

New
Specification



Rewarding Learning

**ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2017**

Technology and Design

Assessment Unit AS 1

assessing

Design and Materials

[STE11]

MONDAY 22 MAY, MORNING

**MARK
SCHEME**

General Marking Instructions

Introduction

The main purpose of the mark scheme is to ensure that examinations are marked accurately, consistently and fairly. The mark scheme provides examiners with an indication of the nature and range of candidates' responses likely to be worthy of credit. It also sets out the criteria which they should apply in allocating marks to candidates' responses.

Assessment objectives

Below are the assessment objectives for GCE Technology and Design.

Candidates should be able to:

- AO1** Demonstrate specific knowledge and understanding, be able to apply that knowledge and understanding in combination with appropriate skills in their designing, communicate ideas and outcomes, and demonstrate strategies for evaluation.
- AO2** Apply skills, knowledge and understanding of relevant materials to produce suitable and appropriate outcomes; communicate ideas and outcomes, and demonstrate strategies for evaluation.

Quality of candidates' responses

In marking the examination papers, examiners should be looking for a quality of response reflecting the level of maturity which may reasonably be expected of a 17- or 18-year-old which is the age at which the majority of candidates sit their GCE examinations.

Flexibility in marking

Mark schemes are not intended to be totally prescriptive. No mark scheme can cover all the responses which candidates may produce. In the event of unanticipated answers, examiners are expected to use their professional judgement to assess the validity of answers. If an answer is particularly problematic, then examiners should seek the guidance of the Supervising Examiner.

Positive marking

Examiners are encouraged to be positive in their marking, giving appropriate credit for what candidates know, understand and can do rather than penalising candidates for errors or omissions. Examiners should make use of the whole of the available mark range for any particular question and be prepared to award full marks for a response which is as good as might reasonably be expected of a 17- or 18-year-old GCE candidate.

Awarding zero marks

Marks should only be awarded for valid responses and no marks should be awarded for an answer which is completely incorrect or inappropriate.

Marking Calculations

In marking answers involving calculations, examiners should apply the 'own figure rule' so that candidates are not penalised more than once for a computational error. To avoid a candidate being penalised, marks can be awarded where correct conclusions or inferences are made from their incorrect calculations.

Types of mark schemes

Mark schemes for tasks or questions which require candidates to respond in extended written form are marked on the basis of levels of response which take account of the quality of written communication.

Other questions which require only short answers are marked on a point for point basis with marks awarded for each valid piece of information provided.

Levels of response

In deciding which level of response to award, examiners should look for the 'best fit' bearing in mind that weakness in one area may be compensated for by strength in another. In deciding which mark within a particular level to award to any response, examiners are expected to use their professional judgement.

The following guidance is provided to assist examiners.

- **Threshold performance:** Response which just merits inclusion in the level and should be awarded a mark at or near the bottom of the range.
- **Intermediate performance:** Response which clearly merits inclusion in the level and should be awarded a mark at or near the middle of the range.
- **High performance:** Response which fully satisfies the level description and should be awarded a mark at or near the top of the range.

Quality of written communication

Quality of written communication is taken into account in assessing candidates' responses to all tasks and questions that require them to respond in extended written form. These tasks and questions are marked on the basis of levels of response. The description for each level of response includes reference to the quality of written communication.

For conciseness, quality of written communication is distinguished within levels of response as follows:

Level 1: Quality of written communication is basic.

Level 2: Quality of written communication is good.

Level 3: Quality of written communication is excellent.

In interpreting these level descriptions, examiners should refer to the more detailed guidance provided below:

Level 1 (Basic): The candidate makes only a limited selection and use of an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialist vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

Level 2 (Good): The candidate makes a reasonable selection and use of an appropriate form and style of writing. Relevant material is organised with some clarity and coherence. There is some use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning clear.

Level 3 (Excellent): The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is organised with a high degree of clarity and coherence. There is widespread and accurate use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a sufficiently high standard to make meaning clear.

- 1 (a) **Factor of safety:** Is the safety margin (factor) that the designer has allowed for in the design above the level of which the component or product would normally be expected to withstand. [2]
- (b) **Tolerance of a component:** Is the maximum (+) and minimum (–) deviation from the actual value (e.g. dimensions) that will allow the component to perform its function correctly. [2]

Award [2] for a full explanation of each term and [1] for a limited explanation.

Correct alternative responses will be given full credit.

- 2 (a) Any **two** from the list below:
- Does not rust [1]
 - Good aesthetic appeal [1]
 - Good resistance to wear [1]
- [2]

Correct alternative responses will be given full credit.

- (b) Any **two** from the list below:
- Improves the aesthetic appeal of the cutlery [1]
 - Provides protection for the base material [1]
 - Reduces costs due to the selection of a cheaper base material [1]
- [2]

Correct alternative responses will be given full credit.

- 3 (a) Any **one** specific application from the list below:
- Chairs [1]
 - Flooring [1]
- [1]

Any **one** main advantage of plywood which makes it suitable for the chosen application from the list below:

- Plywood has good strength to weight ratio [1]
 - It is resistant to warping and cracking [1]
- [1]

Correct alternative responses will be given full credit.

- (b) Any **one** from the list below:
- Kitchen and bathroom worktops [1]
 - Furniture [1]
- [1]

Any **one** from the list below:

- MDF can be easily cut, shaped and drilled [1]
 - MDF is durable [1]
- [1]

Correct alternative responses will be given full credit.

AVAILABLE
MARKS

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- 4 (a) The difference between thermoplastic and thermosetting plastics is that thermoplastics can be reheated and shaped repeatedly, whereas thermosetting plastics once 'set' cannot be reheated to soften, shape and mould.

Award [2] for a full explanation and [1] mark for a limited explanation. [2]

Correct alternative responses will be given full credit.

- (b) Any **three** from the list below:

- High impact strength [1]
- Tough [1]
- Lightweight [1]
- Scratch resistant [1] [3]

Correct alternative responses will be given full credit.

- 5 An annotated sketch to include the following elements – Granules, hopper, motor, screw thread, heater, die and cooling area.

Level 3	Detailed annotated sketch with all the main elements of the extrusion process included.	[4]–[5]
Level 2	Both the sketch and the annotation are good. Some of the main elements of the extrusion process included.	[2]–[3]
Level 1	Limited sketch lacking detail and appropriate annotation. Only a few of the main elements of the extrusion process are included.	[1]
Level 0	The response is not worthy of any credit.	[0]

[5]

Correct alternative responses will be given full credit.

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6 Indicative content

Costs – Choice of materials can determine the quality of the final outcome. Expensive materials may be justified on the basis that they may be easier machined, processed and worked. Cost of some materials may result in the use of cheaper substitutes being used.

Environment – The environment (indoors or outdoors) in which the material is subjected to can influence selection. The stability of a material or the corrosive resistance of a material can greatly influence its suitability for a specific application. The environment in terms of the weather conditions can also play a significant role when selecting material.

Detailed selection and use of a writing form and style appropriate to the content. The content is organised with relevant points outlined for each area and use is made of appropriate technological vocabulary. The spelling, grammar and punctuation are accurate.	[6]–[8]
Good selection and use of a writing form and style which is mostly appropriate to the content. The content is organised with some relevant points outlined for each area and limited use made of appropriate technological vocabulary. The spelling, grammar and punctuation are mostly accurate.	[4]–[5]
Limited selection and use of a writing form and style to the content. The content is poorly organised with a very limited number of relevant points outlined for each area and little use is made of appropriate technological vocabulary. The spelling, grammar and punctuation are inaccurate.	[1]–[3]
The response is not worthy of any credit.	[0]

[8]

Correct alternative responses will be given full credit.

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- 7 (a) The flap could be closed using an adjustable side release buckle clip with straps stitched on the fabric.

Detailed annotated sketch representing an appropriate improvement to the overall design.	[4]–[5]
Both the sketch and the annotation are good. The idea represents an improvement but lacks the finesse appropriate for the product.	[2]–[3]
Limited sketch lacking detail and appropriate annotation. Difficulties in determining if the idea is appropriate and represents an improvement.	[1]
The response is not worthy of any credit.	[0]

[5]

Correct alternative responses will be given full credit.

- (b) A design could be based on a two part injection moulded foot bracket that could be secured using self-tapping screws to secure the foot to the bracket whilst securing both halves of the bracket.

Detailed annotated sketch representing an appropriate improvement to the overall design.	[4]–[5]
Both the sketch and the annotation are good. The idea represents an improvement but lacks the finesse appropriate for the product.	[2]–[3]
Limited sketch lacking detail and appropriate annotation. Difficulties in determining if the idea is appropriate and represents an improvement.	[1]
The response is not worthy of any credit.	[0]

[5]

Correct alternative responses will be given full credit.

Total

**AVAILABLE
MARKS**

10

40

