Sequence of events for manufacture of the completed automatic nail drier.	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 nail drier that switches on automatically and is it complete?	5
<i>Suitability, Functional</i>	Does the nail drier function as it should and is it suitable for use?	5
<i>Design/Inventiveness</i>	Inventive design of the nail drier 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 switching system?	5
<i>App. manufacturing processes</i>	Nail drier and sub-system manufactured using appropriate processes?	5
<i>Quality of processes</i>	Quality of nail drier after manufacture?	5
<i>Assembly</i>	Appropriate methods of assembly used? Quality of assembly. (available resources considered)	5
<i>Detailed finish/Safety Considerations</i>	No sharp edges or safety hazards (loose parts, toxic paints etc.?)	5
<i>Tech. competence/ Application of skills</i>	Appropriate level of skill/technological competence?	5
<i>Overall presentation</i>	Attractive, well presented nail drier?	5



## Nail Polish Drier

**D**

**A beauty therapist requires a portable device to dry a client's nails after applying a coat of nail polish. Design and make an electro-mechanical device which will dry the nails without smudging. The device must switch on automatically when a hand is placed in position and switch off when the hand is removed.**

### Higher Level Folder

<i>Analysis of brief</i>	Problem posed by brief broken down into identifiable units? A. Nail drier that will switch on/off automatically.....(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 nail driers, .....(0-3) B. Sub-system components and control.....(0-2)	5
<i>Design Ideas</i>	A. Nail drier design 1 - well sketched & annotated .....(0-3) B. Nail drier 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(s) .....(0-2)	4
<i>Sketches /drawings for manufacture</i>	Dimensioned/scaled drawings-sketches associated with manufacture. A. Detailed drawing of the nail drier and sub-system.....(0-3) B. Control circuit drawing .....(0-3)	6
<i>Manufacturing sequence/processes</i>	A. Sequence of events for manufacture of the complete nail drier .....(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 nail drier?.....(0-3) B. Does it incorporate an automatic switching system? .....(0-2)	5
<i>Suitability, Functional</i>	A. Has the nail drier the potential to dry nails?.....(0-3) B. Does it switch on/off automatically?.....(0-2)	5
<i>Design/Inventiveness</i>	A. Inventive design of the nail drier 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, etc.).....(0-5)	5
<i>Appropriate sub-system(s)</i>	A. Appropriate switching and drying sub-system, reliable? .....(0-5) (Not working max. mark 4)	5
<i>App. manufacturing processes</i>	A. Nail drier manufactured using appropriate processes?.....(0-3) B. Sub-system manufactured using appropriate processes? .....(0-2)	5
<i>Quality of processes</i>	A. Quality of nail drier after manufacture using the stated processes? .....(0-3) B. Quality of the sub-system after manufacture?.....(0-2)	5
<i>Assembly</i>	A. Appropriate methods of assembly used? ( <i>available resources considered</i> ) ... (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. competence/ Application of skills</i>	Does the product demonstrate that the candidate has a: A. High level of skill/technological competence? (nail drier) .....(0-3) B. High level of skill/technological competence? (sub-system).....(0-2)	5
<i>Overall presentation</i>	A. Attractive well presented product?.....(0-3) B. Instructions for use (if needed), controls labelled? .....(0-2)	5

**E**

## Water Level Gauge

**Design and make an electronic water level gauge for a tank to indicate at least two different levels. All electronics must be suitably housed and the design should include a means of attachment to the tank.**

### Ordinary Level Folder

<i>Analysis of brief</i>	Design should incorporate the following features: Electronic water level gauge that will detect at least two different levels of water.	5
<i>Investigation of possible solutions</i>	Investigation of different water level gauges and/or possible circuits/components.	5
<i>Design Ideas</i>	Water level gauge: 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 water level gauge and electronic sub-system.	6
<i>Manufacturing sequence/processes</i>	Sequence of events for manufacture of the completed water level gauge.	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 electronic water level gauge and is it complete?	5
<i>Suitability, Functional</i>	Does the water level gauge detect at least two different levels?	5
<i>Design/Inventiveness</i>	Inventive design of the water level gauge 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>	Appropriate materials selected for the gauge housing and sub-system ?	5
<i>Appropriate sub-system(s)</i>	Appropriate water level detection system, reliable and easily operated?	5
<i>App. manufacturing processes</i>	Complete gauge 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. (available resources considered)	5
<i>Detailed finish/Safety Considerations</i>	No sharp edges or safety hazards (loose parts, toxic paints etc.?)	5
<i>Tech. competence/ Application of skills</i>	Appropriate level of skill/technological competence?	5
<i>Overall presentation</i>	Attractive, well presented water level gauge.	5

**E**

## Water Level Gauge

**Design and make an electronic water level gauge for a tank to indicate at least two different levels. All electronics must be suitably housed and the design should include a means of attachment to the tank.**

### Higher Level Folder

<i>Analysis of brief</i>	Problem posed by brief broken down into identifiable units? (Restate: mark = 1) A. Electronic water level gauge to detect a minimum of two different levels. Also a method of attachment to the tank..... (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. Water level gauges ..... (0-3) B. Sub-system solutions/components..... (0-2)	5
<i>Design Ideas</i>	A. Water level gauge - Design 1 - well sketched & annotated ..... (0-3) B. Water level gauge - Design 2 - well sketched & annotated ..... (0-3)	6
<i>Criteria for selection of solution</i>	A. Selected water level gauge design identified ..... (0-2) B. Valid justification of selected design idea(s) ..... (0-2)	4
<i>Sketches /drawings for manufacture</i>	Dimensioned/scaled drawings-sketches associated with manufacture. A. Detailed drawing of the water level gauge and housing ..... (0-3) B. Drawing of sub-system and circuit ..... (0-3)	6
<i>Manufacturing sequence/processes</i>	A. Sequence of events for manufacture of the complete water level gauge ..... (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 product a water level gauge and is it complete?..... (0-5)	5
<i>Suitability, Functional</i>	A. Will this product function as a water level gauge? ..... (0-3) B. Does it reliably detect at least two different levels?..... (0-2)	5
<i>Design/Inventiveness</i>	A. Inventive design of the water level gauge housing and sub-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 gauge housing and sub-system ... (0-5)	5
<i>Appropriate sub-system(s)</i>	A. Appropriate water level sensing system..... (0-3) B. Appropriate means of attachment to the tank..... (0-2) (Not working max. mark 4)	5
<i>App. manufacturing processes</i>	A. Gauge housing and attachment manufactured using appropriate processes.... (0-3) B. Water level detection system manufactured using appropriate processes..... (0-2)	5
<i>Quality of processes</i>	A. Quality of the housing/attachment after manufacture using stated processes?(0-3) B. Quality of the water level detection sub-system?..... (0-2)	5
<i>Assembly</i>	A. Appropriate methods of assembly used? ( <i>available resources considered</i> ) ... (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. Has an attractive durable finish been applied? All parts well finished?..... (0-2)	5
<i>Tech. competence/ Application of skills</i>	Does the product demonstrate that the candidate has a: A. High level of skill/technological competence? (Housing/attachment)..... (0-3) B. High level of skill/technological competence? (water level sub-system) ..... (0-2)	5
<i>Overall presentation</i>	A. Attractive, well presented housing/attachment?..... (0-3) B. Neat and well presented water level detection system? ..... (0-2)	5

**F****Turnstile**

**Design and make a working model of a turnstile which outputs the number of people that have passed through it. The counter must be capable of being reset. (Note: the counting may be either decimal or binary)**

**Ordinary Level Folder**

<i>Analysis of brief</i>	Design should incorporate the following features: A turnstile that incorporates a counter to count the number of people passing through it.	5
<i>Investigation of possible solutions</i>	Evidence of investigation: (sketches, photos, etc.) Various types of turnstiles and counters.	5
<i>Design Ideas</i>	Complete turnstile: 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 complete turnstile.	6
<i>Manufacturing sequence/processes</i>	Sequence of events for manufacture of the complete turnstile.	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 product a turnstile incorporating a counting a counting system.	5
<i>Suitability, Functional</i>	Does the turnstile automatically count the number of people passing through it?	5
<i>Design/Inventiveness</i>	Inventive design of a turnstile 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>	Appropriate material selection for the turnstile and sub-system?	5
<i>Appropriate sub-system(s)</i>	Appropriate control system, reliable?	5
<i>App. manufacturing processes</i>	Complete turnstile and counting system manufactured using appropriate processes?	5
<i>Quality of processes</i>	Quality of the completed turnstile with integral counter after manufacture?	5
<i>Assembly</i>	Appropriate methods of assembly used? Quality of assembly. (available resources considered)	5
<i>Detailed finish/Safety Considerations</i>	No sharp edges or safety hazards (loose parts, toxic paints etc.?)	5
<i>Tech. competence/ Application of skills</i>	Appropriate level of skill/technological competence?	5
<i>Overall presentation</i>	Attractive, well presented product with clear instructions.	5

**F****Turnstile**

**Design and make a working model of a turnstile which outputs the number of people that have passed through it. The counter must be capable of being reset.  
(Note: the counting may be either decimal or binary)**

**Higher Level Folder**

<i>Analysis of brief</i>	Problem posed by brief broken down into identifiable units? (Restate: mark = 1) A. Turnstile with integral counter and reset facility.....(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 turnstiles.....(0-3) B. Counter systems, components & mechanisms .....(0-2)	5
<i>Design Ideas</i>	A. Complete turnstile design 1 - well sketched & annotated .....(0-3) B. Complete turnstile design 2 - well sketched & annotated .....(0-3)	6
<i>Criteria for selection of solution</i>	A. Selected turnstile and counter system identified .....(0-2) B. Valid justification of selected design idea(s) .....(0-2)	4
<i>Sketches /drawings for manufacture</i>	Dimensioned/scaled drawings-sketches associated with manufacture. A. Detailed drawing of turnstile and interface/control system.....(0-3) B. Circuit drawings and/or computer controlprogram .....(0-3)	6
<i>Manufacturing sequence/processes</i>	A. Sequence of events for manufacture of the complete turnstile.....(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 turnstile? .....(0-3) B. Does the turnstile have an integral counting and reset facility? .....(0-2)	5
<i>Suitability, Functional</i>	A. Does the turnstile rotate in one direction only?.....(0-3) B. Is the counting system reliable? .....(0-2)	5
<i>Design/Inventiveness</i>	A. Inventive design of the turnstile, control 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 sensing and mechanical sub-system? .....(0-3) B. Appropriate output system displaying the number of people passing thru' ....(0-2) (Not working max. mark 4)	5
<i>App. manufacturing processes</i>	A. Turnstile manufactured using appropriate processes?.....(0-3) B. Control system/interface constructed using appropriate processes? .....(0-2)	5
<i>Quality of processes</i>	A. Quality of the turnstile after manufacture using the stated processes?.....(0-3) B. Quality of the counting and mechanical sub-system? .....(0-2)	5
<i>Assembly</i>	A. Appropriate methods of assembly used? ( <i>available resources considered</i> ) ... (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. competence/ Application of skills</i>	Does the product demonstrate that the candidate has a: A. High level of skill/technological competence? (turnstile).....(0-3) B. High level of skill/technological competence? (control system).....(0-2)	5
<i>Overall presentation</i>	A. Attractive, well presented turnstile.....(0-3) B. Clear instructions for use, controls labelled, software details? .....(0-2)	5