



Rewarding Learning

**General Certificate of Secondary Education
2025**

Engineering and Manufacturing

Unit 2

assessing

Production

[GEM21]

TUESDAY 6 MAY, 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 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 GCSE Engineering and Manufacturing.

Candidates must:

- AO1** Recall, select and communicate their knowledge and understanding of engineering and manufacturing 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 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.

Part 1 – Steel part.

1 2 off 8 mm hole locations.

(i) Hole locations.

Holes correctly located within a tolerance of +/- 0.5 mm. [2 × 2]
Holes correctly located within a tolerance of +/- 1.5 mm. [2 × 1]
If outside tolerance of +/- 1.5 mm. [0]
(2 × [2])

[4]

(ii) 8 mm hole diameters.

Hole diameters 8 mm. [1]
Hole diameters incorrect. [0]
(1 × [1])

[1]

2 off 4 mm hole locations.

(iii) Hole locations.

Holes correctly located within a tolerance of +/- 0.5 mm. [2 × 2]
Holes correctly located within a tolerance of +/- 1.5 mm. [2 × 1]
If outside tolerance of +/- 1.5 mm. [0]
(2 × [2])

[4]

(iv) 4 mm hole diameters.

Hole diameters 4 mm. [1]
Hole diameters incorrect. [0]
(1 × [1])

[1]

**AVAILABLE
MARKS**

10

		AVAILABLE MARKS
2 (i) Linear dimension (75 mm).	Within a tolerance of +/- 0.5 mm. [1 × 3] Within a tolerance of +/- 1 mm. [1 × 2] Within a tolerance of +/- 1.5 mm. [1 × 1] Outside a tolerance of +/- 1.5 mm. [0] (1 × [3])	[3]
(ii) Top Linear dimension (45 mm).	Within a tolerance of +/- 0.5 mm. [1 × 3] Within a tolerance of +/- 1 mm. [1 × 2] Within a tolerance of +/- 1.5 mm. [1 × 1] Outside a tolerance of +/- 1.5 mm. [0] (1 × [3])	[3]
3 Linear dimension (9 mm) 4 off (measured in two places).	Within a tolerance of +/- 0.5 mm. [4 × 3] Within a tolerance of +/- 1 mm. [4 × 2] Within a tolerance of +/- 1.5 mm. [4 × 1] Outside a tolerance of +/- 1.5 mm. [0] (4 × [3])	[12]
4 (i) Linear dimension (8 mm) 2 off (measured in two places).	Within a tolerance of +/- 0.5 mm. [2 × 3] Within a tolerance of +/- 1 mm. [2 × 2] Within a tolerance of +/- 1.5 mm. [2 × 1] Outside a tolerance of +/- 1.5 mm. [0] (2 × [3])	[6]
(ii) Linear dimension (32 mm).	Within a tolerance of +/- 0.5 mm. [2 × 3] Within a tolerance of +/- 1 mm. [2 × 2] Within a tolerance of +/- 1.5 mm. [2 × 1] Outside a tolerance of +/- 1.5 mm. [0] (2 × [3])	[6]
		6
		12
		12

5 Radius on steel part (25 mm radius)

- Radius completed to a high degree of precision. [1 × 3]
 - Radius completed to a satisfactory degree of precision. [1 × 2]
 - Radius completed to a poor degree of precision. [1 × 1]
 - Radius not present. [0]
- (1 × [3]) [3]

**AVAILABLE
MARKS**

3

6 Quality of finish

(i) Finish on edges.

- Good quality finish on all of the edges. [3]
 - Satisfactory finish but with some saw and cross filing marks on the edges. [2]
 - Some evidence of finishing on some of the edges. [1]
 - No evidence of finishing. [0]
- (1 × [3]) [3]

(ii) Finish on faces.

- Good quality finish on all of the faces. [3]
 - Satisfactory finish but with some sharp edges on holes or on the faces. [2]
 - Some evidence of finishing on some of the holes and faces. [1]
 - No evidence of finishing. [0]
- (1 × [3]) [3]

6

Part 2 – Acrylic part.

7 2 off 8 mm hole locations.

(i) Hole locations.

Holes correctly located within a tolerance of +/- 0.5 mm. [2 × 2]

Holes correctly located within a tolerance of +/- 1.5 mm. [2 × 1]

If outside tolerance of +/- 1.5 mm. [0]

(2 × [2])

[4]

(ii) 8 mm hole diameters.

Hole diameters 8 mm. [1]

Hole diameters incorrect. [0]

(1 × [1])

[1]

3 off 4 mm hole locations.

(iii) Hole locations.

Holes correctly located within a tolerance of +/- 0.5 mm. [3 × 2]

Holes correctly located within a tolerance of +/- 1.5 mm. [3 × 1]

If outside tolerance of +/- 1.5 mm. [0]

(3 × [2])

[6]

(iv) 4 mm hole diameters.

Hole diameters 4 mm. [1]

Hole diameters incorrect. [0]

(1 × [1])

[1]

12

8 (i) Linear dimension (11 mm) 2 off (measured in two places).

Within a tolerance of +/- 0.5 mm. [2 × 3]

Within a tolerance of +/- 1 mm. [2 × 2]

Within a tolerance of +/- 1.5 mm. [2 × 1]

Outside a tolerance of +/- 1.5 mm. [0]

(2 × [3])

[6]

(ii) Linear dimension (8 mm) 2 off (measured in two places).

Within a tolerance of +/- 0.5 mm. [2 × 3]

Within a tolerance of +/- 1 mm. [2 × 2]

Within a tolerance of +/- 1.5 mm. [2 × 1]

Outside a tolerance of +/- 1.5 mm. [0]

(2 × [3])

[6]

12

**AVAILABLE
MARKS**

		AVAILABLE MARKS
<p>9 (i) Linear dimension (100 mm) 2 off. Within a tolerance of +/- 0.5 mm. [2 × 3] Within a tolerance of +/- 1 mm. [2 × 2] Within a tolerance of +/- 1.5 mm. [2 × 1] Outside a tolerance of +/- 1.5 mm. [0] (2 × [3])</p>	[6]	
<p>(ii) Linear dimension (75 mm) 2 off. Within a tolerance of +/- 0.5 mm. [2 × 3] Within a tolerance of +/- 1 mm. [2 × 2] Within a tolerance of +/- 1.5 mm. [2 × 1] Outside a tolerance of +/- 1.5 mm. [0] (2 × [3])</p>	[6]	
<p>(iii) Linear dimension (50 mm) 2 off. Within a tolerance of +/- 0.5 mm. [2 × 3] Within a tolerance of +/- 1 mm. [2 × 2] Within a tolerance of +/- 1.5 mm. [2 × 1] Outside a tolerance of +/- 1.5 mm. [0] (2 × [3])</p>	[6]	
<p>(iv) Linear dimension (25 mm) 2 off. Within a tolerance of +/- 0.5 mm. [2 × 3] Within a tolerance of +/- 1 mm. [2 × 2] Within a tolerance of +/- 1.5 mm. [2 × 1] Outside a tolerance of +/- 1.5 mm. [0] (2 × [3])</p>	[6]	24
<p>10 Quality of finish</p> <p>Finish on edges.</p> <p>Good quality finish on all of the edges. [3] Satisfactory finish but with some saw and cross filing marks on the edges. [2] Some evidence of finishing on some of the edges. [1] No evidence of finishing. [0] (1 × [3])</p>	[3]	3
Total		100