



General Certificate of Secondary Education
2014

Manufacturing

Paper 1

Assessment Unit 3

assessing
Manufacturing Technology

[GMA31]

WEDNESDAY 18 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	(a) Satellite dish Iphone (2 × [1])	[2]
	(b) Bike rack for a car Fire extinguisher (2 × [1])	[2] 4
2	(a) Claw hammer Used to hammer in and remove nails (2 × [1])	[2]
	(b) G cramp Use to clamp items together particularly when gluing (2 × [1])	[2]
	(c) Bench hook Used in conjunction with a vice to cut materials, usually wood (2 × [1])	[2]
	(d) Round head pliers Used to remove nails, staples etc Others considered (2 × [1])	[2]
	(e) Mallet Used with a chisel to create wood joints (2 × [1])	[2] 10
3	(a) Computer Integrated Manufacturing	[1]
	(b) CNC Router CNC Mill CNC robotic welder Others considered (2 × [1])	[2]
	(c) Accuracy, consistent finish Others considered Disadvantage: High set-up cost Others considered	[2] 7

		AVAILABLE MARKS
4	(a) Modern materials are items developed through the invention of new or improved processes, for example as a result of 'man' made materials/ ingredients or human intervention. Others considered	[2]
	(b) Example: Carbon fibre Use: Bicycle frame	[1] [1]
	Example: Titanium Use: Golf driver	[1] [1]
	Others accepted	6
5	(a) Appropriate product stated (i) Appropriate reference to safety with particular reference to the product stated.	[2]
	(ii) Appropriate reference to efficiency of modern methods of production with particular reference to the product stated.	[2]
	(b) Quicker lead times Others considered	[2]
	(c) Staff need retrained as to how to use the new equipment. Others considered	[2]
		8
6	(a) 1. Stock control, customer can review it before dispatch 2. Designs can be emailed remotely for manufacture. Others similar answers accepted. (2 × [2])	[4]
	(b) 1. Real time correspondence teleconference calls. 2. Quicker correspondence between each production stage. Others considered (2 × [2])	[4]
	(c) 1. Mobile telephone 2. Fax machine Others considered (1 × [2])	[2]
		10
7	(a) 1. Can work 24/7 2. Can operate in dangerous environments. Others considered (2 × [2])	[4]
	(b) 1. If the robotic production line breaks down in a specific area it can stall the whole production line. 2. Staff will need trained in how to use and operate the equipment. Others considered (2 × [2])	[4]
		8

		AVAILABLE MARKS
8	(a) Steel, brass, stainless steel Others considered	[1]
	(b) 1. Mark out the size of the hinge on the wood using a try square. 2. Chisel out the wood using a chisel and a mallet. 3. Fit the hinge. 4. Create pilot hole for the screws, and screw the screws in place. Various variations are also accepted. (4 × [1])	[4]
	(c) 1. Very accurate, precise, 2. Much quicker Others accepted (2 × [2])	[4] 9
9	(a) Manufacturing stages arranged appropriately. (4 × [1])	[4]
	(b) So that the production run goes smoothly.	[2]
	(c) Appropriate stage listed with appropriate impact	[2] 8
10	(a) It is not biodegradable Fills up landfill sites Waste of resources Toxic fumes Global warming Others considered	[5]
	(b) Less waste The development of environmentally friendly materials Energy efficient appliances More recycle materials Less gas emissions Use of wind and solar Others considered	[5] 10
	Total	80