AQA

GCSE

Design and Technology: Graphic Products

45501R

Mark scheme

4550

June 2015

Version 1 Final

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this mark scheme are available from aqa.org.uk

Question	Part	Sub Part	Marking guidance	Mark
1	a		**Produce a series of annotated sketches which show the initial ideas and development of your designs for the toothbrush handle**. • **Design Criteria** Award mark for considering each point: • be based on the theme of wild life • appeal to children up to the age of 10 years • be suitable for small hands to grip. Creative use of criteria (clearly understood 4 marks) 3-4 Some use of criteria 2 Little consideration 1 No consideration 0 • **Creativity and Quality of sketching. (overall impression, marking holistically):** High level- Range of creative ideas well communicated, with 1 or more idea developed in detail showing progression. Evidence of flair. Indication of colour considered 7-10 Medium level-adequate sketching with some creativity and originality. Some evidence of progression/development. 1 or more ideas developed or 1 idea developed extremely well. Likely to get 2 ideas with minimal development or 1 idea with better development Possibly colour considered. 4-6 Low level-poor quality, difficult to interpret or inadequate communication or little creativity. Little evidence of progression/development. Possibly a single idea or 2 poorly communicated. Poor quality sketches which do not convey the wildlife theme effectively. Maybe confused. 1-3 Not attempted – scribble 0 • **Notes explaining your sketches:** High level: Clear annotation which is analytical/critical/relevant/justified. 3 marks Medium level: Descriptive statements only 2 Low level: labelling only 1 Not attempted 0	**4** **10** **3**

1	b		**Produce a coloured 3D drawing of your final handle** **Mark what you see as correct this may be the whole tooth brush or just the handle.** • **Quality of the drawing: (Mark what is in the box)** High level: Good quality, evidence of possible crating and neat line work. Recognisable 3D drawing Eg. Any pictorial. 5-6 Medium level: adequate quality, recognisable, some inaccuracy. 3-4 Low level: Poor, difficult to interpret, confused. Mixture of pictorial methods. 1-2 Not attempted or in 2D 0 • **Application of colour:** High Level: Good solid block colouring or tonal shading. Enhances 3D effect. 3-4 Medium Level: Attempt at block colouring or tonal shading. 2 Low Level: low or graphite pencil only or poor attempt. 1 No colour or scribble or outline only. 0	**6** **4**
1	c		**Evaluate the final toothbrush handle you have drawn in part (b) against one of the design criteria given on page 4** **Design Criteria** The toothbrush handle must: • be based on the theme of wild life • appeal to children up to the age of 10 years • be suitable for small hands to grip. **Evaluation against one of the original design criteria:** High level: Analytical/critical including justification 3 Medium level: mainly descriptive 2 Low level: mainly self-congratulation 1 No attempt or not relevant 0	**3**

Question	Part	Sub Part	Marking guidance	Mark
1	d	i	**Name a suitable block modelling material for a prototype of your toothbrush handle.** **<u>(If d (i) is incorrect give d (ii) 0 mark)</u>** **Award 1 mark for each: (must be on this list)** Block modelling material-award marks for: Styrofoam, jelutong, expanded polystyrene, polymorph clay, plasticine, balsa wood, polyester block, hard wax. HD Polyurethane block.	**1**
1	d	ii	**Explain why the material you have chosen in part (d)(i) is suitable.** Award marks for: Easy to mould, shape, carve or sculpt. Readily available. Available in large sheets Relatively inexpensive Apply filler Apply a finish Don't need a specialist workshop Lightweight **<u>Do not accept strong, cheap or light</u>** Good explanation: Clear understanding of material properties. 2 An attempt: Some understanding of material properties 1 Not attempted or weak 0	**2**

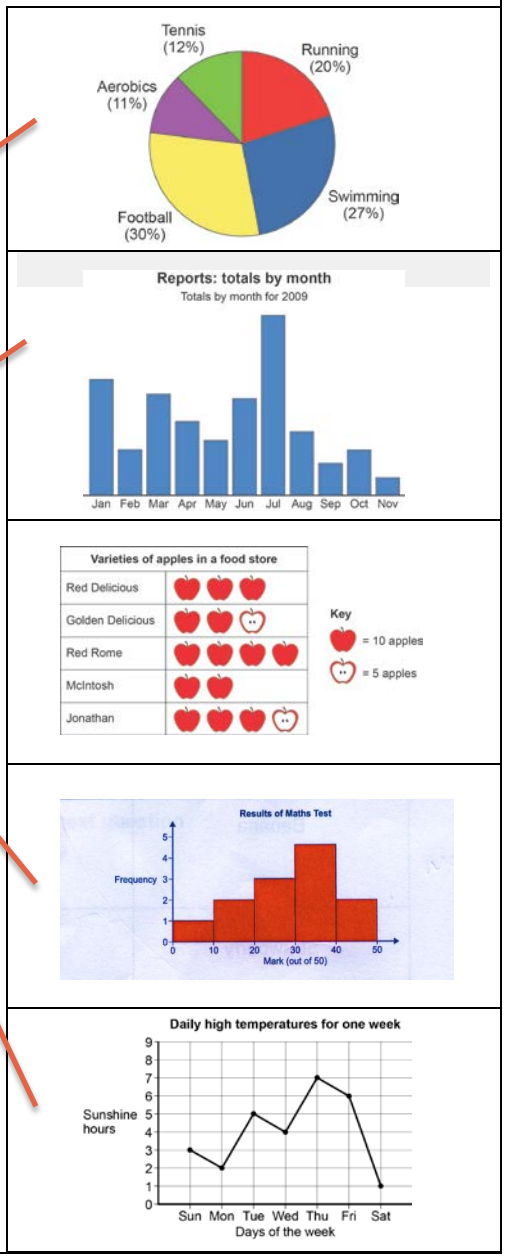
33 Marks for Question 1

Question	Part	Sub Part	Marking guidance	Mark	
2	a		**Draw a line to match the method of representing data with its graphical form** Award 1 mark for each correct response as illustrated below.	**4**	

Method

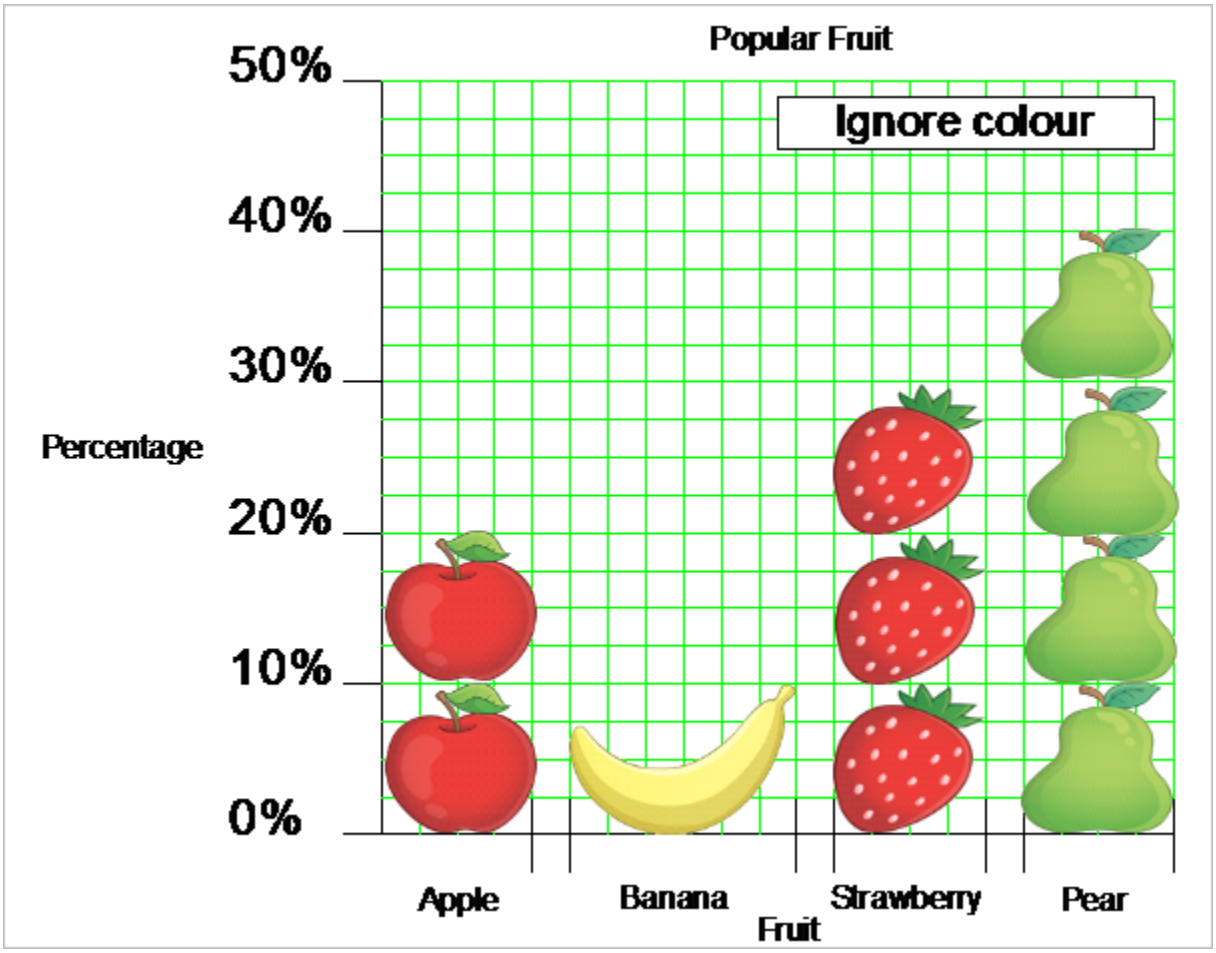
- **Line Graph**
- **Histogram**
- **Pie chart**
- **Bar chart**

Graphical form



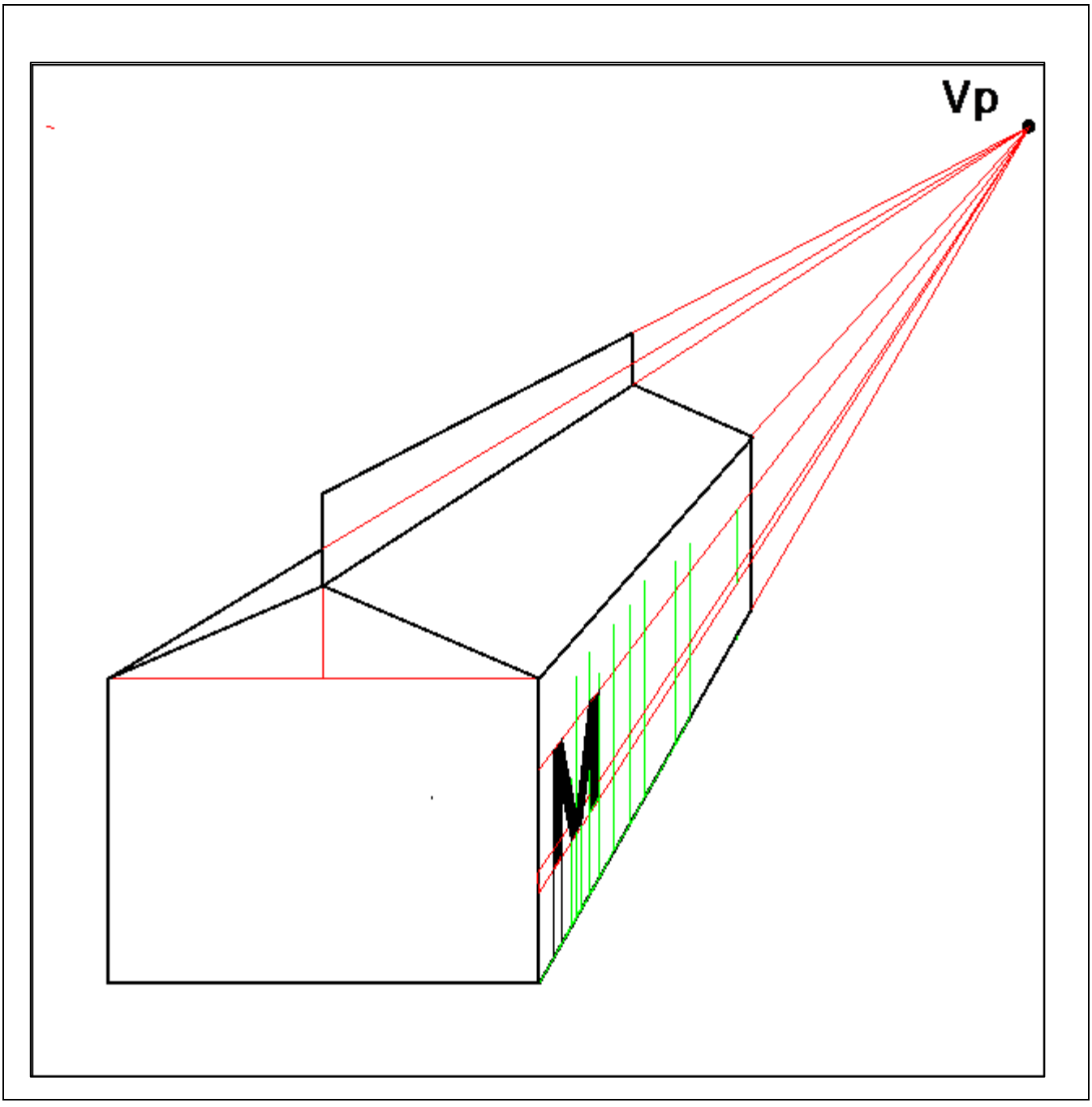
Question	Part	Sub Part	Marking guidance	Mark
2	b		**Describe one advantage of using a bar chart to represent data.** **Award for**: Easier to read/understand. Visual check. Shows each data category. Easily constructed. International language. Summarizes large data. Clarify trends better than tables. Estimate values at a glance. Well-reasoned 2 Some understanding. Eg Clear to see data, easy to read 1 Not attempted or poor 0	**2**

Question	Part	Sub Part	Marking guidance	Mark
2	c		**The results of a questionnaire to find out which fruit is most popular in the school canteen is shown below.** • **Accuracy of data: (Even if candidate has altered the scale, see script batch 1 no'1). New scale must be indicated on graph to mark accuracy, do not credit given apple max 3 marks)** 4 correct (must hit the top % line) 4 3 correct 3 2 correct 2 1 correct 1 Incorrect or not attempted 0 • **Use of symbols:** High level: Good representation. Consistently reproduced in shape and size. 3 Medium level: An attempt at reproducing the symbols. Some errors. 2 Low level: Poor representation of symbol, inconsistent in shape and size or modified(half symbols) 1 Not attempted 0 • **Labelling:** Graph title eg Popular Fruit 1 X-axis: eg Fruit 1 Y-axis: eg Percentage or % 1	**4** **3** **3**



16 Marks for Question 2

Question	Part	Sub Part	Marking guidance	Mark
3	a		**Using the information in figure 3, complete a full-size one point perspective sketch of the milk carton. The front corner of the carton has been drawn for you at point A.** **<u>If not one point perspective mark Line Quality ONLY.</u>** • **Award marks for accuracy**: <u>High level</u>: Accurate full size one point perspective drawing using the given sizes. 5-<u>6</u> Often the depth is incorrect (70mm)=5 marks max <u>Medium level</u>: Attempt at one point perspective drawing, some errors. 3-<u>4</u> <u>Low level</u>: Poor attempt at one point perspective. Maximum 2 marks for <u>front panel</u> draw correctly but drawing may be Oblique. 1-<u>2</u> Not attempted or incorrect method. Eg Two point perspective and isometric. 0 • **Evidence of construction lines:** <u>High level</u>: Evidence of construction lines to Vp and vertical lines(apex) 3 <u>Medium level</u>: Some evidence of construction lines 2 <u>Low level</u>: Limited evidence of construction lines 1 Not attempted 0 • **Line quality:** <u>High level</u>: Good line quality, straight lines, consistent, no gaps. 3 <u>Medium level</u>: Some errors. 2 <u>Low level</u>: Poor quality, scribble or double lines, smudges/bleeding. 1 Not attempted 0	**6** **3** **3**


Vp

3	b		**Complete the word 'milk' on the front panel. The stem for the letter 'M' has been started for you. Estimate any sizes not given.** **Award marks for:** Vertical lettering, evidence of perspective lettering to right Vp, construction lines, spacing between letters, solid letters, black, resembles font in question. Letters vertical and to Vp. **Mark MILK to the 3D drawing method used, even if isometric, oblique or 2 point perspective etc.** High level: Excellent representation. Max 5 marks If not solid black. 5-6 Medium level: Some evidence of considering the above. Some errors. 3-4 Low level: Poor attempt. Maximum 1 mark for correct construction lines or for full size 2D image. 1-2 Not attempted 0	**6**

18 Marks for Question 3

<table>
<tr><th>Question</th><th>Part</th><th>Sub Part</th><th>Marking Guidance</th><th>Mark</th></tr>
<tr><td>4</td><td></td><td></td><td>
Discuss the advantages and disadvantages of recycling packaging materials.

<u>Must tick relevant points.</u>

<u>Max 2 marks for relevant examples</u>

<table>
<tr><th>Advantages</th></tr>
<tr><td>Reduces waste
Saves resources (oil)
Few trees cut down (card)
Less land fill sites
More energy efficient to recycle such as aluminium cans than for raw bauxite ore
Reduces dependence on raw materials</td></tr>
</table>

<table>
<tr><th>Disadvantages</th></tr>
<tr><td>Expensive to collect-bins
Needs sorting
Uses energy
Cannot use recycled materials next to food products
Quality of recycled materials such as card is not as good as virgin materials. Eg Poor colour and strength.</td></tr>
</table>
</td><td></td></tr>
</table>

			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 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 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 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 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	**8**

8 Marks for Question 4

<table>
<tr><th>Question</th><th>Part</th><th>Sub Part</th><th>Marking guidance</th><th>Mark</th></tr>
<tr><td>5</td><td></td><td></td><td>
Award marks for each correct answer:

(Refer to table below)

<table>
<tr><th>Types of production method</th><th>Describe the production method</th></tr>
<tr><td>One-off</td><td>One-off production is when only one of the product is made.</td></tr>
<tr><td>Batch</td><td>Batch production is when a set quantity is made. It may also require a lot of labour, but jigs and templates are used to aid production. Often the machines can be easily changed to produce a batch of a different product (2 mark)</td></tr>
<tr><td>Mass</td><td>Mass production is when a very large number of the product is made, usually on a production line. The product changes regularly (2 mark)</td></tr>
<tr><td>Continuous</td><td>Continuous production is when many thousands or millions of products are made 24 hours a day and 7 days a week. (2 mark)</td></tr>
</table>
Describe the production method, award marks for: (3x2)

Clear understanding, well communicated 2

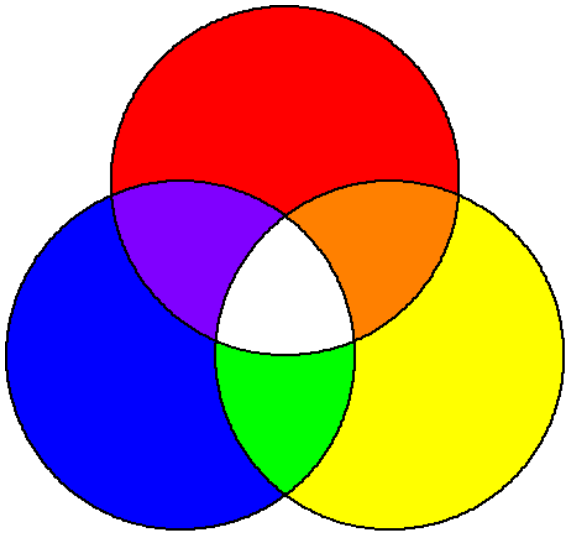
Some understanding, possibly confused or repetitive 1

Incorrect 0
</td><td>2
2
2</td></tr>
</table>

6 Marks for Question 5

Question	Part	Sub Part	Marking guidance	Mark
6	a		**Colours are often referred to as primary or secondary. Explain the difference between primary and secondary colours** Award marks for: Red, blue and yellow are known as primary colours. They cannot be made by mixing any other colours together. If we mix two of the primary colours together we get a secondary colour-green, purple and orange. High level: Thorough understanding of primary and secondary colours. 3 Medium Level: Some understanding, possibly only primary or secondary. Some omissions or errors. 2 Low level: Limited understanding. Confused 1 Not attempted or not relevant. 0	**3**

Primary – large colours
Secondary – smaller colours



Question	Part	Sub Part	Marking guidance	Mark
6	b	i	**Explain how colour is used to help communicate meaning of these <u>signs.</u>** Figure 5-Red is the colour of fire and is therefore considered a 'hot' colour. We often associate red with such things as love and danger. Red signs with a white background are do not signs. Awards marks for: Good explanation 2 Some understanding or explanation of sign, not relating to sign. 1 Poor or not attempted 0	**2**
6	b	ii	Figure 6-Green is symbolic of the natural world and is considered 'calm' colour. It is used to indicate first aid and safety. Green signs displaying information in white are safety signs. Awards marks for: Good explanation 2 Some understanding or explanation of sign not relating to sign. 1 Poor or not attempted 0	**2**
Question	Part	Sub Part	Marking guidance	Mark
6	c		**Giving an example, explain why the use of colour is important when considering the aesthetics of a product.** Colour is an essential factor in the success of a product and is often the first thing that draws a person's attention towards it. Colour communicates meaning and associations, helps to define moods, affects the way we feel about products. Not to be a distraction. Eg operating machinery. Bright colours draw attention. Eg grab rails on buses-visual impairment. Awards marks for: Good explanation 2 Some understanding 1 Poor or not attempted 0 **Appropriate example** 1	**3**

10 Marks for Question 6

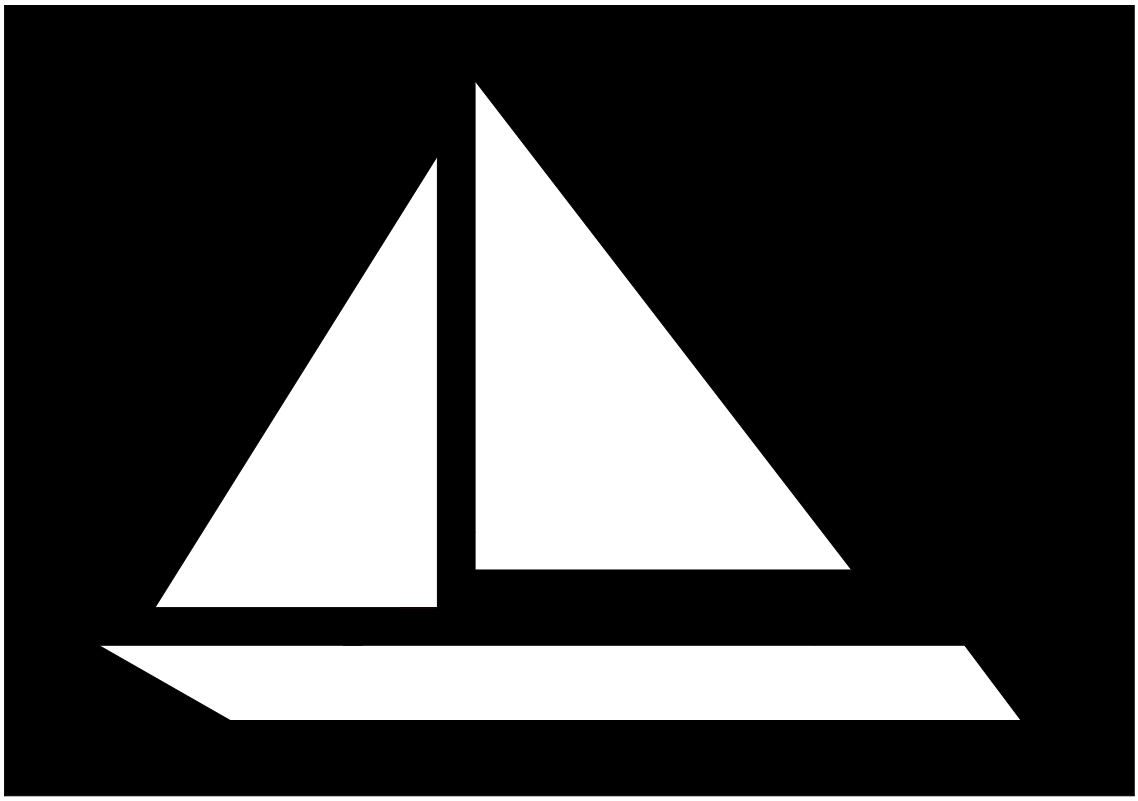
Question	Part		Marking guidance	Mark
7	a		**Explain what is meant by the term just in time (JIT) when printing a graphic product.** Just in time production is when a company only buys enough stock to cover its immediate needs. It ensures that the right amount of material arrives when needed. This makes production more economical, because it: • reduces storage cost • allows production runs to change more quickly • reduces overstocking of materials Reference to: On demand manufacture Controlling stock Controls the right amount of materials/products arrive at the right time. Companies operate more economically. Reduces storage costs. Production run can be more easily changed. Reduces over-stocking of products. Reduces storage spaces. Very reliant on suppliers. Small mistakes can lead to large delays. Very reliant on suppliers Small mistakes can lead to large delays High level: Thorough understanding of JIT relating to printing. 3 Medium Level: Some understanding of JIT 2 (Max 2 marks for reference to 'retail'. Low level: Limited understanding 1 Not attempted or not relevant. 0	**3**

7	b		**The marks around the edge of the page have different meanings. Give the name and the meaning of each set of marks labelled.** Label A-Registration mark 1 mark Label B-Colour bar 1 mark Label C-Crop marks 1 mark **Meaning**-award 2 marks for each meaning: (3x2 marks) **Registration mark**-To align, or register the four printing plates. Added to each plate in exactly the same position. The registration marks will be checked regular to see if the colours are in the correct position. **Colour bar**-To ensure the colours are perfect. Colour bar is added to the side of the image to show the density or tints (%) of the individual colours. Adjustments can be made, if necessary. **Crop marks**-Located at each of the four corners of the printed sheet. These show where the outline of the finished page should be and they thus guide the printer exactly where to cut or guillotine, when trimming to the final size Good understanding 2 marks Some understanding 1 mark Not attempted or incorrect. 0 mark	**3** **3** **3**
7	c	i	**The starfish is going to be 'foil blocked'. Explain this special printing effect.** Make the product look expensive. It works by stamping pre-glued metallic foil onto the printed surface using heat and pressure. Used on cards and expensive packaging. Gold and silver are popular foils, but now available in a variety of colours. Good understanding 2 Some understanding 1 Not attempted or incorrect. 0	**2**

Question	Part	Sub Part	Marking guidance	Mark
7	c	ii	**Explain the effect of foil blocking on the cost of the sticker book.** Foil blocking are usually added after the main print process. Extra process and therefore extra cost due to time, materials and equipment costs. Award marks for: Good understanding 2 Some understanding 1 Not attempted or incorrect. 0	**2**

16 Marks for Question 7

Question	Part	Sub Part	Marking guidance	Mark
8	a		**Give two safety precautions that are necessary when using the following equipment.** **Craft knife**. Award 1 mark for each correct answer: Using a cutting mat/self-healing mat Using a safety rule (Maun) Carry either on a cutting mat or blade down Keep spare hand behind the craft knife. Cut away from yourself Retractable blade or lid or lock **Do not accept** gloves, metal rule, keeping hands away, don't cut yourself.	**2**
8	b		**Aerosol spray**. Award 1 mark for each correct answer: Use a spray booth or well ventilated room Use outside Use away from a naked flame. Wear a mask. Use extractor	**2**
8	c		**Draw a suitable stencil of the sailing boat in the box below.** Award marks for: <u>High level</u>: Effective stencil-at least a 5mm spacing between the hull and sails. Adequate space around the boat. (not too close to the edge). Fills the rectangle. Use of geometric shapes. Good proportions. With or without mast. Sail may be curved. 5-<u>6</u> <u>Medium level</u>: As above but with omissions or errors. Attempt at spacing-segmentation Or simplification 3-<u>4</u> <u>Low level</u>: An attempt but lacks accuracy and detail. Max 1 mark for copy 1-<u>2</u> Not attempted 0	**6**



Question	Part	Sub Part	Marking guidance	Mark
8	d		**Explain how Computer-Aided-Manufacturing (CAM) equipment could be used to produce a stencil.** **<u>This question is about Process.</u>** Possible CAD machinery: Stika, cutter/plotter, vinyl cutters, CAMM1, laser, micro routers, CNC millers, 3D printer etc. Suitable material which could be used to make the stencil: Laminated card Varnished card Acrylic PP HIPS Explanation. The image of the stencil is down loaded from the CAD system to the appropriate CAM machine including machine settings such as power, speed, cutting depths etc. The material is loaded into the CAM machine. The CAM machine may need to be set using autofocus and/or other datum settings. The CAM machine and extractor can be started to cut the stencil. Award marks for: <u>High level</u>: Thorough understanding of CAM process . 3 <u>Medium Level</u>: Some understanding of CAM process 2 <u>Low level</u>: Limited understanding of CAM process 1 Not attempted or not relevant. 0	**3**

13 Marks for Question 8

Total 120 marks