



Rewarding Learning

**General Certificate of Secondary Education
2012**

Manufacturing

Paper 1

Assessment Unit 3

assessing

Manufacturing Technology

[GMA31]

WEDNESDAY 6 JUNE, AFTERNOON

**MARK
SCHEME**

General Marking Instructions

Introduction

Mark schemes are intended to ensure that the GCSE examinations are marked consistently and fairly. The mark schemes provide markers with an indication of the nature and range of candidates' responses likely to be worthy of credit. They also set out the criteria which they should apply in allocating marks to candidates' responses. The mark schemes should be read in conjunction with these general marking instructions.

Assessment Objectives

Below are the assessment objectives for Manufacturing.

Candidates must:

- recall, select and communicate their knowledge and understanding of manufacturing in a range of contexts (AO1);
- apply skills, knowledge and understanding, including quality standards, in a variety of contexts, and plan and carry out investigations and tasks involving a range of tools, equipment, materials and components (AO2); and
- analyse and evaluate evidence, make reasoned judgements and present conclusions (AO3).

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 16-year-old which is the age at which the majority of candidates sit their GCSE 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 16-year-old GCSE 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.

Type 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

Tasks and questions requiring candidates to respond in extended writing are marked in terms of 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.

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.

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 limited.

Level 2: Quality of written communication is satisfactory.

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 (Limited): The level of accuracy of the candidates spelling, grammar and punctuation is limited. The candidate makes 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.

Level 2 (Satisfactory): The level of accuracy of the candidates spelling, grammar and punctuation is satisfactory. The candidate makes a satisfactory selection and use of an appropriate form and style of writing supported with appropriate use of diagrams as required. Relevant material is organised with some clarity and coherence. There is some use of specialist vocabulary.

Level 3 (Excellent): The level of accuracy of the candidates spelling, grammar and punctuation is excellent. The candidate successfully selects and uses the most appropriate form and style of writing, supported with precise and accurate use of diagrams where appropriate. Organisation of relevant material is excellent. There is excellent use of appropriate specialist vocabulary.

		AVAILABLE MARKS
1	<p>(a) Flat screen TV Digital radio (2 × [1])</p> <p>(b) Strimmer Lawn mower (2 × [1])</p>	<p>[2]</p> <p>[2]</p> <p>4</p>
2	<p>Rivet Gun: Used with a pop rivet to join different materials together</p> <p>Socket Set: To unlock and tighten different sizes of bolts Spanners accepted.</p> <p>Wood Turning Lathe: Used to create different profile on wood Wood lathe accepted.</p> <p>Tap and Die set: Used to create external and internal screw threads</p> <p>Bandsaw: Used to cut materials, i.e. wood/metal</p> <p>G. Cramp: Used to clamp pieces of material together (6 × [1]) 'Cramp' not accepted.</p>	<p>[6]</p> <p>6</p>
3	<p>(a) Monitoring of equipment Instructions for lifting materials Consideration for exposure to dust/vapours, etc. Other answers considered</p> <p>(b) Hazardous areas outlined Making sure guards are in place and fully functional Other answers considered</p> <p>(c) Making sure there are changing and washing facilities Sanitising/sterile wipes, employ cleaning staff Other answers considered</p>	<p>[2]</p> <p>[2]</p> <p>[2]</p> <p>6</p>
4	<p>(a) Property: It's flexible/soft Reason: It can flex without fracturing</p> <p>Property: Durable Reason: It can withstand all weathers and deterioration</p> <p>Property: Plasticity Reason: Makes it easy to mould</p> <p>Other answers considered Properties: (2 × [1]) Reasons: (2 × [2])</p> <p>(b) Can be reshaped to the original shape Flexible Other answers considered (2 × [2])</p>	<p>[6]</p> <p>[4]</p> <p>10</p>

			AVAILABLE MARKS	
5	(a)	(i) Good strength to weigh ratio Non-Ferrous metal Other answers considered (2 × [1])	[2]	10
		(ii) Ferrous metals contain iron and can rust Non-Ferrous metals don't contain iron therefore they do not rust	[2]	
		(iii) More durable in adverse weather conditions Other answers considered	[2]	
	(b) The product will be safe to use Reassurance for the customer Guaranteed Other answers considered (2 × [2])	[4]		
6	(a)	(i) Automated Production Lines	[1]	12
		(ii) Can work 24/7 Reduced workforce required Other answers considered (2 × [2])	[4]	
	(b)	(i) When designing products	[1]	
		(ii) Designs can be saved and used again Designs can be modified easily Other answers considered (2 × [2])	[4]	
	(c) Products are made accurately Less returns Other answers considered	[2]		
7	(a) Definition of automation	[2]	8	
	(b) High set-up costs Other answers considered	[2]		
	(c) Changes in working environment: Less staff required Staff need retrained [2] Other answers considered Improved Characteristics of products: Products made more accurately Intricate designs can be manufactured [2] Other answers considered (2 × [2])	[4]		

			AVAILABLE MARKS	
8	(a)	Internet Other answers considered	[2]	
	(b)	emails Fax machines Video conferencing Other answers considered	[2]	
	(c)	Precision measuring using robotics, 'CAM' award [1] Other answers considered	[2]	6
9	(a)	Workforce has been reduced by the increase of new technology Staff need retrained in new skills Other answers considered (2 × [2])	[4]	
	(b)	Pollution by emissions Waste not recycled properly Other answers considered (2 × [2])	[4]	8
10	(a) (i)	Products can be designed easier through the use of CAD Other answers considered	[2]	
	(ii)	Assembly and finishing is much easier through the use of robotics. Other answers considered	[2]	
	(b)	To reduce lead times To make sure that a fault is identified early on in the manufacturing process Other answers considered (2 × [2])	[4]	
	(c)	Through the Internet, emails, etc. Other answers considered	[2]	10
			Total	80