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Rewarding Learning

**General Certificate of Secondary Education
2013**

Manufacturing

Paper 1

Assessment Unit 3

assessing

Manufacturing Technology

[GMA31]

WEDNESDAY 19 JUNE, MORNING

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 ocf 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.

1 **(a)** Bleach
Petrol can
(2 × [1])   [2]

(b) Metal garden swing
Electricity pylon
(2 × [1])   [2]   4

2 Used for cutting and shaping wood
Forstner Bit   must state "Forstner"
Flat File – Shaping and smoothing material
Bench Plane – Shaving thin layers of material accept wood plane
Brace – making holes
Bradawl – Making holes
(6 × [1])   [6]   6

3 **(a)** Use a laser cutter
Have a template
Others considered   [2]

(b) Use a mould/Jig
Others considered   [2]

(c) **(i)** So that products are not returned
To ensure that the dimensions of the product are correct to hold a
mobile phone
(2 × [2])   [4]

(ii) Check the angles of the bends on the acrylic
Check the dimensions
Others considered   [1]   9

4 **(a)** To reproduce identical products continually
Others considered   [2]

(b) High output of products
Consistency with regard to production
(2 × [2])   [4]

(c) Designs can be modified easily
Mistakes can be identified easily
Others considered
(2 × [2])   [4]   10

5 **(a)** To ensure all materials are in stock before manufacturing a product
To ensure a smooth transition from stage to stage
Others considered
(2 × [2]) [4]

(b) Products are not manufactured on time
Suppliers will not be happy with the manufacturer's service
Others considered
(2 × [2]) [4]

(c) Mistakes noticed at the last minute
Delay in the delivery of materials
Others considered
(2 × [2]) [4]　　12

6 **(a)** **(i)** The use of robotics in dangerous situations
Others considered [2]

(ii) Reduced lead times, CAM has enabled efficient production methods
Others considered [2]

(b) Reduced number of staff required
Products produced much faster with no mistakes
Accuracy of manufactured products
Others considered
(2 × [2]) [4]

(c) Automated production line
Others considered [1]　　9

7 **(a)** Welding
Drilling
Others considered [2]

(b) Movement of products within a factory
Assembly and dispatch of products
Others considered
(2 × [2]) [4]

(c) Malfunctions can stop production
Others considered [2]　　8

8 **(a)** Appropriate product identified [1]

(b) Appropriate description of the modern technology used [2]

(c) Appropriate explanation of how the modern technology is of benefit in
the use of this product [2]　　5

			AVAILABLE MARKS
9	**(a)**	Smart materials are materials which change their properties in response to changes in their environment Others considered [2]	
	(b)	Nitinol Others considered [1]	
	(c)	Frames for glasses Others considered [2]	
	(d)	Keeping up with competitors Product development Others considered [2]	7
10	**(a)**	Team roles – Everyone must have a specific role to ensure that they know exactly what is required of them and that they know exactly what to do Others considered [2] Responsibilities within a team – To ensure that what is required of the team is being met Others considered [2] Team targets – So that everyone has the same goal. To enthuse team members Others considered [2]	
	(b)	Staff need retrained to use the new technology Less staff required Others considered (2 × [2]) [4]	10
		Total	**80**