Rewarding Learning

General Certificate of Secondary Education
2015

Manufacturing

Paper 2

Assessment Unit 3

assessing

Manufacturing Technology

[GMA32]

FRIDAY 19 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.

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
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 candidate's 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 candidate's 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 candidate's 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)** **(i)** Computer Integrated Manufacture [1]

(ii) All materials are in stock to maintain speed of production; speed of production can be increased or decreased depending on orders/demand. Other answers considered [2]

(b) **(i)** Advantage: Plywood provides more rigidity and strength; more weatherproof; less harmful dust from machining/wasting; harder and more durable. Other answers considered [1]

Disadvantage: More expensive, edges are as effective when shaping as curves; can cause splinters when damaged. Other answers considered. [1]

(ii) Sheet/Boards. [1]

(c) All products are verified and consistently safe to use.
Good reputation for the manufacturer.
Other answers considered

Raises the profile of the product.
(2 × [1]) [2]

(d) **(i)** Any **two** from – ability to view a 3D model prior to manufacture; email designs; CAM used to produce consistently accurate products; CIM to manage stock levels etc; CIM to process orders.
(2 × [1]) [2]

(ii) High set-up costs; staff need to be trained to use the equipment.
Constant hardware and software updates. [1]
Other answers considered

(e) **(i)** Traditional methods: bandsaw; scroll saw; router; circular saw.
Modern method: CAM; CNC machine; CNC router; laser cut.
(2 × [1]) other answers considered [2]

(ii) Advantage: Faster production; more accurate production; more consistency in products; greater potential for mass production.
Information can be sent via email. [1]

Disadvantage: Lead to unemployment; training costs; initial set-up costs. If there is a power cut, unsecured work can be lost. [1]
Other answers considered

(f) **(i)** Comfort; ergonomics; can be moulded easily to fit the handlebar. [1]
Other answers considered

(ii) Lightweight, easy to shape, doesn't rust.
Good strength to weight ratio. [1]
Other answers considered

(iii) ABS; mild steel; aluminium; oak; beech; ash. [1]
Other answers considered

			AVAILABLE MARKS
(g)	**(i)**	Handlebar grips; saddle; wheel rims; wheels; nuts and bolts. [1] Other answers considered	
	(ii)	Machinery required to manufacture is not available; not economically viable/cost effective; cost. [1] Other answers considered	
(h)		Appropriate diagrams explaining the press forming process. Marks will be awarded for: – Detail contained in sketches [4] – Quality of sketches [3] – Detailed notes [3] [10]	
	(i)	Appropriate diagrams explaining how the seat is attached to the seat post. Detail should include the method of joining. Diagrams should also include how the foam padding is held in place as well as how the covering is secured. Marks will be awarded for: – Detail contained in sketches [4] – Quality of sketches [3] – Detailed notes [3] [10]	40
		All other alternative responses for questions will be considered.	
		Total	**40**