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# **GCE AS EXAMINERS' REPORTS**

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## **DESIGN & TECHNOLOGY AS**

**SUMMER 2023**

Grade boundary information for this subject is available on the WJEC public website at:  
<https://www.wjecservices.co.uk/MarkToUMS/default.aspx?l=en>

### **Online Results Analysis**

WJEC provides information to examination centres via the WJEC secure website. This is restricted to centre staff only. Access is granted to centre staff by the Examinations Officer at the centre.

### **Annual Statistical Report**

The annual Statistical Report (issued in the second half of the Autumn Term) gives overall outcomes of all examinations administered by WJEC.

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**DESIGN & TECHNOLOGY**  
**GCE AS**  
**Summer 2023**  
**COMPONENT 1 – PRODUCT DESIGN**

**General Comments**

There have been three formal papers sat in 2018 and 2019 and now 2022. Candidates were not provided with advanced information to aid revision and preparation for the examination. The paper was well received by candidates and the majority of candidates answered all questions on the paper.

Candidates' use of terminology and technical language together with knowledge of materials and manufacturing processes is again improving with several scripts demonstrating this in their responses.

There is a clear indication that the longer style questions, and those questions with command words such as analyse and evaluate, generally require more structure and planning, whilst ensuring that ALL elements of the question are covered. All the better candidate responses consistently made sound and valid justifications to the points that they are making.

Centres should continue to advise candidates to use the mark allocation indicated at the end of each question to guide the depth of response and manage time effectively.

Candidates should be advised to read the question carefully in order to ensure that all elements are understood and are included in their responses.

There were several instances where the responses throughout were not detailed enough and often made too few points to gain the higher level of marks, particularly on the higher mark questions.

Analyse questions require candidates to show evidence of deconstructing information to find connections and provide logical chains or reasoning and to then apply this relevantly to the question.

Evaluate questions require the candidates to show clear evidence of appraisal and/or making judgements and then apply this to technical principles.

Candidates should be discouraged from using bullet points or listing from extended written responses and particularly with analyse and evaluate questions, this was seen in a few candidate responses on the longer mark questions. The use of bullet points or listing can limit the candidate's ability to access the higher mark bands in analyse and evaluate questions even with a good breadth of knowledge and understanding of technical principles. Well-structured and planned responses score well. These responses contain clear, and specific details relating to the question. They also showed breadth and depth in their knowledge and understanding of technical principles across the specification. Several candidates require more structure and planning in order to organise information clearly and coherently. In many cases the length of responses was too short to show any real depth of understanding.

Centre's need to ensure that candidates have the mathematic skills to answer mathematical questions in the paper; they also must ensure that candidates can apply this skill correctly from the information provided in the question. In several cases, candidates knew the mathematical skill but were unable to apply them correctly. In some cases, candidates did not follow all the steps required to gain full marks. Centres are advised to ensure candidates are aware of mathematical questions that will require conversions.

### Comments on individual questions/sections

- Q.1**
- (a) This was a popular question and well answered in the paper. Better responses gave clear properties that connected the material properties with the product purpose, weaker responses from candidates stated an appropriate property but did not give an appropriate justification, or the property given did not relate to the product purpose.
  - (b) This was a popular question. The better responses gave good examples that were relevant and well justified.
  - (c) This was a popular question, and the vast majority of candidates understood the advantages of batch production in the manufacturing of the cake serving set.
- Q.2**
- (a) This was a popular question that was generally well answered. The best responses gave relevant and clear examples of the advantages of using CAD modelling in the design of the hairdryer. Good examples included simulations, collaborative design, speed and low cost as compared to 3D modelling. Some candidates did confuse CAD modelling with CAM [rapid prototyping].
  - (b) This question was well answered, most candidates were able to explain how the disassembly of an existing hairdryer would help the manufacturer in the design of the hairdryer.
  - (c)
    - (i) This was one of the most popular questions in the paper and was well answered by nearly all candidates. Candidates were able to apply the given formula to calculate the power rating.
    - (ii) A number of candidates were able to correctly calculate the cost of running the hairdryer for 15 minutes and complete the steps necessary. Several candidates were able to convert Watts to Kilowatts, but then proceeded to incorrectly apply the correct timing.
    - (iii) Similar to (ii) successful candidates were able to correctly calculate the winter usage and apply a percentage reduction for summer usage. A number of candidates incorrectly applied a percentage reduction to the power rating.
- Q.3**
- (a) This was a popular question although there were significant variations in the candidate's responses. Good responses detailed the process of rotational molding, and the supporting diagrams were clear, well labelled, and useful in exemplifying their answer.

In weaker responses, candidates' diagrams were not so clear and not fully labelled and important stages of the process were missing. Some candidates mixed up different polymer processes and therefore did injection or blow molding. A small number of candidates did not include diagrams to exemplify their answer.

- (b) This was a well answered response, most candidates were able to justify why polyethylene was a suitable choice of material for the product. Some candidates did not focus on properties of the material but suitability such as cheap to manufacture.

**Q.4** (a) This was a mixed response in terms of candidates' answers. In better responses candidates were able to name a suitable material based on the symbol shown and were able to explain what the symbol meant. In weaker responses, candidates named a material for a different number symbol and did not adequately explain what the symbol meant.

- (b)
  - (i) Most candidates were able to correctly calculate the volume of the bottle up to the fill line. In stronger responses candidates were able to convert to litres and then centiliters; a large proportion of candidates were incorrect in their conversions.
  - (ii) This was well answered by most candidates who were able to apply a percentage increase to the cost of manufacture.

- (c) This was well answered by most candidates who were able to explain why blow molding the bottles would be a suitable method of production.

**Q.5** (a) Many candidates did not have sufficient knowledge and understanding of sintering as a process for manufacture and as a consequence were unable to provide a valid reason why this process would be suitable.

- (b) Well answered responses by candidates related the properties of high carbon steel to the bevel gears. Less well answered responses named properties that were not appropriate for the bevel gears.  
Most candidates answered this question well, explaining how 3D modelling can aid an engineer in prototyping components such as the bevel gears.

**Q.6** This was a popular question although one of the least successful in terms of candidate responses.  
In the better responses to this question, candidates were able to demonstrate their knowledge and understanding of the Art Deco style and explain characteristics of the DAB radio that fit into this design style. Good points were made as to why consumers may opt to own a retro style.  
Weaker responses did not fully discuss the characteristics of the DAB radio that relate to the Art Deco style or made too few points to gain the full marks.

**Q.7** (a) This was a popular question with a variable response in terms of the whole question. Many candidates demonstrated limited knowledge and understanding of smart materials and were not able to explain how they might be used in the design and manufacture of the hand-held tablet. Stronger responses had clear and detailed analysis with useful examples to support their response.  
Weaker responses did not expand on their points or support their answers and had too few points for discussion. A number of candidates did not have the knowledge and understanding to gain full marks.

- (b) A variable response in terms of the whole question. In good responses candidates clearly demonstrated their knowledge and understanding of technical principles to the context of design obsolescence, making pertinent points in relation to the manufacturer and the consumer. They made sound judgements and evidenced their ability to evaluate. Weaker responses had too little points made and did not offer any evaluative part to their response, creating an explanation, which also was limited to the effects of both the consumer and manufacturer.

**Q.8** This was a popular question and was well attempted by a large number of candidates, although this question was one of the least successful in terms of responses. In better responses, candidates were able to clearly discuss batch production tools and processes identifying their purpose and benefits in relation to the product shown. In weaker responses, candidates did not include enough points, a small proportion of candidates heavily discussed how the Led Lamp could be made but was not specific to batch production tools and processes. Several candidates did not have the knowledge and understanding to gain full marks.

**Q.9** This was a popular question in the paper. In good responses the candidates demonstrated their knowledge and understanding of the technical principles related to the context of solar lighting and mains electric lighting. Better responses made sound judgements and evidenced their ability to evaluate using the framework of advantages and disadvantages. Weaker responses had too little points made and did not offer any evaluative part to their response, creating an explanation, additionally several candidates focused heavily on solar lighting rather than both as in the question.

**Q.10** This was a popular question in the paper. Better responses candidates demonstrated their knowledge and understanding of manufactured boards and were able to discuss the advantages and disadvantages related to modern home furniture. Weaker responses lacked a coherent structure and focused on too few examples or points for an extended answer. Several candidates did not have the knowledge and understanding to gain full marks. Some candidates wrote their response as a list rather than an extended prose.

### Summary of key points

- Ensure questions are read and clearly understood. Responses need to cover all aspects of the question, especially if there are two or more 'parts' to a question.
- Extended responses require depth of knowledge, understanding and skills, so repeating answers or content will not access additional marks. Broad and balanced answers work best, with illustrations or examples where possible.
- Avoid bullet pointed lists for extended essay type answers – use continuous writing.
- Candidates benefit from practicing answering short low tariff and longer higher tariff questions. The Question Banks resource is FREE and will help prepare candidates for examinations.

## **DESIGN & TECHNOLOGY**

### **GCE AS**

**Summer 2023**

## **COMPONENT 1 – FASHION & TEXTILES**

### **General Comments**

One centre with 10 candidates sat this paper.

The overall response to this paper was well received with many pupils demonstrating the in-depth technical knowledge and understanding that is required at this level.

In some cases, it was evident that candidates had not prepared thoroughly for the examination and in the depth that might be expected. Some lacked the technical knowledge and understanding that would have enabled them to respond at a higher level.

Virtually all candidates attempted all questions, indicating that candidates had managed the time period effectively.

There are useful resources available when analysing candidate performance in this unit, particularly the Item Level Data which is centre specific and allows a full statistical breakdown of candidate performance question by question. Centres can also compare their performance against ALL centres to identify strengths and weaknesses in delivery of this specification. The Online Examination Review (OER) is also available via the EDUQAS website. This e-resource contains marked exemplar responses from scripts, where examiners marks are available, together with marking criteria and reasons why marks have been awarded and where responses lack the depth to access further marks. This is a powerful teaching tool for classroom activity with candidates. Useful teaching resources to support learners in the classroom are also available via the EDUQAS website in the resource section. Here you will find knowledge organisers and interactive teaching resources.

### **Comments on individual questions/sections**

- Q.1** This question was very well answered and was considered accessible with the majority of candidates achieving full marks. All candidates were able to use notes and diagrams to explain how Gore-Tex worked. Candidates were able to use the correct terminology and diagrams were detailed. Most candidates were able to describe one advantage to the user. Some candidates gave advantages which were not suitable for the named product.
- Q.2** Responses to this question were positive overall and accessible for most candidates. Candidates clearly knew what digital printing was and were able to describe the advantages. Most candidates scored well in this question. Most candidates gave suitable quality checks. Some candidates gave safety checks. There seemed to be some confusion in places. Candidates were able to calculate surface area and cost of ink. Candidates showed workings.
- Q.3** Most candidates scored well on this question. Candidates were able to explain how you would construct a flat fell seam. Sketches were clear and well thought out. Most candidates were able to explain why machine embroidery might have been used instead of applique.

- Q.4** All candidates gave this question a go, but lost marks in the two maths questions. Where candidates showed correct workings but incorrect answers, marks were awarded for workings. Candidates showed good knowledge of bias binding and were able to give reasons why bias binding had been used.
- Q.5** Many candidates failed to score well in this question. Candidates were not able to fully answer this question. Most candidates did not know the meaning of 'bias' and so were not able to give reasoning. Candidates were able to give properties of satin and polyester, but most did not understand a satin weave.
- Q.6** Responses to this question were positive overall and accessible for most candidates. Candidates were able to describe the importance of including measurable performance criteria in a design specification. Most candidates were able to give examples of measurable performance criteria and in most cases justified the importance of each example.
- Q.7** This question was well answered and was considered very accessible with many candidates achieving high marks. Candidates showed good understanding and were able to describe the benefits of reverse engineering/disassembly to the designer. Most candidates were able to evaluate the use of secondary research when analysing existing products.
- Q.8** This question was very well received by all with the exception of one candidate. Candidates showed good technical knowledge of ethical and sustainable design and were able to communicate this effectively.
- Q.9** Candidates demonstrated sound knowledge of mechanical finishes overall. Some candidates included examples of Chemical finishes. Marks were not awarded for this. Candidates were able to give examples.
- Q.10** Almost all candidates answered this question well. Answers demonstrated good knowledge of anthropometric and ergonomic data and how it is used when designing a life jacket. Written communication was detailed and included many examples.

### **Summary of key points**

General weaknesses in candidate performance include:

- Failure to develop a detailed response to gain the higher marks.
- Calculation questions require more practice.
- Weakness in specific textile related knowledge in some areas.
- Failure to 'explain.' An 'explanation' requires a fact and an elaboration of that fact.

Well-planned and structured responses score well. These responses contain clear, and specific details relating to the question. Several candidates' responses require more structure and planning to organise information clearly and coherently and attain higher marks.

## **DESIGN & TECHNOLOGY**

### **GCE AS**

**Summer 2023**

## **COMPONENT 2 – NEA – DESIGN AND MAKE**

### **General Comments**

With a return to a post covid concession free cohort, the work moderated at AS Level component 2 has overall been well interpreted. Centres have generally re-adapted well to the original format following a testing period for all. Moving forward, consideration to the following comments and recommendations should be made.

Centres need to continue ensuring that candidates explore and analyse a range of project possibilities originating from the initial board prescribed contextual challenges. Candidates must then identify and develop their own briefs.

The aim of the iterative process is to allow the students to consider a range of problems and briefs based on analysis of client requirements, research and deconstructing existing products and problems. A notable issue arising this year was the need for candidates to ensure that their specifications are 'working documents' and contain some evaluative comments and ongoing iteration throughout the process. It would be acceptable to produce an initial specification with furthermore precise measurable criteria added once further investigation and iteration has been completed.

### **Comments on individual questions/sections**

Design folios again were generally well laid out with good examples of the iterative process being followed by many centres. This was evident in A3 folios and some good use of sketchbooks. Centres should continue to encourage candidates to model, develop and iterate as much as possible. These models, tests, concepts could take on the form of a physical model or a 3D CAD model. Sketch books must also continue to be developed and encouraged as an iterative working tool, marks for good use of sketch books should be rewarded in the generating and developing ideas section. At AS level reference to the implications of the design and its impact on social, moral and sustainability issues should be evident. There is no directive as to where the design process should start, and modelling or deconstructing could be the starting point for designing.

Product solutions and prototypes across many centres were appropriate however, centres should consider the timing and marks allocated to their prototype. Products should still represent a finished functioning prototype. When centres are making concept models, the products, regardless of function, must look and feel like a real product. Quality of finish is vital at this level. Could the product be taken to an investor? Please also note, only the finished prototype/s can have marks awarded in this section. Marks cannot be awarded for models and test pieces; these are rewarded in 'generating and developing design ideas.' Along with the finished prototypes centres should ensure that the logical sequence and timeline completed should be in a pre-emptive context.

Centres should also ensure that flow charts and manufacturing plans contain sufficient detail, considering the '3<sup>rd</sup> party' aspect. Moderators are seeing Gantt charts as a means of planning the manufacturing; although this is an acceptable method, a simple coloured box on a chart is meaningless unless it is reinforced with realistic detail including reference to H&S, QC and timings that reflect the true manufacturing process. The logical sequence should not be confused with the project planning noted in section A.

The depth and quality of evaluations varies across centres, a consideration of the time apportioned to this should be revised by many centres when taking into account the marks available. In general centres need to ensure that time is placed on evidencing, testing and user trials and live feedback from the proposed intended users. Good examples are of using video evidence, this has been a successfully used tool by many. Consideration here should also be made to how the product could better meet the needs of the user throughout its life cycle. Modifications should be fully realised in annotated sketches or CAD presentations.

### **Summary of key points**

- A range of initial potential design briefs should be identified from the contextual challenges.
- Initial specifications must be annotated and include developed, specific measurable criteria following on from research and iteration.
- Encourage more modelling and testing of concepts to aid the iterative process. Including CAD modelling.
- Continue to develop the use of sketchbooks as an iteration tool.
- The journey candidates have followed should be clear throughout the folio and sketch book.
- Concepts and prototypes of designs made can only have marks awarded in the 'generating and developing ideas' section.
- The final concepts and prototype should look and feel like a real product. Quality of finish is important. Could the product be taken to an investor?
- Logical sequences should be pre-emptive and should be sufficient for a 3<sup>rd</sup> party to make the product.
- Evaluations should contain end testing and user trials with clear suggestions of possible modifications to the product. Use of video evidence here can be highly beneficial.



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