General Certificate of Education
Design and Technology: Product Design 3D

PROD3

Report on the Examination

2550

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General Comments:

The structure of the paper seems imbedded now with very few rubric infringements throughout. Many candidates continue to view the paper as requiring a purely essay based response and although bullet pointed responses are not advised the use of supportive sketches/diagrams is often essential to access the higher marks. This was evident in the better responses where the sketches were used to confirm understanding of the terms and the products mentioned.
When candidates used lists responses they generally gave limited or no explanation of the technical terms included in the list and therefore they were limited to a single mark.
Candidates often need to use a range of relevant products within their responses they should not rely on a single product which they feel fulfils all aspects of the subject specification. Some candidates used the iPhone within each question.

Question 1

01 The main focus of this question was ergonomics and inclusive design. The best responses recognised this and used a range of example products that gave them the opportunity to discuss how products are made to be intuitive for all, including the young (without language), and also for the international market, using standardised symbols. The use of texture to improve grip was a common response, although better responses referred to the addition of braille for the visually impaired, the use of texture to assist with location recognition such as when at a road crossing or the marking given to a 5 on a remote control to help find a datum when adjusting channels in the dark.

Candidates who underperformed here often failed to address the reference to product usability and referenced aesthetics for colour. Also when referring to examples there tended to be repetition of the colours and symbolism mentioned, for example green for go and red for stop on traffic lights and on a mobile phone. This could have been expanded to refer to health and safety for traffic lights due to language barriers, but in general was not.

Product selection for this question was key with candidates who used products designed for the mass public performing better. The recognition that designers combine all three elements within products to increase the usability gave greater mark access. Use of road signs, traffic lights and other objects that people interact with every day and reference to the multi-cultural nature of society and getting beyond language barriers was evident in high mark responses.

02 The question refers to technological developments which enabled the development of modern electronic products and it was anticipated that candidates would refer to developments in battery technology, the transistor or manufacturing techniques. However, many candidates did not understand the term technological development and talked about specific products, such as the iPhone or Sony Walkman. Often the technologies referenced were highly repetitive with terms such as ‘microchip’ used.

Question 2

03 The question refers to the benefits of 3D CAD software. However, candidates largely failed to compare CAD use with the alternatives such as hand sketching. It was common for candidates to list 'machines' such as CNC routers, CNC lathes etc. This name dropping shows limited understanding of the purpose of the process. The majority of candidates recognised CAD as being useful for generating realistic renderings, but better candidates referred to the use of virtual testing and the ability to input specific material properties so that a product could be tested in a proposed environment. It was pleasing to see some reference to the use of CAD to improve concurrent engineering on an international level and also reference to the use of standardised parts that could be inserted into new CAD models, thus saving time.

Question 3

04 The difference between QA and QC seems to confuse candidates, who tended to refer to 'checking' products with machines. There was a general understanding that the checking intervals would change depending on the volume produced. If a question states a technical term such as Quality Assurance, invariably there will be a mark allocation for a correct definition of the term. Also when structuring a response defining the term gives a good starting point from which to expand.

Although this is a very different question to 03 there are aspects that overlap and weaker candidates failed to recognise the link. There was very little reference to use of computer testing or rapid prototyping as a preliminary checking procedure prior to production.

The reference to two different scales of production was seen as a way for candidates to compare relevant specific techniques for maintaining quality, such as through measuring with a tape measure or with a go-no-go gauge. Higher level responses recognised the benefits of each for the different scales of production e.g. the tape measure can be adjusted to measure different aspects of the product, but is long winded and relies on accuracy of sight, whereas the go-no-go gauge is fixed and can be operated with quickly, but only for a single set dimension.

Question 4

05 The question asked candidates to write a material specification for a domestic mop bucket. To gain top marks candidates were required to give relevant specific points with explanations of their relevance to the product. This was evident within reference to chemical resistance, where better responses referred to corrosive chemicals such as bleach and its replacements rather than just chemicals as a general term. Weaker responses used generic terms such as lightweight and cheap, which were not explained.

06 This was a very popular question and when candidates were able to use diagrams to support their answers they performed well. Many candidates recognised the manufacturing processes for the metal bucket showing a good understanding of crimping and press forming techniques. The injection moulding process was well described with the better

responses showing an understanding of how the high initial investment cost for injection moulding was less important as the scale of production increased. Where candidates recognised the reduced number of components used in the polymer bucket, and that due to the lack of joints leakage was very rare, they invariably accessed higher marks.

Question 5

07 The question referred to the use of patents and candidates who performed well often referred to Dyson as their example. Better responses used example products and recognised the limited length of a patent and why a company may see this cost as necessary. Some responses went into detail about what could be patented and showed a good level of understanding that they could back up with specific case studies.

08 Candidates who answered this question often used the car industry as their example, with which they often described Japanese manufacturing techniques such as Just In Time, Kaizen and Kanban. Where candidates failed to maximise their marks they mentioned terms in a list situation and failed to expand on the specific methods of operation. Some responses referred to the assembly line as used by Ford motor company in the early 20th century. However, if candidates referred to the industrial revolution they were unable to access marks.

Question 6

09 Responses to this question were varied, with many candidates confused by the term 'design movement/period' and using specific products such as the Austin Mini or iPhone. When responses talked about recognised movements/periods such as Bauhaus or Art Deco they were generally able to use several specific examples to back up their points. Unfortunately candidates remain hesitant when including sketches, which in this question were essential to show their understanding of the products they referred to.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.

Converting Marks into UMS marks

Convert raw marks into Uniform Mark Scale (UMS) marks by using the link below.

UMS conversion calculator www.aqa.org.uk/umsconversion