AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA | DEPARTMENT OF EDUCATION AND SCIENCE

Scrúdú an Teastais Shóisearaigh, 2001

Teicneolaíocht - Tascanna Dearaidh

Scéim Marcála

Ardleibhéal agus Gnáthleibhéal

Junior Certificate Examination, 2001

Technology - Design Tasks

Marking Scheme

Higher Level and Ordinary Level

A

Design and make a desk tidy suitable for a second level student. The desk tidy should incorporate a variable timer that will sound an alarm when a certain period of time has elapsed. Commercially available timers are not permitted.

Analysis of brief	Problem posed by brief broken down into identifiable units? A. A desk tidy incorporating a timer with alarm Electronic circuit is automatically activated after set time B. Design specification generated/list of objectives (Restate brief Total mark = 1)	(0-3) (0-2)	5
Investigation of possible solutions	Evidence of investigation/identification/research (sketches photos, etc) A. Desk Tidy shape, size to hold various items etc B. Variable timer, output devices, circuit housings etc	(0-3) (0-2)	5
Design Ideas	A. Desk Tidy Design 1 - well sketched & annotated B Desk Tidy Design 2 - well sketched & annotated	(0-3) (0-3)	6
Criteria for selection of solution	A. Selected Desk Tidy and Alarm circuit identified B Valid justification of selected design idea(s)	(0-2) (0-2)	4
Sketches /drawings for manufacture	Dimensioned/scaled drawings-sketches associated with manufacture A. Detailed drawing of Desk Tidy B. Circuit drawing of Timer circuit	(0-3) (0-3)	6
Manufacturing sequence/processes	A. Sequence of events for manufacture of the Desk Tidy/Timer B Materials/Components list with sizes and costing (1+1+1)	(0-2) (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 B Possible improvements identified	(0-3) (0-2)	5
Presentation of folder	A. Layout use of diagrams, sketches, photographs, neat and orderly B Correct sequence of presentation as outlined in form S 67 (Design Tasks)	(0-3) (0-1)	4

Product satisfies brief	A. Is the product a Desk Tidy is it complete? B. Does it incorporate a variable timer/alarm circuit? (No adjust –1)	(0-3) (0-2)	5
Suitability, Functional	A Is the product suitable for use as a Desk Tidy? B. Does the alarm function after a given time period?	(0-3) (0-2)	5
Design/Inventiveness	A. Inventive design of Desk Tidy/Timer 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 selection for the Desk Tidy & circuit housing (Strong, durable)	(0-5)	5
Appropriate sub-system(s)	A Appropriate timing system B. Appropriate alarm output (max 12V DC) (Not working max mark 4)	(0-3) (0-2)	5
App. manufacturing processes	A Desk Tidy manufactured using appropriate processes B. Circuit manufactured using appropriate processes	(0-3) (0-2)	5
Quality of processes	A. Quality of Desk Tidy after manufacture? B Quality of timer circuit after manufacture?	(0-3) (0-2)	5
Assembly	A. Appropriate methods of assembly used? (*available resources considered*) B Quality of assembly	(0-3) (0-2)	5
Detailed finish/Safety Considerations	A No sharp edges or safety hazards (loose parts toxic paints etc ?) B. Has an attractive durable finish been applied? All parts well finished?	(0-3) (0-2)	5
Tech. competence/ Application of skills	Does the product demonstrate that the candidate has a A High level of skill/technological competence? (Desk Tidy) B. High level of skill/technological competence? (Timer system)	(0-3) (0-2)	5
Overall presentation	A Attractive, well presented Desk Tidy and Timer system B. Switches labelled/instructions for use	(0-3) (0-2)	5

B

Design and make a working model of an electro-mechanically controlled bridge. The bridge should open and close to allow boats pass through and should have a maximum span of 300mm.

Analysis of brief	Problem posed by brief broken down into identifiable units? A. Electro/Mech controlled bridge to open & close to allow boats to pass Max span 300mm (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. Bridges barriers structures, model making, etc (0-3) B. Electro-mechanical control systems circuitry & mechanisms (0-2)		5
Design Ideas	A. Bridge Design 1 - well sketched & annotated (0-3) B Bridge Design 2 - well sketched & annotated (0-3)		6
Criteria for selection of solution	A Selected bridge and Electro/Mech 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 bridge and mechanical system (0-3) B Circuit drawing of electro control system (0-3)		6
Manufacturing sequence/processes	A. Sequence of events for manufacture of the bridge (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 satisfies brief	A Is the product a working model of a bridge and is it complete? (0-2) B Does model incorporate a mechanical system? (0-2) C Does model incorporate a control system? (0-1)		5
Suitability, Functional	A. Does the bridge open and close using the controls? (0-3) B Is the maximum span 300mm? (0-2)		5
Design/Inventiveness	A. Inventive design of the bridge, 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 control system reliable? (0-3) B. Appropriate mechanical system with open/close movement? (0-2) (Not working max mark 4)		5
App. manufacturing processes	A. Working model manufactured using appropriate processes? (0-3) B. Control system manufactured using appropriate processes? (0-2)		5
Quality of processes	A. Quality of working model 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? (*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? (working model) (0-3) B High level of skill/technological competence? (control system) (0-2)		5
Overall presentation	A. Attractive well presented working model and electro/mech system? (0-3) B. Instructions for use (if needed), controls labelled? (0-2)		5

C

Design and make a post box with a separate remote display to indicate that letters have been delivered.

Analysis of brief	Problem posed by brief broken down into identifiable units? A Postbox incorporating remote display facility Remote display required to indicate when letters has been delivered (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. Postboxes type shape size (0-3) B Mechanical or electronic device(s)/remote display (0-2)		5
Design Ideas	A Postbox Design 1 - well sketched & annotated (0-3) B. Postbox Design 2 - well sketched & annotated (0-3)		6
Criteria for selection of solution	A. Selected Postbox, trigger device,remote display 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 postbox (0-3) B. Drawing of trigger system/remote display (0-3)		6
Manufacturing sequence/processes	A. Sequence of events for manufacture of postbox and remote display (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 satisfies brief	A Is the product a postbox and is it complete? (0-2) B. Does it incorporate a trigger device? (0-2) C. Does it have a remote display? (0-1)	5
Suitability, Functional	A. Will this product function as a postbox? (0-3) B Does the trigger device operate the remote display? (0-2)	5
Design/Inventiveness	A Inventive design of postbox/trigger device with remote 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. Materials selection for postbox and remote display (strong robust, resistant to elements out of doors) (0-5)	5
Appropriate sub-system(s)	A. Appropriate trigger device, reliable and easily activated (0-3) B. Appropriate remote display offering clear reliable indication (0-2) (Not working max mark 4)	5
App. manufacturing processes	A. Postbox and display manufactured using appropriate processes (0-3) B Circuit manufactured using appropriate processes (0-2)	5
Quality of processes	A. Quality of postbox after manufacture using stated processes? (0-3) B. Quality of trigger device with remote display 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. Has an attractive durable finish been applied? 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? (postbox/display) (0-3) B high level of skill/technological competence? (trigger device) (0-2)	5
Overall presentation	A. Attractive, well presented postbox? (0-3) B Attractive well presented remote display? (0-2)	5

D

Design and make a moving figure suitable for display in a sports shop window. The figure must incorporate repetitive motion.

Analysis of brief	Problem posed by brief broken down into identifiable units? A. Moving figure display for a sports shop window with repetitive motion B. Design specification generated/list of objectives (Restate brief Total mark = 1)	 (0-3) (0-2)	5
Investigation of possible solutions	Evidence of investigation/identification/research (sketches photos, etc) A. Moving figure display for sports shop window B Repetitive movement mechanisms/devices	 (0-3) (0-2)	5
Design Ideas	A Moving Figure Display Design 1 - well sketched & annotated B. Moving Figure Display Design 2 - well sketched & annotated	(0-3) (0-3)	6
Criteria for selection of solution	A. Selected figure, repetitive mechanisms/device identified B Valid justification of selected design idea(s)	(0-2) (0-2)	4
Sketches /drawings for manufacture	Dimensioned/scaled drawings-sketches associated with manufacture A Detailed drawing of moving figure display B. Drawing of repetitive motion circuit/mechanism	 (0-3) (0-3)	6
Manufacturing sequence/processes	A. Sequence of events for manufacture of moving figure display B Materials list with sizes and costing	(0-2) (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 B Possible improvements identified	(0-3) (0-2)	5
Presentation of folder	A Layout use of diagrams, sketches photographs, neat and orderly B. Correct sequence of presentation as outlined in form 5 67 (Design Tasks)	(0-3) (0-1)	4

Product satisfies brief	A. Is the product a moving figure window display and is it complete? B. Does the moving figure incorporate repetitive motion?	(0-3) (0-2)	5
Suitability, Functional	A. Is the product suitable for display in a sports shop window? B. Does the repetitive motion function?	(0-3) (0-2)	5
Design/Inventiveness	A. Inventive design of moving figure 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/mechanisms/electronic components/colour/shape Acceptable use of commercial components	(0-5)	5
Appropriateness of materials	A. Materials selection for display/moving figure (strong, robust, rigid)	(0-5)	5
Appropriate sub-system(s)	A. To what extent does the sub-system provide repetitive motion B Is this device reliable and appropriate (Not working max mark 4)	(0-3) (0-2)	5
App. manufacturing processes	A. Figure display manufactured using appropriate processes B Repetitive motion device manufactured using appropriate processes	(0-3) (0-2)	5
Quality of processes	A Quality of display after manufacture using stated processes? B. Quality of repetitive device after manufacture?	(0-2) (0-3)	5
Assembly	A. Appropriate methods of assembly used? (*available resources considered*) B. Quality of assembly	(0-3) (0-2)	5
Detailed finish/Safety Considerations	A No sharp edges or other safety hazards (loose parts etc ?) B. Has an attractive finish been applied? All parts well finished?	(0-3) (0-2)	5
Tech. competence/ Application of skills	Does the product demonstrate that the candidate has a A. high level of skill/technological competence? (figure display) B. high level of skill/technological competence? (repetitive device)	 (0-2) (0-3)	5
Overall presentation	A. Attractive, well presented figure display B. Switches labelled/instructions for use	(0-3) (0-2)	5

E

Design and make a working model of an electro-mechanically controlled window cleaners' hoist suitable for high rise applications.

Analysis of brief	Problem posed by brief broken down into identifiable units? A Model of electro/mech controlled hoist suitable for high rise applications B. Design specification generated/list of objectives (Restate brief Total mark = 1)	(0-3) (0-2)	5
Investigation of possible solutions	Evidence of investigation/identification/research (sketches, photos, etc) A Hoists structures, model making, etc B. Electro-mechanical control systems circuitry & mechanisms	(0-3) (0-2)	5
Design Ideas	A. Hoist Design 1 - well sketched & annotated B. Hoist Design 2 - well sketched & annotated	(0-3) (0-3)	6
Criteria for selection of solution	A. Selected hoist and electro/mech control system identified B Valid justification of selected design idea(s)	(0-2) (0-2)	4
Sketches /drawings for manufacture	Dimensioned/scaled drawings-sketches associated with manufacture A Detailed drawing of hoist and mechanical system B. Circuit drawing of electro control system	(0-3) (0-3)	6
Manufacturing sequence/processes	A. Sequence of events for manufacture of the hoist B. Materials list with sizes and costing	(0-2) (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 B Possible improvements identified	(0-3) (0-2)	5
Presentation of folder	A Layout use of diagrams, sketches photographs neat and orderly B. Correct sequence of presentation as outlined in form S 67 (Design Tasks)	(0-3) (0-1)	4

Product satisfies brief	A. Is the product a working model of a hoist and is it complete? B. Does model incorporate a mechanical system? C. Does model incorporate a control system?	(0-2) (0-2) (0-1)	5
Suitability, Functional	A. Does the hoist move up and down using the controls? B. Is it suitable for high rise applications?	(0-3) (0-2)	5
Design/Inventiveness	A. Inventive design of the hoist, 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 control system reliable? B. Appropriate mechanical system with up/down movement? (Not working max mark 4)	(0-3) (0-2)	5
App. manufacturing processes	A. Working model manufactured using appropriate processes? B. Control system manufactured using appropriate processes?	(0-3) (0-2)	5
Quality of processes	A. Quality of working model after manufacture using the stated processes? B Quality of the control circuit after manufacture?	(0-3) (0-2)	5
Assembly	A. Appropriate methods of assembly used? (*available resources considered*) B Quality of assembly	(0-3) (0-2)	5
Detailed finish/Safety Considerations	A. No sharp edges or other safety hazards? B All parts well finished?	(0-3) (0-2)	5
Tech. competence/ Application of skills	Does the product demonstrate that the candidate has a A High level of skill/technological competence? (working model) B High level of skill/technological competence? (control system)	(0-3) (0-2)	5
Overall presentation	A Attractive well presented working model and electro/mech system? B. Instructions for use (if needed), controls labelled?	(0-3) (0-2)	5

F

A security alarm is required that will be activated by opening either the front door or a window of a house. Design and make a suitable working model of the alarm system incorporating both the door and window. Commercially available housings and circuits are not permitted.

Analysis of brief	Problem posed by brief broken down into identifiable units? A Model of alarm system with window and door Alarm activated by opening the door or window (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. Alarms components, door/window structure, model making etc (0-3) B Alarm systems (possible circuitry) (0-2)		5
Design Ideas	A. Model Design 1 (with door & window) - well sketched & annotated (0-3) B. Model Design 2 (with door & window) - well sketched & annotated (0-3)		6
Criteria for selection of solution	A. Selected model and alarm 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 model with door and window (0-3) B. Circuit drawing of electrical/electronic (or alt) system (0-3)		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

Product satisfies brief	A Is product a working model of an alarm system & is it complete? (0-3) B. Does model incorporate a window and door? (0-2)		5
Suitability, Functional	A. Does the alarm function ? Door trigger (2), window (1) (0-3) B Does the alarm output sound? (0-2)		5
Design/Inventiveness	A Inventive design of model/alarm 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 alarm activation system? (0-3) B. Appropriate alarm output system? (0-2) (Not working max mark 4)		5
App. manufacturing processes	A. Working model manufactured using appropriate processes? (0-3) B Alarm system manufactured using appropriate processes? (0-2)		5
Quality of processes	A. Quality of working model 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? *(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? (working model) (0-3) B. High level of skill/technological competence? (alarm system) (0-2)		5
Overall presentation	A Attractive well presented working model and alarm system? (0-5)		5

G

Design and make a computer controlled working model of a pedestrian crossing with traffic signalling. A push button must be provided as an Input for the pedestrian. Sound signalling must also be Incorporated for the visually impaired.

Analysis of brief	Problem posed by brief broken down into identifiable units? A. Design and make a working model of a pedestrian crossing The signalling (sound & light) activated by a button must be computer 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. Pedestrian crossing structure, electrical electronic components (0-3) B. Method(s) of computer interfacing (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 pedestrian crossing 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 pedestrian crossing (0-3) B. Drawing of control unit/electronic system interface (0-3)		6
Manufacturing sequence/processes	A Sequence of events for manufacture of pedestrian crossing (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 satisfies brief	A. Is the product a model of a pedestrian crossing and is it complete? (0-3) B Does the computer control program work? (0-2)	5
Suitability, Functional	A Product suitable model of pedestrian crossing? (0-3) B. How well do the lights/sound work? (0-2)	5
Design/Inventiveness	A. Inventive pedestrian crossing/use of control and software (control program) Mock up of all or part of the chosen 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. Materials selection for pedestrian crossing strong robust, appropriate sections used (0-5)	5
Appropriate sub-system(s)	A. Pedestrian crossing lights/sound appropriate? (0-3) B. Interface & control program appropriate? (0-2)	5
App. manufacturing processes	A. Pedestrian crossing manufactured using appropriate processes (0-3) B Electronic circuits (if any) and connection to the interface using appropriate techniques (0-2)	5
Quality of processes	A. Quality of pedestrian crossing after manufacture using stated processes? (0-3) B Quality of circuitry (if any) and wiring to the interface? (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? (pedestrian crossing) (0-3) B High level of technological competence? (control program) (0-2)	5
Overall presentation	A. Attractive well presented pedestrian crossing with neat wiring (0-5)	5