



Mark Scheme (Results)

Summer 2018

Pearson Edexcel GCE Advanced Subsidiary
In D&T: Graphic Products
6GR02 Paper 1

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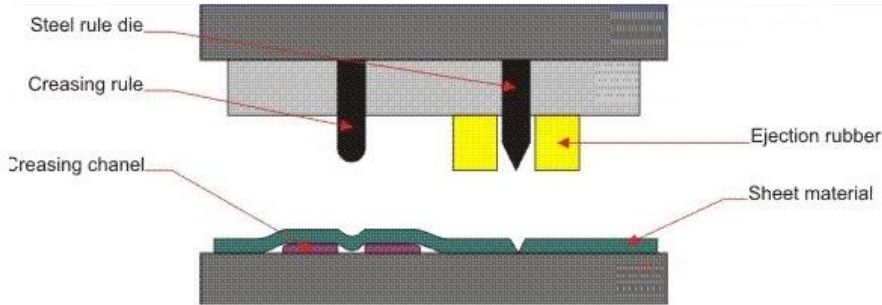
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General Marking Guidance

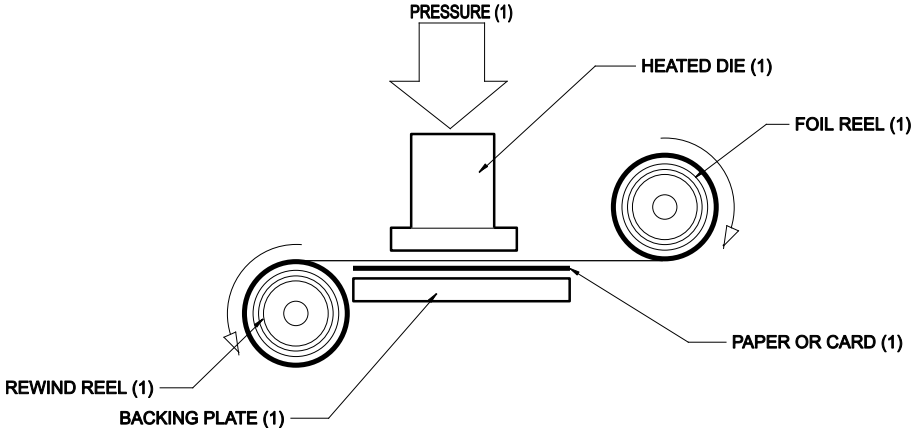
- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question Number	Answer	Mark
1(a)	Award one mark for each characteristic up to a maximum of 2 marks 1. Low density/lightweight (1) 2. Stiff/rigid (1) 3. Made up from multiple layers (1) 4. Smooth surface (1) 5. good printing surface (1) 6. can be cut/scored/bent/creased without splitting (1) 7. Can have surface finish applied (1) Do not accept easily folded (the clue is in the name) Do not accept can be printed on	(2)
1(b)	Award one mark for an appropriate reason, and further marks for linked explanation. 1. Process is more accurate/precise/consistent (1) removing human error (1) 2. Allows for tessellation of nets (1) reducing wastage (1) 3. Can cut and score/crease at the same time (1) saving time (1) 4. Optical sensor (1) monitors the position of the work (1) 5. Data feed back to a computer (1) which aligns the die with the crop marks (1) 6. Batches of/Multiple/ Identical nets can be cut (1) at speed/ Dies can be reused (1) 7. Unskilled labour can be used (1) as operating system very simple/reduced labour cost. (1) 8. Automated process (1) reduces lead times/increase rate of production/ allows continuous production/faster than by hand (1) (1x2)	(2)
1(c)	Award one mark for an appropriate reason, and further marks for linked explanation. 1. The machine has two switches (1) that must be pushed simultaneously before it will cut(1) 2. The die cutter has full guards (1) preventing contact with the cutting blades / moving parts (1) 3. Light beams can be used (1) which stops operation if the beam is broken (1) 4. Machines are fitted with emergency stop button (kill switch) (1) meaning it is possible to isolate power/stop machine quickly (1) (1x2)	(2)

1(d)	Award 1 mark for each identified point, up to a maximum of 4 marks <i>Max 3 marks for accurate sketch with no annotation/simple labelling of parts</i> <i>Max 3 marks written answers without sketches</i>  1. steel die rule/blades cut the outlines of the net(1) 2. Creasing rule/matrix is used for where folds need to be made (1) 3. Paper/board/substrate placed in die cutter (1) 4. The creasing channel houses the substrate/board/paper to allow the crease to be made (1) 5. Pressure/downwards force applied (1) 6. Board/paper/sheet material is cut by the cutting die (1) 7. Board/paper/sheet material is scored by the rules (1) 8. Ejection rubber prevents the cut net from getting stuck in the cutter (1) Accept alternative terms that are accurate/appropriate	
	(4 x 1)	(4)
	Total for question	10

Question Number	Answer	Mark
2(a)	Award one mark for each valid point 1. Pigments allow the sign to glow in the dark (1) 2. No further illumination is needed (1) 3. Still visible during a power cut or in emergency lighting conditions (1) 4. Does not require a power supply/source (1) (2 x 1)	(2)
2(b)	Award one mark for an appropriate property, and one further mark for expansion. 1. Low density/lightweight (1) therefore does not add weight to the sign/easier to fix to walls/allows light weight fixings (1) 2. Can be easily drilled (1) allowing mechanical fixings to be used (1) 3. Is highly malleable (1) so can be rolled to plate form easily (1) 4. Corrosion resistant (1) therefore has a long life span (1) 5. Non ferrous (1) so will not rust (1) 6. Durable (1) so will last a long time (1) (1 x 2)	(2)
2(c)	Award one mark for a reason, with a further mark for expansion, upto two marks each, up to a maximum of four marks. 1. Aluminium is not porous (1) therefore the printing inks need to be thicker/more viscous as used in flexography (1) 2. As a relief printing process (1) large areas of solid colour can be easily produced (1) 3. The image contains solid colours (1) which means only one plate per image is required (1) 4. Printing plates can be made quickly from solid or liquid photopolymer (1) meaning plates are relatively low cost to make (1) 5. Increased speed of production (1) due to automated process / fast drying inks/reduces overall production time(1) 6. sign is made from 2 colours only (1) making flexography suitable due to limited colours/ block graphics (1) 7. Produces a good quality image (1) that is consistent/does not feather at the edges (1) (4)	(4)
Total for question		8

Question Number	Answer	Mark
3(a)	- Simplest form of binding (1) - Inexpensive process/Does not add significant cost to the magazine (1) - Pages are stapled through the fold in the magazine (1) - Magazine can lie flat/folds flat allowing double page spreads (1) - Suitable for magazines with an even number of sheets(1) - Suitable for magazines with an limited number of sheets(1) - Ideal for use with a signature feed (1) - Can be produced by an automated process (1) - Can be used with a range of different paper types (1) - Relatively robust when used for magazines (1) - Allows centre-fold pull out posters (1) - Fast process compared to alternatives/no adhesive drying time (1) (4 x 1)	(4)
3(b)	Award one mark for identifying a reason and a further mark for expansion up to a maximum of two marks for each. Any two of the following: - Coating cover pits in paper (1) giving a smooth/ flat surface (1) - Range of surface finishes available (1) such as gloss / matt / satin / silk (1) - Allows for high resolution/high quality outcomes (1) which enhances printing/makes the magazine more appealing (1) - Improves durability/ water resistance of the paper (1) extended the lifespan of the magazine/pages less likely to tear (1) Answers must focus on why coated paper is suitable for use in magazines. (1x2) (1x2)	(4)
3(c)	Wet End Section - Wood pulp diluted with water/ to form slurry/ 99% water and 1% pulp. (1) - Slurry held in the head box. (1) - Slurry put/pumped through slit/slice/gate (1) - Onto moving mesh/gauze bed. (1) - Belt vibrated water drained off (1) - Suction box under belt to help remove water. (1) - Allows fibres to interweave. (1) - Dandy rolls smooth out fibres/adjust thickness of the paper (1) - Raised pattern/dandy roller can be used to apply a watermark. (1) Note: marks can only be awarded for the wet end section, not other stages of the paper making process.	(4)
Total for question		8

Question Number	Answer	Mark
4(a)	Award one mark for each of the following descriptions: <i>Max 3 marks for accurate sketch with no annotation/simple labelling of parts</i> <i>Max 3 marks written answers without sketches</i> 1. Pressure/force applied to the die(1) 2. Heated die that is pressed onto foil (1) 3. Backing/surface/table plate that provides a flat surface for the cutting/bonding of foil(1) 4. Foil reel feeds foil continuously into machine (1) 5. Rewind reel collects waste (1) 6. Paper/card placed underneath foil (1)  <i>To gain full marks, the sketch must show Heated Die otherwise a maximum of 3 marks. The combination of sketches and annotations must provide a description of the process in order to achieve full marks.</i> Note - focus is on mass production, therefore hand methods are not appropriate. (4x1)	(4)
4(b)	Award one mark for a valid method, and a second mark for expansion. 1. UV Varnishing/Varnishing (1) to protect the materials used for the product/make it look glossy (1) 2. Spot varnishing (1) to enhance individual parts of the design (1) 3. Embossing/debossing (1) to give a tactile effect/make features stand out (1) 4. Laminating (1) to protect the packaging when it is handled/add a glossy coat (1) 5. Fragrance burst ink (1) to add a novelty effect (1) 6. Silver latex scratch off panels (1) to allow promotions/competitions (1) Do not accept encapsulation/encapsulating (1x2) (1x2)	(4)

4(c)	Answers must be given in full. Award marks for relevant points noted. 1. has a good surface for printing (1) 2. has good strength (1) 3. impact resistance / toughness / durable (1) 4. is very rigid when used for boxes (1) 5. High end board that provides a quality feel to the product (1) 6. can be foil blocked / embossed / blind embossed easily/varnished (1) 7. made from pure pulp so will have no contaminants for the chocolates (1) 8. has a pure white surface to enhance print colour (1) 9. Easy to cut/score/die cut (1) 10. Non-toxic / inert material (1) (6x1)	(6)
Total for question		11

Question Number	Answer	Mark
5(a)	Award one mark for identifying a reason and a further mark for expansion up to a maximum of two marks. 1. Lack of physical contact (1) produces a clean edge/edge (1) 2. Reduces human error/increased precision due to computer controlled (1) can be repeated easily for multiple copies (1) 3. Complex/intricate shapes can be cut easily (1) including the ability to incorporate engraving/etching within the same operation (1) 4. Easy to setup (1) as there are no work holding issues (1) 5. Higher production rates compared to traditional methods/ labour saving compared to traditional methods (1) reducing the costs of production of the display (1) 6. edges are self finishing (1) reducing need for additional processes/speeding up production/reducing costs/improves aesthetics(1) 7. Can engrave/etch (1) to include corporate logos (1) 8. Accurate designs can be cut out (1) as the laser cutter is controlled directly from the CAD software (1) (1x2)	(2)

5(b)	Award one mark for a valid advantage, with a second mark for expansion; and one mark for a valid disadvantage, with a second mark for expansion Advantages 1. Has good structural strength (1) so can support the weight of the display (1) 2. Can be cut easily (1) allowing structures to be constructed easily (1) 3. Renewable resource (1) therefore is readily available (1) 4. Can be glued/screwed/nailed (1) reducing the time to construct the structure (1) 5. Low cost material (1) therefore does not add significantly to the cost of the display (1) 6. Grain can add visual appeal (1) making the display more attractive (1) Disadvantages 1. Not available in large sheets (1) unlike manufactured boards (1) 2. Can warp/twist/bow (1) if the sections are too thin to support the loading/making the stand unstable (1) 3. Can be easily damaged/split (1) reducing the lifespan of the display (1) 4. Wood rots if it used outside (1) so will need finishes applied (1) 5. Contains knots (1) which can weaken smaller structural sections (1) (2 x 1) (2 x 1)	(4)
	Total for question	6

Question Number	Answer	Mark
6(a)	Award marks as follows: • Camera drawn in isometric in approximate correct proportions (1) Then award marks as follows: The following drawn in approximately the correct location, orientation and proportion • Four rounded corners (1) • Outer lens projecting (1) • Inner lens in recess (1) • Flash projecting (1) • Both buttons on top of the camera projecting (1) Camera may be orientated with the front to the right (opposite to the above) Maximum 3 marks if an oblique/perspective drawing is produced. No marks for 2D drawings/orthographic projections. (6x1)	(6)

6(b)	Answers must be given in full. For full marks consideration should be made to both quality control and quality assurance. If only one is considered, award a maximum of 5 marks. Quality Assurance 1. Management process (1) 2. Controls the flow of information and drawings (1) 3. Quality of components monitored by quality control checks. (1) 4. The implementation of quality control checks/QC checks form part of the framework(1) 5. Applied at every stage of design & manufacture. (1) 6. To ensure that conforms to the specification. (1) 7. To ensure that the product is fit for purpose. (1) 8. Ensures materials are of the required quality (1) 9. To make identical products with zero faults. (1) 10. Supplies fact based evidence for quality management systems. (1) 11. External QA checks employed (ISO/BS/CE) (1) 12. Ensures that high quality standards are maintained throughout the organisation and suppliers (1) 13. Every activity within a company (e.g. standards, procedures, documentation and communication systems) is established and monitored. (1) 14. A Quality Manual is developed which defines the best way of doing things and which can be followed by all staff (1) 15. Departments within a company treat each other as clients or customers (1) 16. Allows the highest levels of service and attention to detail to be achieved (1) 17. A quality assurance system is said to increase customer confidence. (1) 18. It focuses on quality earlier in the development process than QC. (1) 19. Quality assurance comprises administrative and procedural activities/sets up procedures and systems. (1) 20. QA principles: "fit for purpose" and "right first time" (1) 21. QA is a planned activity by the manufacturer to monitor product quality (1) 22. QA includes customer feedback (1) Quality Control 23. Checking for accuracy/tolerance. (1) 24. Checking for safety (1) 25. Checks carried out throughout manufacturing (1) 26. Check could be visual/automated/computerised/use of CMM (1) 27. Testing could be destructive/non-destructive (1) 28. Use of functional testing (1) 29. QC checks against the specification (1) 30. So that the product meets expectations. (1) 31. 100% sampling/sample sizes for inspection (1)	(6)
	Total for question	10

Question Number	Answer	Mark
7	A balanced response should be put forward. Consideration of both the use of Styrofoam™ and rapid prototyping must be included for full marks. If only one type of modelling is considered, award a maximum of 7 marks. Maximum of 7marks if the response only covers advantages or disadvantages Maximum of 6 marks if the response only covers advantages or disadvantages of one type of modelling. Styrofoam™ modelling. Advantages 1. Models can be constructed quickly (1) 2. Foam can be cut/shaped easily with hand tools/hot wire cutter (1) 3. Components are easy to glue with PVA (1) 4. Models are lightweight (1) 5. Surface finishes can be added (1) 6. Very smooth surface finishes are possible (1) 7. Does not need expensive machinery/equipment (1) 8. Designs can be modified as they are being made (1) 9. Inexpensive material to use (1) Disadvantages 10. Unable to show fine details (1) 11. Models are not very robust/easily damaged (1) 12. requires a high degree of skill (1) 13. Hot wire cutter gives off fumes in use / dust from hand tools(1) Rapid prototyping. Advantages 14. Allows fine detail to be produced (1) 15. Can give a realistic representation of the final product (1) 16. Working models can be produced(1) 17. Hollow models are possible (1) 18. Allows use of component libraries (1) 19. Allows for collaboration between designers (1) 20. Additive process, therefore no waste materials (1) 21. Once designed, there will be no human error in the model (1) 22. Model is easily repeated (1) Disadvantages 23. Machines can be very slow to produce a model (1) 24. Requires expensive CAD/CAM facilities (1) 25. Models can be limited in size (1) 26. Training required to operate equipment (1) 27. have to wait for model to be finished before it can be evaluated and modified (1) 28. Machine needs to be calibrated (1) 29. Setbacks can be caused if software crashes (1) 30. Machine could malfunction/block (1)	(8)

	31. Software updates often required (1)	
	(8 x 1)	
	Total for question	8