



Cambridge IGCSE™

DESIGN AND TECHNOLOGY

0445/12

Paper 1 Product Design

May/June 2020

MARK SCHEME

Maximum Mark: 50

Published

Students did not sit exam papers in the June 2020 series due to the Covid-19 global pandemic.

This mark scheme is published to support teachers and students and should be read together with the question paper. It shows the requirements of the exam. The answer column of the mark scheme shows the proposed basis on which Examiners would award marks for this exam. Where appropriate, this column also provides the most likely acceptable alternative responses expected from students. Examiners usually review the mark scheme after they have seen student responses and update the mark scheme if appropriate. In the June series, Examiners were unable to consider the acceptability of alternative responses, as there were no student responses to consider.

Mark schemes should usually be read together with the Principal Examiner Report for Teachers. However, because students did not sit exam papers, there is no Principal Examiner Report for Teachers for the June 2020 series.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the June 2020 series for most Cambridge IGCSE™ and Cambridge International A & AS Level components, and some Cambridge O Level components.

This document consists of 7 printed pages.

Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Performance description tables

Each question contains some marks which are awarded using the following performance description tables.

Communication of ideas

Mark	Performance description
5–6	Ideas are communicated with precision and clarity through the use of accurate drawings and reasoned annotations linked to most of the requirements.
3–4	Ideas are displayed with some clarity through clear drawings supported by annotations referring to some of the requirements.
1–2	Simple drawings and limited annotations show little understanding of the requirements.
0	No creditable response.

Suitable designs

Mark	Performance description
5–6	Designs showing most aspects of construction detail. Creative solutions which fully meet the requirements.
3–4	Designs with moderate construction detail. Sensible solutions that mostly meet the requirements.
1–2	Simplistic designs with little construction detail. Solutions do not meet many of the requirements.
0	No creditable response

Quality of drawing

Mark	Performance description
4	High standard of line quality, use of colour and proportions. Appropriate techniques used that show clearly all detail.
2–3	Good line quality, use of colour and proportions. Most of the detail presented.
1	Poor line quality and proportions. Little detail presented.
0	No creditable response.

Construction details

Mark	Performance Description
5–6	All construction detail clear with good annotations and/or additional detail drawings as necessary.
3–4	Most construction may be obvious from overall views or with some annotation.
1–2	A simplistic design; little or no detail of construction used.
0	No creditable response.

Guidance on using the performance description tables

Marking should be positive, rewarding achievement where possible but clearly differentiating across the whole range of marks available.

In approaching the assessment process, examiners should look at the work and then make a 'best fit' judgement as to which level statement it fits. In practice the work does not always match one level statement precisely so a judgement may need to be made between two or more level statements.

Once a 'best fit' level statement has been identified the following guide should be used to decide on a specific mark:

- Where the candidate's work **convincingly** meets the level statement, the highest mark should be awarded
- Where the candidate's work **adequately** meets the level statement, the most appropriate mark in the middle of the range should be awarded
- Where the candidate's work **just** meets the level statement, the lowest mark should be awarded.

Candidates answer **one** question, **either 1 or 2 or 3**.

Question	Answer	Marks
1(a)	Accept any four additional specification points – easy to see the details of the books, access to shelving system, method of fitting books onto shelves, security of books, stability of shelves, floor table or wall mounted, fit in with library décor/surroundings. [1 × 4]	4
1(b)	Accept any two methods – glass/plastic, elastic/wire retainer, fixed bar/dowel, pivoted bar. [2 × 2]	4
1(c)	Any three suitable ideas. Award up to 6 marks for communication of ideas using the ‘Communication of ideas’ table. Award up to 6 marks for suitable designs using the ‘Suitable designs’ table.	12
1(d)	Award up to 6 marks for evaluation of the ideas: Evaluation [2 × 3] e.g. Advantage + disadvantage explained for each idea Selection [1] Justification [1]	8
1(e)	Award up to 4 marks for quality of drawing using the ‘Quality of drawing’ table. Award up to 2 marks for dimensions : 2 or 3 overall dimensions only – 1 mark Additional detail dimensions – 1 mark Award up to 6 marks for construction detail using the ‘Construction details’ table.	12
1(f)	Accept any two suitable specific materials. [1 × 2] Accept any appropriate reason for choice of each material [1 × 2]	4
1(g)	Accept any suitable manufacturing process. [1 × 1]	1
	Award up to 3 marks for description of process .	3
	Award up to 2 marks for names of tools used .	2

Question	Answer	Marks
OR		
2(a)	Accept any four additional specification points – appealing/interesting to children, safe to use, will not fall over, eye catching, no sharp edges, fits in with library environment e.g. not noisy. [1 × 4]	4
2(b)	Accept drawings of any two methods – simple spinner, slider or origami-type movement, child pulls/moves some aspect of the display, activated by child looking at the display, electric motor, solar cell/battery powered, water/sand activated movement. [2 × 2]	4
2(c)	Any three suitable ideas. Award up to 6 marks for communication of ideas using the ‘Communication of ideas’ table. Award up to 6 marks for suitable designs using the ‘Suitable designs’ table.	12
2(d)	Award up to 6 marks for evaluation of the ideas: Evaluation [2 × 3] e.g. Advantage + disadvantage explained for each idea Selection [1] Justification [1]	8
2(e)	Award up to 4 marks for quality of drawing using the ‘Quality of drawing’ table. Award up to 2 marks for dimensions : 2 or 3 overall dimensions only – 1 mark Additional detail dimensions – 1 mark Award up to 6 marks for construction detail using the ‘Construction details’ table.	12
2(f)	Accept any two suitable specific materials. [1 × 2] Accept any appropriate reason for choice of each material [1 × 2]	4
2(g)	Accept any suitable manufacturing process. [1 × 1]	1
	Award up to 3 marks for description of process .	3
	Award up to 2 marks for names of tools used .	2

Question	Answer	Marks
OR		
3(a)	Accept any four additional specification points – easy to see the details of the books, safety of unit – stability/ hands trapped/cannot topple over, access to book stand, method of fitting books onto book stand, security of books, fit in with library décor/surroundings, source of rotation, mechanics involved e.g. gearing to reduce speed. [1 × 4]	4
3(b)	Accept drawings of any two methods of reducing the speed of a rotating shaft – gear box, electronic control of power source, belts and pulleys, weighted governor, torque advantage via use of gears. [2 × 2]	4
3(c)	Any three suitable ideas. Award up to 6 marks for communication of ideas using the ‘Communication of ideas’ table. Award up to 6 marks for suitable designs using the ‘Suitable designs’ table.	12
3(d)	Award up to 6 marks for evaluation of the ideas: Evaluation [2 × 3] e.g. Advantage + disadvantage explained for each idea Selection [1] Justification [1]	8
3(e)	Award up to 4 marks for quality of drawing using the ‘Quality of drawing’ table. Award up to 2 marks for dimensions : 2 or 3 overall dimensions only – 1 mark Additional detail dimensions – 1 mark Award up to 6 marks for construction detail using the ‘Construction details’ table.	12
3(f)	Accept any two suitable specific materials. [1 × 2] Accept any appropriate reason for choice of each material [1 × 2]	4
3(g)	Accept any suitable manufacturing process. [1 × 1]	1
	Award up to 3 marks for description of process .	3
	Award up to 2 marks for names of tools used .	2