



Rewarding Learning

**General Certificate of Secondary Education
2025**

Technology and Design

Unit 1: Technology and
Design Core Content

[GTY11]

THURSDAY 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.

Candidates must:

- AO1** Recall, select and communicate their knowledge and understanding of Technology and Design in a range of contexts;
- AO2** Apply skills knowledge and understanding, including quality standards in a variety of design contexts. Plan and carry out investigations and making tasks involving an appropriate range of tools, equipment, materials and processes; and
- AO3** Analyse and evaluate evidence, design proposals and outcomes, make reasoned judgements and present conclusions and recommendations.

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 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.

Level 1: Response which merits inclusion in the band and should be awarded the lower mark.
Level 2: Response which merits inclusion in the band and should be awarded the higher mark.

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:

- Band 1: Quality of written communication is basic.
- Band 2: Quality of written communication is limited.
- Band 3: Quality of written communication is satisfactory.
- Band 4: Quality of written communication is good.
- Band 5: Quality of written communication is excellent.

In interpreting these level descriptions, examiners should refer to the more detailed guidance provided in the relevant question in the mark scheme.

1 (a) Transistor/NPN transistor

[1]



[1]

Hazard

[1]

Explosive

[1]

Emergency eyewash

[1]

Mechanical

[1]

Sprocket and chain

[1] [7]

(b)



[1]

(c) X = base [1], Y = collector [1], Z = emitter [1]

[3]

11

2 (a) (i) Computer-aided design

[1]

(ii) Any **one** from:

To visualise the design from a range of views

To model/test the viability of the ideas

[1]

All relevant, valid responses will be given credit

(b) (i) Any **one** from:

Acrylic/PVC/rigid polystyrene/ABS/nylon

[1]

All relevant, valid responses will be given credit

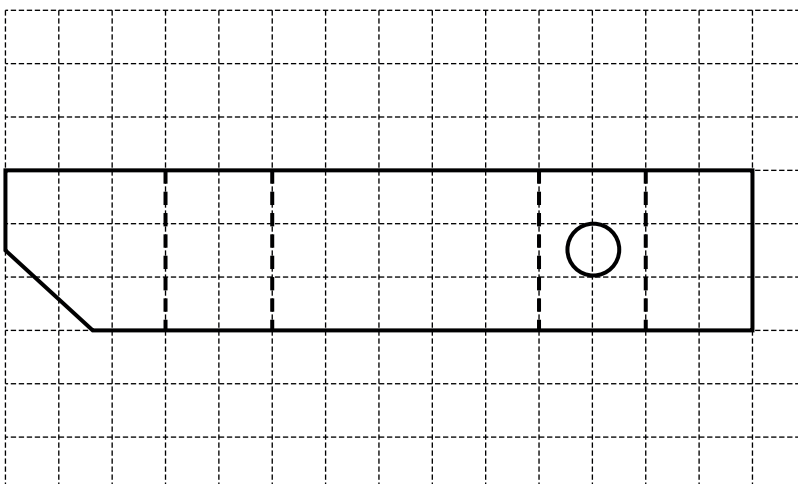
(ii) Line bender/strip heater

[1]

Jig

[1] [2]

(c)



Correct length

[1]

Correct width

[1]

Correct hole diameter

[1]

Correct position of hole

[1]

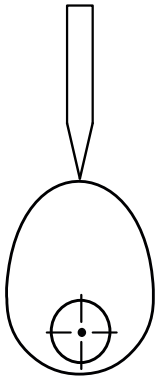
Correct taper

[1] [5]

10

- 3 (a) X: Pear-shaped [1] cam [1] [2]
 Y: Knife [1] follower [1]. [2] [4]
- (b) X: To provide input [1] in the form of rotary motion [1]. [2]
 Y: to provide output [1] in the form of reciprocating motion [1]. [2] [4]

(c)



[2] 10

- 4 (a) 3/2 Valve [1]
 Pipeline not connected [1]
 Pressure source [1]
 Exhaust [1] [4]
- (b) (i) Shuttle valve [1]
 (ii) When the circuit is to be operated from two different sources. [1]
 (iii) Single acting cylinder or (SAC) [1] 7

- 5 (a) Tenon saw:
 Used for cutting straight [1] lines in wood [1]. [2]
- Coping saw:
 Used for cutting curved lines/shapes [1] in wood/plastic [1]. [2]
- Sliding bevel:
 Used for marking out [1] a line at a specific angle [1]. [2] [6]

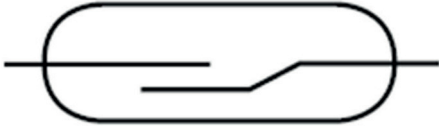
(b)

Joining Method	Permanent	Semi-permanent
Knock-down fittings		✓
Soft soldering	✓	
Countersunk woodscrews		✓
Dowel joint	✓	
Riveting	✓	

([1] × 5) [5] 11

- 6 (a) (i) LDR/light dependent resistor. [1]
- (ii) The resistance of component D increases as the light level decreases. [1] This will cause the output voltage from the potential divider to increase [1] to a point where component F is switched on allowing current to flow through the buzzer. [1] [3]
- (iii) Component C can be used to adjust [1] the threshold at which the circuit operates. [1] [2]

(b) (i)



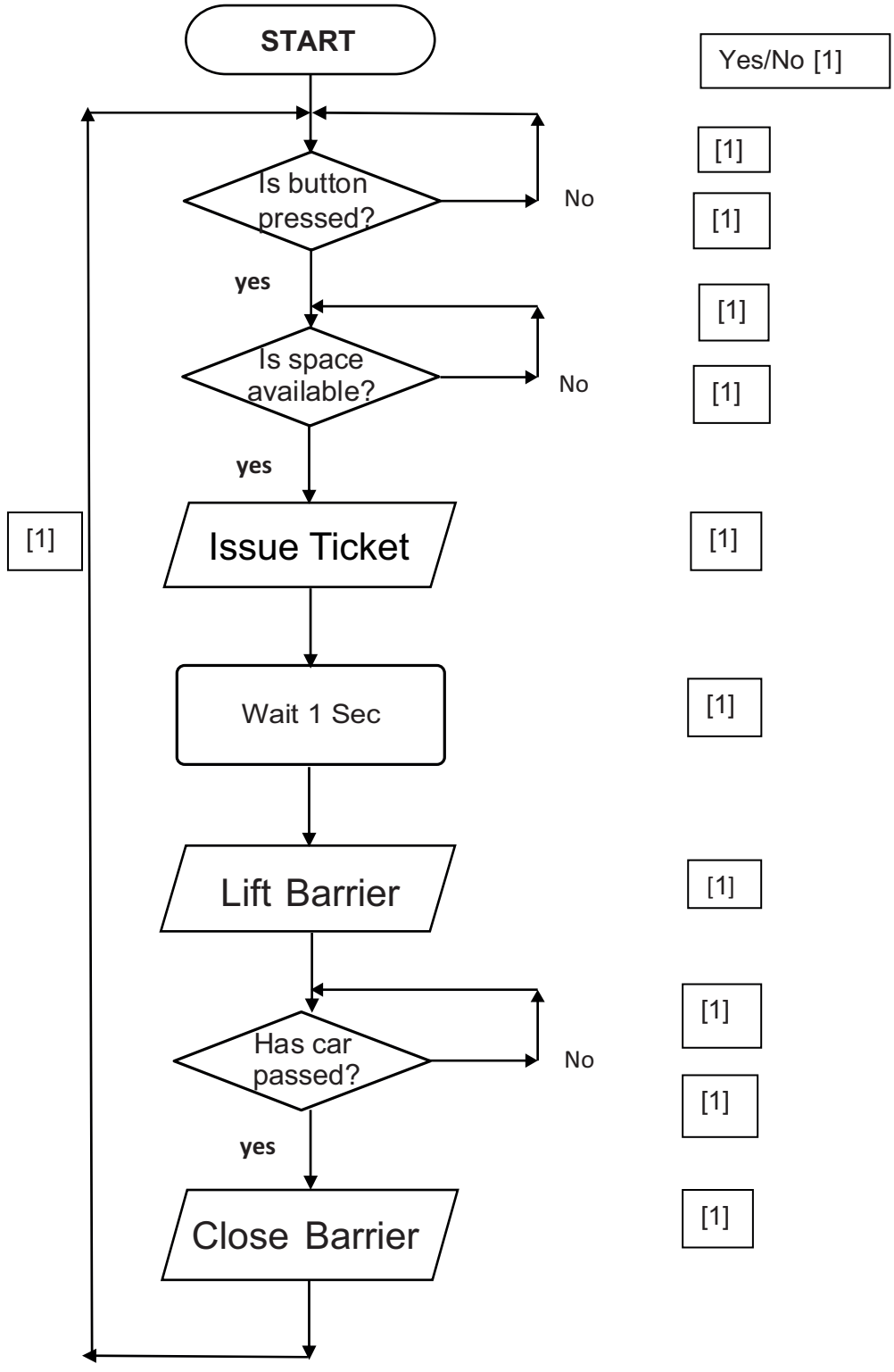
Glass [1] contacts [1] [2]

- (ii) The reed switch is activated by proximity to a magnet [1] which causes a connection between the terminals inside the switch. [1] [2]
- applications: alarm circuits, position sensors in machinery. [1] [3]

All relevant, valid responses will be given credit

AVAILABLE
MARKS

11



[1]

Yes/No [1]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

AVAILABLE MARKS

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8 (a) An alloy is a mixture [1] of two or more elements one of which must be a metal [1]. [2]

(b)

	Ferrous	Non-ferrous	Alloy
Stainless steel	✓		✓
Copper		✓	
Brass		✓	✓
Mild Steel	✓		✓
Aluminium		✓	

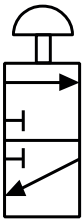
Award [1] for each row completed correctly (1 × [5]) [5]

(c) (i) Mild Steel [1]

(ii) Protects mild steel from corrosion [1]

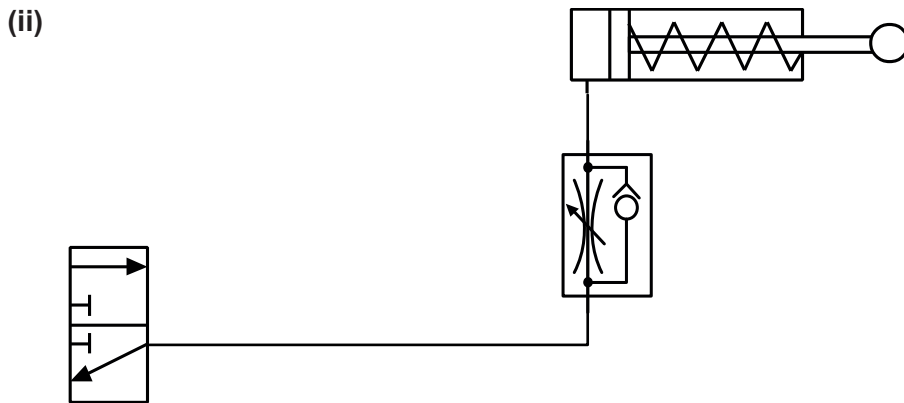
9 (a) (i) Push button, Roller trip, Plunger, Lever Any two (2 × [1]) [2]

(ii) Correct symbol [1] in correct location [1]



[2]

(b) (i) Unidirectional flow regulator/restrictor [1]



Component inserted in the circuit [1]
 Correct orientation to achieve desired outcome [1] [2]

(iii) The valve must be connected in the correct orientation [1] so that the outstroke speed is controlled. The screw on the valve is adjusted [1] to control the outstroke speed. [2]

9

9

10 Indicative Content:

- A well prepared mould is necessary for a successful casing.
- All blemishes/imperfections must be removed from the mould otherwise they will be transferred to the casing.
- The mould needs to avoid sharp corners otherwise it will be difficult to remove after forming.
- The mould must have appropriate draft angles/tapers to aid removal.
- A polished finish is needed/releasing agent applied to aid removal of mould.
- Insert the mould into the vacuum former.
- Lower the platform and mould in the machine.
- Select an appropriate sheet of thermoplastic.
- Clamp the plastic sheet into the machine.
- Switch on heater.
- Pull/slide the heater over the plastic.
- Constantly check the heating process.
- When the plastic sheet is soft (165/175°C) push/slide the heater back.
- Raise the mould/platform up into the plastic sheet.
- Turn on the vacuum pump.
- If the plastic sheet is soft enough it will form around the mould.
- Turn off vacuum pump and lower the platform.
- Blow air to aid releasing.
- Release clamps and allow plastic to cool.
- Remove the plastic and mould from vacuum former.
- Remove the vacuum formed product from the mould.
- Remove/trim the excess plastic material from the vacuum formed product.

Safety Precautions:

- Be aware of the heater element in vacuum former.
- Handle hot plastic with care/wear gloves.
- Wear goggles when required.
- Hair tied back if required.
- Wear an apron/ensure there is no loose clothing.
- Exercise care when cutting waste plastic.
- Switch off vacuum former after use.
- Wash hands after using the machines.

AVAILABLE
MARKS

Response Type	Description	Mark
Basic 1–2	Student responds by completely missing the focus of the question. This response may or may not be well written.	1
	Student response contains little content. It may name some of the safety precautions and some stages/steps in the process. The response lacks clarity and coherence and is poorly organised. The level of written communication is basic.	2
Limited 3–4	Student describes very few stages/steps in the vacuum forming process and may or may not make reference to the mould and/or the removal of surplus material. Some safety precautions are given/listed but tend to be general rather than specific to the process. The level of written communication is limited but conveys some information. It is limited in technical vocabulary and specialist terms. Spelling, punctuation and grammar lack accuracy.	3
	Student describes very few stages/steps in the vacuum forming process and makes some reference to the mould, and/or the removal of surplus material. Some safety precautions specific to the process are given/listed. The level of written communication conveys some information. It lacks technical vocabulary and specialist terms. Spelling, punctuation and grammar lack accuracy.	4
Satisfactory 5–6	Student describes some of the stages in the vacuum forming process and makes some reference to the preparation of the mould and the removal of surplus material. Some safety precautions have been discussed. The level of written communication is satisfactory and contains some technical vocabulary and specialist terms. The accuracy of spelling, punctuation and grammar is satisfactory.	5
	Student describes some of the stages in the vacuum forming process and makes some reference to the preparation of the mould and the removal of surplus material. Some appropriate safety precautions are discussed or described at relevant stages throughout the answer. The level of written communication is very satisfactory and contains some technical vocabulary and specialist terms. The accuracy of spelling, punctuation and grammar is very satisfactory.	6

**AVAILABLE
MARKS**

Good 7–8	Student correctly describes most or all of the stages in the vacuum forming process and makes good reference to the preparation of the mould and the removal of surplus material. Most safety precautions are referred to throughout the answer. The level of written communication, technical vocabulary and specialist terms is generally good. The accuracy of spelling, punctuation and grammar is good.	7
	Student correctly describes most or all of the stages in the vacuum forming process and makes very good reference to the preparation of the mould, and the removal of surplus material. Most safety precautions are referred to throughout the answer. The response is well organised clear and coherent. The level of written communication, technical vocabulary and specialist terms is very good throughout. The accuracy of spelling, punctuation and grammar is very good.	8
Excellent 9–10	Student correctly describes most or all of the stages in the vacuum forming process and makes excellent reference to the preparation of the mould and the removal of surplus material. Most safety precautions are referred to throughout the answer. The level of written communication, technical vocabulary and specialist terms is excellent. The accuracy of spelling, punctuation and grammar is excellent.	9
	Student correctly describes all of the stages required in the vacuum forming process and makes excellent reference to the preparation of the mould and the removal of surplus material. All relevant safety precautions associated with the process have been discussed at appropriate points throughout the answer. The level of written communication, technical vocabulary and specialist terms is excellent. The accuracy of spelling, punctuation and grammar is excellent.	10
When a response is not worthy of credit, a [0] mark should be awarded.		

[10]

Total

AVAILABLE MARKS
10
100