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General Certificate of Secondary Education
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Design and Technology: Graphic Products 45501

(Specification 4550)

Unit 1: Written Paper

Final

Mark Scheme

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Section A

1 Designing - educational clock

1 (a) **Annotated ideas (2 x 5 marks):**

Excellent idea, moveable hands, manufacture (net size and explanation), assembly (detail of construction), stance and flat packed.	*4 – 5 marks*	
Satisfactory idea, considering some of the above points. May be made by a third party.	*2 – 3 marks*	
Weak idea, minor or no consideration of above points. Unable to be made by a third party.	*1 mark*	
Not attempted	*0 marks*	
		10 marks

Quality of sketching for both ideas (overall impression):

High level - good quality and effective	*3 marks*	
Medium level - adequate quality, with limit range	*2 marks*	
Low level - poor quality, difficult to interpret, inadequate communication	*1 mark*	
Not attempted - scribble	*0 marks*	
		3 marks

Creative solutions for both ideas (Theme originality):

High level - good quality and effective	*3 marks*	
Medium level – Some variety of ideas. Maximum of 2 marks for idea	*2 marks*	
Low level – simple basic design, similar ideas	*1 mark*	
Not attempted - scribble	*0 marks*	
		3 marks

Quality of notes with reference to constructional details: Read annotation to gain this mark

Clear understanding constructional read annotation to gain this mark	*2 marks*	
Some reference to constructional details, labels only	*1 mark*	
Incorrect or not attempted	*0 marks*	
		2 marks

1 (b) (i) **Must show progression – not a third idea**

High level - clear progressive development of all aspects, very appealing to primary school pupils	*5 marks*
Good development of most aspects, appealing.	*4 marks*
Medium level - attempt at development of main features but may not appeal to primary school children	*3 marks*
Minor development	*2 marks*
Low level - no development, one idea only	*1 mark*
Not attempted	*0 marks*

5 marks

1 (b) (ii) Accept click fasteners, Velcro, split pins, paper fasteners and eyelets

High level - good quality and effective method	*3 marks*
Medium level - adequate quality, some omissions	*2 marks*
Low level - poor quality, difficult to interpret, inadequate communication	*1 mark*
Not attempted - scribble	*0 marks*

3 marks

1 (c)

High level - good quality, in proportion, crating, line work etc. Includes the surface decoration to a good standard.	*5 – 6 marks*
Medium level - adequate quality, recognisable, some inaccuracy. Max of 3 marks if no surface decoration	*3 – 4 marks*
Low level - poor, difficult to interpret, confused.	*1 – 2 marks*
Not attempted	*0 marks*

Max 3 marks for 3D drawing not assembled
Max 2 marks for 2D drawing with surface decoration
Max 1 mark for 2D drawing
Not attempted

6 marks

1 (d) Evaluation – as a teaching aid-robust, clarity, flat packed, ease of assembly, appealing etc

High level - analytical/critical/modification	*3 marks*
Medium level – some reasoning	*2 marks*
Low level - mainly self congratulation e.g. good	*1 mark*
No attempt or not relevant, or simply describing drawing, repeat	*0 marks*

3 marks

35 marks

Section B

2 Scale of production

2 (a) L plate Design requirements. *3 x 1 mark*

- Easily visible, colour, font
- Recognisable
- Simple design-minimal components
- Economical to manufacture
- Meet DSA regulations
- Weather conditions
- Nor damage paint
- Must stay on at high speed

3 marks

2 (b) Batch production:

Normally involves a factory making the same item only for a few days or for up to a few months. Adaptable process so quite easy to change-flexible organisation. Batch production uses machine tools for a particular product run, the machine tools can be then set up for the next product. The tools are adaptable and multi-use rather than dedicated to one product.

e.g. books, business cards etc must be a Graphic Product

High level - clear and concise, including an example	*3 marks*
Medium level - some understanding, possible no example	*2 marks*
Low level - poor understanding	*1 mark*
No understanding or not attempted	*0 marks*

3 marks

2 (c) (i) Flexography *2 marks*
Screen printing *1 mark*

2 marks

2 (c) (ii) Quality Control e.g. random sampling 1 -100, visual checks for colour and alignment, materials etc, tolerance tests.

Well explained and reasoned	*2 marks*
Some understanding	*1 mark*
No understanding or not attempted	*0 marks*

2 marks

2 (d) (i) Smart material e.g. a material that responds to an external stimulus like heat, and may return to its original state when the stimulus is removed.

Well explained and reasoned	*2 marks*
Some understanding	*1 mark*
No understanding or not attempted	*0 mark*

2 marks

2 (d) (ii) Phosphorescent ink e.g. absorbs light during the day and then glows at night.

e.g. fire exist sign, clocks and signs etc.

High level - clear and concise, including an example	*2 marks*
Low level - Poor understanding, lacks a clear example	*1 mark*
No understanding or not attempted	*0 marks*

2 marks

14 marks

3 Materials and the environment.

3 (a) (i) Manufacturer and environment: saves on packaging, weight of material, less energy to manufacture, less energy to transport, recyclable, flat printable surfaces-more economic.

High level - good understanding	*3 marks*
Medium level - some understanding	*2 marks*
Low level – limited understanding, simple unsupported statement	*1 mark*
No understanding or not attempted, one word answer	*0 marks*

3 marks

3 (a) (ii) Customer and environment: less environmental damage, recycle, biodegradable, environmentally friendly, renewable source, cost.

High level - good understanding	*3 marks*
Medium level - some understanding	*2 marks*
Low level – limited understanding, simple unsupported statement	*1 mark*
No understanding or not attempted, one word answer	*0 marks*

3 marks

3 (b)

Material	Product use or example	Why suitable?	Bio-degradable?
Card Spiral wound tubing	Packaging - smarties, Pringles, toilet roll tubes, wallpaper, posters (1 mark)	- High strength - 3D printable surface (2 marks)	Yes (1 mark)
Polypropylene sheet	Packaging - crisp packets, design folders, packaging, estate agent signs, signs (1 mark)	- Flexible - Variety of colours - Good scratch resistant surface - Easy to mould - Vacuum form (2 marks)	No (1 mark)
Foam board	Point of sale stands, presentation boards, signs (1 mark)	- Good strength to weight ratio - Good printing surface - Rigid board (2 marks) (1 fact = 1 mark + reasoning = 2 marks) 2 facts = 1 mark.	No (1 mark)

12 marks

18 marks

4 Product Lifecycle

4 (a) Introduction, evolution, growth, maturity, decline and replacement.
Manufacturer needs to know where a product is in its lifecycle so that they are ready to launch another product or develop another version of the same product. Products generally make more money in the early stages etc

Tick a correct response and indicate a grammar mark by placing a tick at the end of the passage. See MMS

A fully detailed and comprehensive response that includes details of most of the examples below. The answer is well-structured, with good use of appropriate design & technology terminology and showing a good grasp of grammar, punctuation and spelling.	*7 – 8 marks*
A detailed and comprehensive response that includes several of the examples below. The answer is well-structured, with good use of appropriate design & technology terminology and showing a good grasp of grammar, punctuation and spelling.	*5 – 6 marks*
A fairly detailed response which refers to some of the examples below. The answer is fairly well structured, with some use of design & technology terminology and with a small number of errors in grammar, punctuation and spelling.	*3 – 4 marks*
A response which contains very limited reference to any of the examples below. The answer is vague or poorly structured, with little use of design & technology terminology and with a considerable number of errors in grammar, punctuation and spelling.	*1 - 2 marks*
A response which is poorly structured with no relevant examples. There is very little or no use of design technology terminology and with many errors in grammar, punctuation and spelling.	*0 marks*

8 marks

4 (b) Throw away society - products designed to be disposed of instead of reused or maintained. Mass produced products.

Good understanding	*3 marks*
Some understanding	*2 marks*
Limited understanding	*1 mark*
No attempt or confused	*0 marks*

3 marks

4 (c) Built in product lifecycle-planned obsolescence, product designed to fail, to be replaced or become out dated, fashion / trends, technological advancements, consumer power etc. Do not accept shelf life or sell by date.

Good understanding	*3 marks*
Some understanding	*2 marks*
Limited understanding	*1 mark*
No attempt or confused	*0 marks*

3 marks

14 marks

5 3D Sketching

5 (a) **Isometric sketch**

High level - full size isometric sketch, good proportion, all details including, neat lines. (Length 90mm 4 or 5 squares from edge of box, look at proportions of screen to click wheel)	*5 – 6 marks*	
Medium level - good isometric sketch, some imperfections or omissions.	*3 – 4 marks*	
Low level - not isometric sketch, lacks detail, out of proportion, untidy.	*1 – 2 marks*	
Not attempted	*0 marks*	
		6 marks

5 (b) **Thick and thin lines - <u>case only ignore starter and given spider diagram</u>**

Good thick and thin lines which enhance the drawing	*2 marks*	
An attempt at thick and thin line	*1 mark*	
Not attempted	*0 marks*	
		2 marks

5 (c) **Black transparent shiny surface**

Good finish, use of highlights or shading	*2 marks*	
An attempt at rendering	*1 mark*	
No attempt	*0 marks*	
		2 marks

10 marks

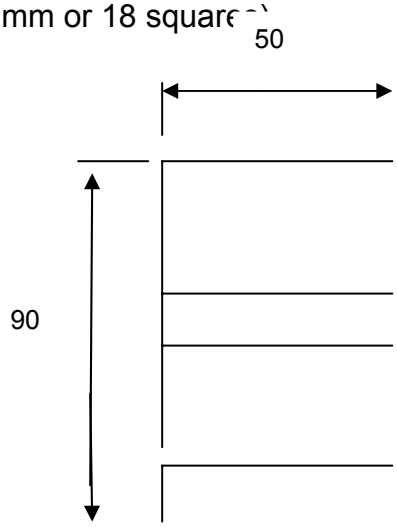
6 Card Engineering

6 (a) **Surface development:**

Must be relevant drawing (E.g. 0 marks for 3D drawing)

Correct width of net excluding flaps (50mm or 10 squares)	*1 mark*
Correct length of net excluding flaps (4 sides = 90mm or 18 squares)	*1 mark*

2 marks



Main glue flap	*1 mark*

1 mark

Suitable closures: Except any workable solution

High level - workable by a third party, successful, indicating glue or locking mechanism or friction mechanism must have dust flaps.	*3 marks*
Medium level - partially workable, some basic omissions.	*2 marks*
Low level - an attempt, does not close / fit confused.	*1 mark*
No attempt	*0 marks*

3 marks

Quality of drawing:

High level - neat line work.	*3 marks*
Medium level - some errors	*2 marks*
Low level - poor line work	*1 mark*
Not attempted	*0 marks*

3 marks

Using the key correctly	*1 mark*

1 mark

6 (b) **Symbols**

R - a registered design protects the design's shape, pattern or colour, the aesthetics of a design is protected can be a registered trademark (E.g. Lego, g registered, protected)

High level - exact meaning and importance	*3 marks*
Medium level – clear understanding	*2 marks*
Low level - some understanding	*1 mark*
No understanding	*0 marks*

3 marks

e - weight / volume, average weight of the content. Allows for tolerance.

High level - exact meaning and importance	*3 marks*
Medium level – clear understanding	*2 marks*
Low level - some understanding	*1 mark*
No understanding	*0 marks*

3 marks

16 marks

7 Designers

7	(a)		Robert Sabuda	*1 mark*	**1 mark**
7	(b)		**Description of making**		
7	(b)	(i)	*Cut – cut out the card and rabbit following the black solid lines looking for template, rabbit, outline, solid black line*	*1 mark*	
			Crease and fold – fold the rabbit and card along the dotted lines.	*1 mark*	
			Glue and assemble – glue the rabbit to the card, tab, glue	*1 mark*	
		(ii)	**Equipment**		
			Stage 2 - craft knife, cutting mat, safety ruler, scissors, rotary cutter	*1 mark*	
			Stage 3 - creasing bar, embossing tool, ruler, bone folder, back of scissors, creasing board tool	*1 mark*	
			Stage 4 - pritt stick, PVA, plastic spatula, glue stick, not generic glue or adhesive	*1 mark*	**3 marks**
7	(b)	(iii)	**Diagram - Needs to show the process, ignoring writing or labelling**		
			High level - well communicated, easy to follow the order of making. Self explanatory.	*5 – 6 marks*	
			Medium level - some confusion, needs interpretation.	*3 – 4 marks*	
			Low level - difficult to understand the order of making.	*1 – 2 marks*	
			Not attempted	*0 marks*	**6 marks**
					13 marks
				Total:	**120 marks**