Rewarding Learning

General Certificate of Secondary Education
2012

Technology and Design

Unit 3: Production Design

[GTD31]

TUESDAY 29 MAY, 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. The mark schemes should be read in conjunction with these general marking instructions.

Assessment objectives
Below are the assessment objectives for GCSE Technology and Design.

Students must:
- recall select and communicate their knowledge and understanding of technology and design in a range of contexts (AO1);
- apply skills, knowledge and understanding, in a variety of contexts and in designing and making products (AO2); and
- analyse and evaluate products, including their design and production (AO3).

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 an unanticipated answer, 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 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 very good.

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

Level 1 (Limited): The level of accuracy of presentation, spelling, punctuation and grammar 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 presentation, spelling, punctuation and grammar 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 (Very Good): The level of accuracy of presentation, spelling, punctuation and grammar is very good. 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 very good. There is very good use of appropriate specialist vocabulary.

				AVAILABLE MARKS
1	(a)	(i)	BSI Kitemark/British Standard [1]	
		(ii)	European CE mark [1]	
		(iii)	[1] or [2] awarded if a product meets a given safety standard **and** a manufacture has a quality system in place to ensure that every product is made to the same standard [2]	
	(b)		**Main features of just-in-time manufacturing** • Manufacture goods when required or ordered (Making to order) • Integration of all processes in the production cycle • A computer controlled/integrated system that schedules all operations • Buy in raw material for manufacturing goods just before/only when needed • It is a continuous operation 3 × [1] [3]	
			Advantage • Capital not tied up in holding excessive stock • Elimination of waste • Reduces warehouse space/requirements • One suitable answer [1]	8

2 **(a)** To plan and manage the production of products/timescale [1]

(b) Sample solution

Time (minutes)

Sequence	10	20	30	40	50	60	70	80	90	100
Mark out shape to be cut	■	■								
Centre punch and drill 5 mm hole			■							
Cut Metal to Shape				■	■	■				
File and finish edges							■	■		
Dip Coat									■	■

Chart showing five suitable procedures in an appropriate sequence with progressive time shaded or marked.
First and last plus three others 5 × [1] [5]

(c) Protection against rusting/attractive finish/add colour to key fob, etc. [2]

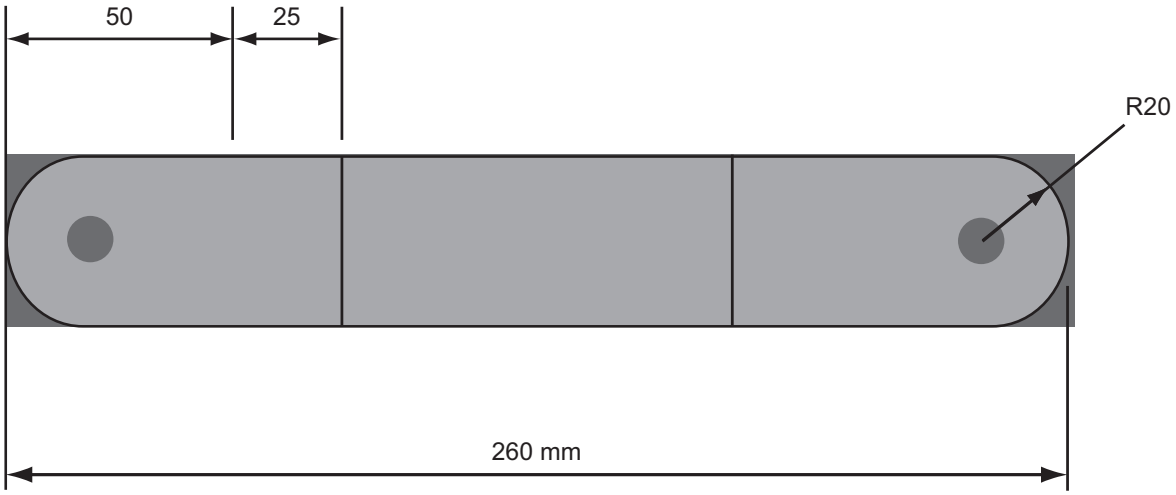
AVAILABLE MARKS

8

AVAILABLE MARKS

3 **(a)**
- Drilling Machine
- Jig or former
- Strip Heater or Oven
- Scroll saw or Band Facer

any three 3 × [1] [3]



(b) Correct dimensions as shown 3 × [1] [3]

(c) Batch production is the manufacturing technique of fixed a number of components or products. Generally based on a single order.

Mass production is continuous manufacturing process producing very large volumes of components or products

1 × [2] [2] 8

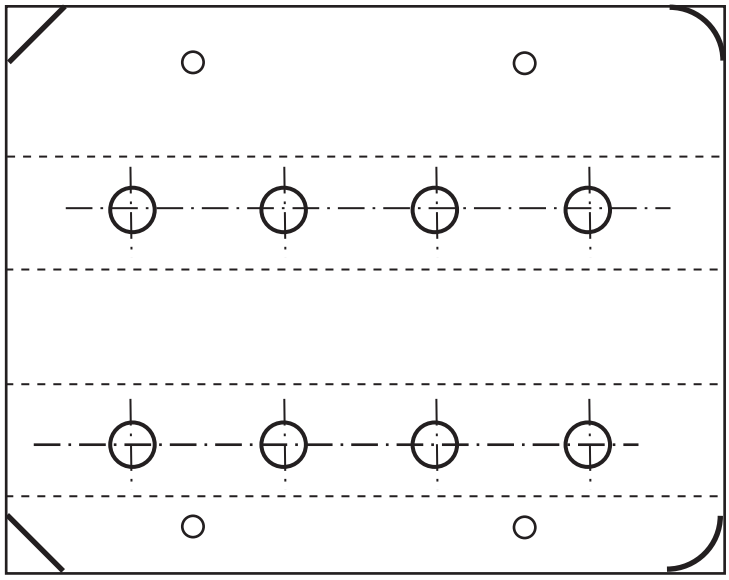
				AVAILABLE MARKS
4	**(a)**	Sink Stainless steel [1] Reason Does not rust or corrode [1]	[2]	
	(b)	• Height of workshop • Height of cupboards • Width of worktop, etc. • Position of handles on cupboard doors 2 × [1]	[2]	
	(c)	**(i)** Recycling Processing used materials into new products	[2]	
		(ii) • Saving resources • Saving energy • Reduce dumping, etc. 2 × [1]	[2]	8

					AVAILABLE MARKS
5	**(a)**	Plasticity: the ability to be shaped or formed (hot or cold). [1]			
		Application: Bending copper pipes, using a line bender, etc. [1]		[2]	
	(b)	**(i)**	A Bending		
			B Tension		
			C Compression		
			D Shear	[4]	
		(ii)	I section	[1]	
			Sketch	[1]	8

			AVAILABLE MARKS
6	(a)	• Loft insulation • Cavity wall insulation • Double Glazing 3 × [1] [3]	
	(b)	• The sustainability of resources • Limited supply of fossil fuels • Negative effects of pollution caused by exhaust emissions 2 × [1] [2]	
	(c)	• The general inertia of people to change from quality cars has resulted in little public interest • Poor perceived image of battery operated cars as slow in speed • Short travel distance between battery charges • Very silent in use, may cause accidents to pedestrians • Limited charging depots, therefore limited travel • Long stops because of recharging time 3 × [1] [3]	8

			AVAILABLE MARKS
7	**(a)**	Easy to bend; good weight to strength ratio; doesn't rust; polished well; soft and ductile: 2 × [1] [2]	
	(b) **(i)**	Metal folding; metal pressing [1]	
	(ii)	Placing and removing tools would chip the paint [1]	
	(c) **(i)**	To remove sharp corners; to make the corners safe to the user [2]	
	(ii)	Radius or angle cut or any other suitable method drawn in each corner (same for each corner) [2]	8

e.g.



		AVAILABLE MARKS
8	Using annotated sketch(es), design a contemporary compact disc (CD) holder to hold 10 CDs in their cases. The design must satisfy the following specification points:	
	• Be aesthetically pleasing [4]	
	• Make efficient use of material(s) [4]	
	• Must be freestanding and stable [4]	
	• Allow easy selection and readability of each CD [4]	
	• Clear dimensioned solution [4]	
	• Identification and justification of appropriate material(s) and manufacturing techniques for your solution [4]	
	The solution should include all necessary dimensions and stated material(s).	
	The answer to each specification point should be holistically marked.	24
	Total	**80**