

# Markscheme

November 2016

Design technology

Higher level

Paper 3

11 pages

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## General Marking Instructions

1. Follow the markscheme provided, award only whole marks and mark only in **RED**.
2. Make sure that the question you are about to mark is highlighted in the mark panel on the right-hand side of the screen.
3. Where a mark is awarded, a tick/check (✓) **must** be placed in the text at the **precise point** where it becomes clear that the candidate deserves the mark. **One tick to be shown for each mark awarded.**
4. Sometimes, careful consideration is required to decide whether or not to award a mark. In these cases use RM™ Assessor annotations to support your decision. You are encouraged to write comments where it helps clarity, especially for re-marking purposes. Use a text box for these additional comments. It should be remembered that the script may be returned to the candidate.
5. Personal codes/notations are unacceptable.
6. Where an answer to a part question is worth no marks but the candidate has attempted the part question, use the “ZERO” annotation to award zero marks. Where a candidate has not attempted the part question, use the “SEEN” annotation to show you have looked at the question. RM™ Assessor will apply “NR” once you click complete.
7. If a candidate has attempted more than the required number of questions within a paper or section of a paper, mark all the answers. Scoris™ will only award the highest mark or marks in line with the rubric.
8. Ensure that you have viewed **every** page including any additional sheets. Please ensure that you stamp “SEEN” on any additional pages that are blank or where the candidate has crossed out his/her work.
9. Mark positively. Give candidates credit for what they have achieved and for what they have got correct, rather than penalizing them for what they have got wrong. However, a mark should not be awarded where there is contradiction within an answer. Make a comment to this effect using a text box or the “CON” stamp.

## General Marking Instructions

### Subject Details: Design technology HL Paper 3 Markscheme

#### Mark Allocation

Candidates are required to answer **ALL** questions in Section A (total **[20 marks]**) ONE question in Section B **[20 marks]**. Maximum total = **[40 marks]**.

#### Markscheme format example:

Question			Answers	Notes	Total
4.	b	ii	the displacement and acceleration ✓ are in opposite directions ✓	Accept <b>force</b> for <b>acceleration</b> .	2

- Each row in the “Question” column relates to the smallest subpart of the question.
- The maximum mark for each question subpart is indicated in the “Total” column.
- Each marking point in the “Answers” column is shown by means of a tick (✓) at the end of the marking point.
- A question subpart may have more marking points than the total allows. This will be indicated by “**max**” written after the mark in the “Total” column. The related rubric, if necessary, will be outlined in the “Notes” column.
- An alternative wording is indicated in the “Answers” column by a slash (/). Either wording can be accepted.
- An alternative answer is indicated in the “Answers” column by “**OR**” on the line between the alternatives. Either answer can be accepted.
- Words in angled brackets < > in the “Answers” column are not necessary to gain the mark.
- Words that are underlined are essential for the mark.
- The order of marking points does not have to be as in the “Answers” column, unless stated otherwise in the “Notes” column.
- If the candidate’s answer has the same “meaning” or can be clearly interpreted as being of equivalent significance, detail and validity as that in the “Answers” column then award the mark. Where this point is considered to be particularly relevant in a question it is emphasized by **OWTTE** (or words to that effect).
- Remember that many candidates are writing in a second language. Effective communication is more important than grammatical accuracy.
- Occasionally, a part of a question may require an answer that is required for subsequent marking points. If an error is made in the first marking point then it should be penalized. However, if the incorrect answer is used correctly in subsequent marking points then **follow through** marks should be awarded. When marking, indicate this by adding **ECF** (error carried forward) on the script. “ECF acceptable” will be displayed in the “Notes” column.
- Do **not** penalize candidates for errors in units or significant figures, **unless** it is specifically referred to in the “Notes” column.

**Section A**

Question		Answers	Notes	Total
1	a	less waste ✓ use of recycled materials ✓ renewable source of energy ✓ recyclable phone ✓ ease of disassembly ✓ reusable parts ✓ take-back legislation ✓ no battery ✓	Award [1] for each of two ways listed that that Nokia's designs may be considered sustainable. [2 max]	[2 max]
	b	create a competitive advantage in the market/improve reputation/brand loyalty ✓ by demonstrating their commitment to sustainability ✓  transparency ✓ to attract investors/increase the trust of internal and external stakeholders ✓  to provide information linked to a long-term sustainability strategy ✓ about the company's sustainability goals, strategy, programmes and performance ✓  advertising/promote Nokia's green credentials ✓ use it in advertising campaigns to encourage 'green fans' to buy the Nokia's products ✓	Award [1] for identifying a reason why Nokia would use sustainability reporting and [1] for a brief explanation.	[2 max]

<p><b>c</b></p>	<p>Material constraints ✓  reduced variety / number of different materials / dematerialization ✓  recyclable, easy and economical to recycle ✓  will incur additional costs to company ✓ <b>[3 max]</b></p> <p>Design for ease of disassembly ✓  use of temporary joining techniques ✓  and a reduction in the number of parts to be separated ✓</p> <p>There is a need for waste management / collection system in place ✓  As products will be returned at the end of their life ✓  which incurs additional costs ✓</p> <p>Take back standards vary from country to country ✓  this may not be cost effective ✓  since Nokia has to set up a logistical system to collect their products as well as  facilities to recycle them ✓</p>	<p><i>Award [1] for each of three distinct points  in an explanation of the implications of  take-back legislation for designers of the  Nokia "Green Core" phone.</i></p> <p><i>[3 max] for each separate and distinct  explanation</i></p>	<p><b>[6 max]</b></p>
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Question		Answers	Notes	Total
2	a	attracts new customers and encourages loyalty amongst existing customers ✓ helps the company stand out from its competitors ✓ presents the company as distinctive and reliable ✓	<i>Award [1] for each benefit listed of the Dyson company creating a distinctive brand identity. [2 max]</i>	[2 max]
	b	Focus on consumers with similar tastes/characteristics ✓ to create products that better relate to their wants and needs/to create more suitable marketing campaigns ✓ create different products ✓ to meet different target market groups specific needs/increase sales ✓	<i>Award [1] for identifying a reason why the Dyson company would use market segmentation as part of its product development strategy and [1] for a brief explanation.</i>	[2 max]
	c	the vacuum cleaners would share common parts and assemblies ✓ there is the potential for cost savings ✓ the vacuum cleaners family members pass through similar processing steps and common equipment ✓ bulk purchasing brings cost reductions/increases economies of scale ✓	<i>Award [1] for identifying a reason why the production of Dyson's vacuum cleaner family leads to improved cost effectiveness for the Dyson company and [1] for a brief explanation.</i>	[2 max]

<p><b>d</b></p>	<p><b>Product development:</b>                  Product development is less risky than diversification /more likely to be achievable ✓                  since Dyson would use incremental rather than radical design in the development of                  new vacuum cleaners ✓</p> <p>Product development would enhance Dyson’s market share ✓                  as new vacuum cleaners use newer technologies / aesthetics / match existing                  customers’ needs ✓</p> <p><b>Product diversification:</b>                  The brand image of Dyson is well respected ✓                  making diversification more straight forward as new potential customers are aware of                  the quality of the Dyson brand ✓</p> <p>Diversification may bring the greatest rewards ✓                  as Dyson is potentially accessing a completely empty market ✓</p> <p><b>Combination:</b>                  For product development, Dyson developed new vacuum cleaners (cylinders,                  cordless, and hand-held) for their existing market ✓                  While diversification involved developing new products (hand dryers, fans and                  heaters) for new markets ✓                  this way Dyson Company maintains its market leading position;                  while reducing the risk of depending on just one strategy ✓</p>	<p><i>Award [1] for each distinct point                  explaining why product development,                  diversification or a combination of both                  would be used up to a maximum of [4]</i></p> <p><i>If only product development or                  diversification are addressed, award a                  maximum mark of [2]</i></p>	<p><b>[4 max]</b></p>
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**Section B**

Question	Answers	Notes	Total
<p><b>3 a</b></p>	<p>Accept UCD stages:                      research ✓                      concept ✓                      design ✓                      implementation ✓                      launch ✓</p> <p>Accept elements within the UCD stages:                      focus groups ✓                      user trials ✓                      usability testing ✓                      personae/scenarios ✓</p> <p>Accept UCD Principles:                      understand users, tasks and environments ✓                      users are involved throughout design and development ✓                      iterative ✓                      addresses the whole user experience ✓                      multi-disciplinary teams ✓                      inclusive ✓</p> <p>Accept a definition of UCD</p>	<p><i>Award [1] for each element of UCD listed. [2 max]</i></p>	<p><b>[2 max]</b></p>
<p><b>b</b></p>	<p>does not replicate the outdoor environment ✓                      environmental conditions, such as wind and rain, affect the performance of the football ✓</p>	<p><i>Award [1] for identifying a reason why only relying on a usability lab may lead to the Adidas football not functioning as intended and [1] for a brief explanation.</i></p>	<p><b>2</b></p>
<p><b>c</b></p>	<p>can generate high quality qualitative data ✓                      this will further inform the development of the new product ✓</p> <p>Data is based on open-ended research/it is not predetermined ✓                      due to the interaction between the participants ✓</p>	<p><i>Award [1] for identifying a reason an advantage of the data obtained from a focus group when using user-centred design approaches in the early stages of development of a new Adidas football and [1] for a brief explanation.</i></p>	<p><b>[2 max]</b></p>

<p><b>d</b></p>	<p><b>Colours and ribbon design of football:</b>                  Adidas included multi/fun/vibrant colours/ribbon ✓                  to associate the design with the hosting nation's culture/identity/heart and soul of Brazil ✓                  Which attract users/enhance like-ability/make the football more desirable ✓</p> <p>Adidas has minimal influence on the design of the football ✓                  since it is a standardised product ✓                  but choice of colours / symmetrical panels make it distinct/stand out ✓</p> <p><b>Marketing:</b>                  The Brazuca football was developed for use in the 2014 World Cup/major football competitions ✓                  using the international popularity/emotions for football games ✓                  reinforces the Adidas identity ✓</p>	<p><i>Award [1] for each of three distinct points in an explanation of which design for emotion impacts on the design <b>and</b> marketing of the Adidas Brazuca football.</i></p> <p><i>[3 max] for each separate and distinct explanation</i></p> <p><i>Mark as [2 + 3] or [3 + 2].</i></p>	<p><b>[5 max]</b></p>
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<p>e</p>	<p><b>Quality control:</b>                  Adidas created a process control system to continuously measure output against established quality standards✓                  automated machinery is used and inspection / monitoring is carried out by workers✓                  to minimize defective parts / waste / variations / rework parts not within tolerance✓</p> <p><b>Statistical process control:</b>                  uses / applies statistical tools to monitor process outputs✓                  uses / applies statistical tools to control process inputs✓                  detects when the process mean has moved away from the target✓                  detect when item to item variability has increased✓ <b>[3 max]</b></p> <p><b>Quality assurance:</b>                  focuses on providing confidence that all quality requirements will be fulfilled✓                  implements activities / actions within its quality system to meet football quality requirements✓                  provides means of guaranteeing that the football it offers meets the accepted quality standards✓                  ensures the quality of all activities (quality of raw materials, machinery, parts, assemblies, products) from design to inspection✓ <b>[3 max]</b></p>	<p><i>Award <b>[3 max]</b> for each area (quality control, statistical process control and quality assurance).</i></p> <p><i>[3 max] for each separate and distinct explanation.</i></p>	<p><b>[9 max]</b></p>
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