2013 Product Design

Intermediate 2

Finalised Marking Instructions

Part One: General Marking Principles for Product Design Intermediate 2

This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this Paper. These principles must be read in conjunction with the specific Marking Instructions for each question.

(a) Marks for each candidate response must always be assigned in line with these general marking principles and the specific Marking Instructions for the relevant question. If a specific candidate response does not seem to be covered by either the principles or detailed Marking Instructions, and you are uncertain how to assess it, you must seek guidance from your Team Leader/Principal Assessor.

(b) Marking should always be positive ie, marks should be awarded for what is correct and not deducted for errors or omissions.

GENERAL MARKING ADVICE: Product Design Intermediate 2

The marking schemes are written to assist in determining the "minimal acceptable answer" rather than listing every possible correct and incorrect answer. The following notes are offered to support Markers in making judgements on candidates' evidence, and apply to marking both end of unit assessments and course assessments.

Part Two: Marking Instructions for each Question

Within each question, marks are not awarded for repetition. This excludes question 1, where repetition is allowed within the question, but is not allowed within parts (a), (b) and (c).

SECTION A

Q1		Marks
a i	**Suitable sheet metal** • Stainless steel • Copper • Brass • Tin plate • Aluminium • etc. **Reasons given could be derived from any of the usual design issues** • Functional reasons • Ergonomic reasons • Environmental reasons • Durability reasons • Safety reasons • Cost/economic reasons • Aesthetics reasons • Material reasons • Manufacturing/production reasons **Two other possible routes of reasoning within this answer. Consumer and manufacturer suitability.** Good strength to weight ratio / Light in weight Reflects heat / conducts heat (NOT conducts electricity) Strong in every direction/not easy to bend **(for consumer)** Strong/hardwearing/robust/tough/sturdy Easily formed (jigs/formers/etc.)/easy to bend **(for manufacturer)** Inexpensive/cheap Ease of construction/connecting/jointing/assembly Easy to coat Doesn't rust Readily available Durable/lasts a long time (duration) etc. Each row above exemplifies answers that are of a similar nature. Only one response from each row will attract 1 mark **Only first response should be marked for each part of the question.** 1 mark for correct material and 1 mark for correct reason up to total of 2 marks.	**2**

Q1		Marks
a ii	**Suitable material and reason** **Material** • Acrylonitrile Butadiene Styrene/ABS • Polycarbonate • Polystyrene/High Impact Polystyrene/HIPS • Polypropylene • etc. • Urea Formaldehyde/Melamine Formaldehyde • Both thermoplastic and thermosetting plastic score zero **Reasons given could be derived from any of the usual design issues** • Functional reasons • Ergonomic reasons • Environmental reasons • Durability reasons • Safety reasons • Cost/economic reasons • Aesthetics reasons • Material reasons • Manufacturing/production reasons **Two other possible routes of reasoning within this answer.** **Consumer and manufacturer suitability.** Light in weight Good strength to weight ratio Strong in every direction/not easy to bend **(for consumer)** Strong/hardwearing/robust/tough/sturdy Easily formed Inexpensive/cheap Ease of construction/connecting/jointing/assembly Inbuilt colour Readily available Durable/lasts a long time (duration) etc. Each row above exemplifies answers that are of a similar nature. Only one response from each row will attract 1 mark. **Only first response should be marked for each part of the question.** 1 mark for correct material and 1 mark for correct reason up to total of 2 marks.	**2**

Q1			Marks
a	iii	**Suitable process and reason (control dial):** **Process** • Compression moulding • Injection moulding • 'Moulding' scores zero **Reason** • Cheap/inexpensive • Mass produced product • Due to the material • All the other plastic processes are not suitable • Intricate detail • Speed of production • Any other suitable justification **Only first response should be marked for each part of the question.** 1 mark for correct process and 1 mark for correct reason up to total of 2 marks. Reason and process have to match.	**2**
	iv	**Two reasons for producing models** **Design process stages** • Idea generation • Develop / improve / alter proposal • Prototyping • Evaluation • etc. **Visual** • Checking size • Checking proportion in 3D • Various aesthetic reasons **Ergonomic** • Checking fit of fingers in loading lever slot • Checking grip of control dial • etc. **Presentation** • To show to the client / other designers / target market • etc. Candidates may state general design issues such as aesthetics and ergonomics or they may state two specific reasons from each category. 1 mark per correct response up to a total of 2 marks.	**2**

Q1			Marks
b	i	**"Anthropometrics"** e.g. The loading lever has been designed to suit adult thumb width (answer showing link between toaster part and human dimension). • Loading lever – thumb width • Control dial – thumb and fingertip thickness • Overall width – hand span Any suitable answer relating human dimensions **and** relevant aspect of the toaster should be awarded 1 mark. 1 mark per correct response (including both elements of information) up to total of 2 marks. Vague answers which display an appropriate level of knowledge attract one mark. Two marks should be awarded where candidates have given an extended answer, which links one part of the toaster to three or more bits of anthropometric data. e.g. The width of the loading lever has been designed to suit the 95th percentile adult thumb width so that almost all potential users can push the lever down (Percentile/user/body/dimension/toaster part).	**2**
	ii	**"Physiology"** e.g. The toaster has been designed to be lifted easily by an adult. • Complete toaster – lifting • Loading lever – pressing • Control dial – turning/twisting Any suitable answer relating to human limitations which **links** to all/part of the toaster. The use of physical action **verbs** linking to the use of the toaster are to be looked for here. 1 mark per correct response (including both elements of information) up to total of 2 marks. Vague answers which display an appropriate level of knowledge attract one mark. Two marks should be awarded where candidates have given an extended answer, which links one part of the toaster to three, or more **justified** physiological activities. e.g. The toaster has been designed to be loaded easily, adjusted for toast colour and moved across the worktop easily using a small amount of effort and physical strength.	**2**

Q1		Marks
b iii	**"Psychology"** e.g. The different colour of the control dial makes it easy for the user to identify this important component. • Plastic body – looks like it will be cool to touch and therefore safe. • Plastic body – looks like it will be hot to touch and therefore hazardous. • Plastic control dial and buttons – contrasting colour for ease of identification. • Inner shell – shiny metal looks hygienic. **NB. We are not marking aesthetic qualities of the toaster in this question. Purely visual reasons are aesthetics.** **e.g. 'It is pink so people will want to buy it' Scores zero.** Any suitable answer relating to human thoughts/feelings/emotions, linking to a part, bit or the entire toaster. 1 mark per correct response (including both elements of information) up to total of 2 marks. Vague answers which display an appropriate level of knowledge attract one mark. e.g. It looks like it has good grip. (This is vague because we do not know which part of the toaster the candidate is referring to) 1 mark. Two marks should be awarded where candidates have given an expanded answer, which links one part of the toaster to three, or more **justified** psychological feelings.	**2**

Q1			Marks
c	i	**'Environment'** Candidates could choose to take two different environmental routes when answering this question. The global environment of the world in which we live or the local environment of the kitchen in which the toaster will most likely be sited. Global - recyclable materials / energy consumption / energy efficiency / etc. Local - rust / moisture / colour scheme / styling / etc. Any suitable environmental answer, linking to all/part/aspect of the toaster. Vague answers which display an appropriate level of knowledge attract 1 mark. Two marks should be awarded where candidates have given an expanded answer, which links one part of the toaster to three or more environmental considerations (not the other way round). 1 mark per correct response up to total of 2 marks.	**2**
	ii	**"safety"** • Complete toaster – securely assembled • Complete toaster – smooth surfaces / edges – no cuts • Complete toaster – electrical safety • Complete toaster – finger traps • Complete toaster – passed BSI / CE testing • Toaster base – non slip • Surface finishes – non toxic • Sheet metal inner shell – hygienic materials • etc. Any suitable safety related justification, which links to all/part/aspect of the toaster. Vague answers which display an appropriate level of knowledge attract 1 mark. Two marks should be awarded where candidates have given an expanded answer, which links one part of the toaster to three or more safety considerations (not the other way round). 1 mark per correct response (including both elements of information) up to total of 2 marks.	**2**

Q1		Marks
iii	**"ease of maintenance"** • Crumb tray – emptying / cleaning • Plastic body – cleaning • Components – replacement / repair • Complete toaster – dismantling / reassembly Any suitable ease of maintenance related justification which links to all/part/aspect of the toaster. Vague answers which display an appropriate level of knowledge attract 1 mark. Two marks should be awarded where candidates have given an expanded answer, which links one part/aspect of the toaster to three or more ease of maintenance considerations (not the other way round). 1 mark per correct response (including both elements of information) up to total of 2 marks.	**2**
		20

	Note: The marking scheme for question 1 (b) and (c) is as follows **One part + one justification = one mark** **One part + two justifications = one mark** **One part + three justifications = two marks** **Two separate parts + two separate justifications = two marks** **Vague or incomplete/extended responses may attract one mark**	

Section B

Q2		Marks
	A different technique must be used for each aspect. **A different display method must be used for each technique.** **Evaluation technique and display of results method must match evaluation activity.** • Candidates should be awarded one mark for naming an appropriate evaluation technique. • Candidates should be awarded one mark for a brief description of the evaluation activity. • Candidates should be awarded one mark for stating an appropriate 'display of results' method. **To gain three marks, all three aspects of the response must match each other.** *Where candidates have not named the evaluation technique but have given a detailed description of the activity, this may attract 2 marks.* *A generic description of an evaluation technique may attract 1 mark.*	
a i	Ease of use – candidates may refer to user trials / user trip / Internet research / etc. / (use it / 'ironing a shirt' etc. scores zero). **Description of evaluation activity marked on a 2-1-0 scale.** **Description of display or results marked on a 1-0 scale.**	**3**
ii	Time to reach ironing temperature – candidates may refer to testing / test rigs / comparison to other products / internet research / stopwatches / etc. / ('time it' scores zero) **Description of evaluation activity marked on a 2-1-0 scale.** **Description of display of results marked on a 1-0 scale.**	**3**
	Extended response gains three marks on the 3-2-1-0 scale. Candidate responses can be marked holistically e.g. A high quality sketch of how the results are displayed may contribute towards the description of the evaluation activity. This style of response could gain three marks if it appropriately addressed all three parts of the question.	

Q2			Marks
b	**i**	e.g. to show it is safe / it is 'safe' / to show it has been tested / conforms to British standards / meets British safety standards / it is 'approved' / etc. 1 mark per correct response up to total of 1 mark.	**1**
	ii	Material (polypropylene) / recyclable / has been recycled / it is a plastic / its group of plastic (5) / in group 5 / type of plastic. 1 mark per correct response up to total of 2 marks.	**2**
			9

Q3			Marks
a	**i**	split line / parison cut marks / hollow / flash / thinning / open at one end / radiused corners / etc.	**1**
	ii	tapered surfaces / thinning / rounded corners / manufactured from a thin sheet / vent hole marks / pips	**1**
	iii	intricate detail / flash / sprue marks / injection point mark / ejector pin marks (circle / circular marks) / complex 3D form / webs / nipple / fettling marks / tips / solid / etc.	**1**
	iv	uniform cross–section / feed marks (regular pattern of marks) / intricate profile	**1**
b		machinery costs / mould or tooling costs / workforce training costs / installation costs / **wasted** material (thermosets / timber) as equipment is fine-tuned for production Any other suitable response. 1 mark per correct response up to total of 2 marks.	**2**
			6

Q4		Marks
	Candidate's responses to this question should be appropriate and **relevant** to the iPad / tablet shown. Examples are given below for each part of the question, (i) – (v). i) Fingertip size – so that the user can easily select icons and operate the controls on the screen ii) Screen size – it has to be large enough to display relevant information effectively iii) Portability – it has to be small / lightweight to ensure it can be transported easily / fit in your bag iv) Battery life – it has to last a suitable time away from a mains power electrical point / should be able to watch a movie away from home v) Aesthetics – the use of the white **colour** makes it look a modern product (reference to aesthetic terms or appearance linked to sales required here) **Vague or generic responses attract no marks** e.g. aesthetics – it has to look good to the consumer 1 mark per correct response up to total of 5 marks.	**5**

Q5		Marks
a	Candidates **must** refer to both primary and secondary functions and exemplify each correctly to attract two marks. Primary function is to show the user where the bus will stop and/or provide seating/shelter/comfort whilst waiting for the bus. Secondary function is to provide areas for advertising / timetables / act as a meeting point etc. Candidates may exemplify primary and secondary functions of the shelter using a mixture of the above. A generic description of primary and secondary function, without reference to the shelter may attract 1 mark. Candidates may simply **list** two aspects of the bus shelter, without any **explanation** of the difference. This may attract 2 marks. **Description marked on a 2-1-0 scale**	**2**
b	Candidates may choose to respond to this question by examples of things that would either shorten or extend the life-span of a bus shelter. These may be grouped into the following categories: • Functional reasons • Environmental reasons • Durability reasons • Safety reasons • Cost/economic reasons • Aesthetics reasons • Material reasons • Manufacturing/production reasons e.g. The **materials** used to make the shelter should be **hard-wearing** (1 mark), be able to withstand **the weather** (1mark) and be **vandal-proof** (1 mark). **Total 3 marks** • accidental damage (crash) • bus route changing (lengthen or shorten) • level of maintenance of shelter • location (rural or urban) **Description marked on a 3-2-1-0 scale.** Candidates may simply **list** three relevant issues with no description. e.g. Durability, safety, cost. Three issues will attract 1 mark. One or two issues scores zero.	**3**
		5

Q6		Marks
a **i**	e.g. • It is important because designers will not make any money out of their ideas / inventions if they are not protected. • There will be no prestige or fame for innovative ideas. • Someone else might steal their idea • Someone else might get the money from their idea. • etc. • 'to protect it'/ 'theft' scores zero **1 mark per correct response up to total of 1 mark.**	**1**
ii	e.g. • Holding the *'copyright' (*Posting the idea to a lawyer or yourself to remain sealed until challenged). • Establishing a *'design right'* • Registering a '*trademark'* • Being granted a *'patent'* • *'Registering'* the design • *'Confidentiality agreement'* **1 mark per correct response up to total of 2 marks**	**2**
b	Candidates should provide a **description** of one of the following areas: • Celebrity endorsement • Buy one, get multiple free (BOGOF) • Website pop-ups getting you involved in product • Prize draw with purchase • Text hotline with code • Telesales • Try before you buy / test-drive • Obsolescence • etc. Clear description of technique attracts 2 marks. Vague answers which display an appropriate level of knowledge attract 1 mark. Where candidates simply **list** one or two techniques with no **description**, this will attract a maximum of 1 mark. **Description marked on a 2-1-0 scale.**	**2**
		5

[END OF MARKING INSTRUCTIONS]