



Mark Scheme (Results)

Summer 2019

Pearson Edexcel GCE A-Level
In Design and Technology: Resistant Materials
6RM02/01

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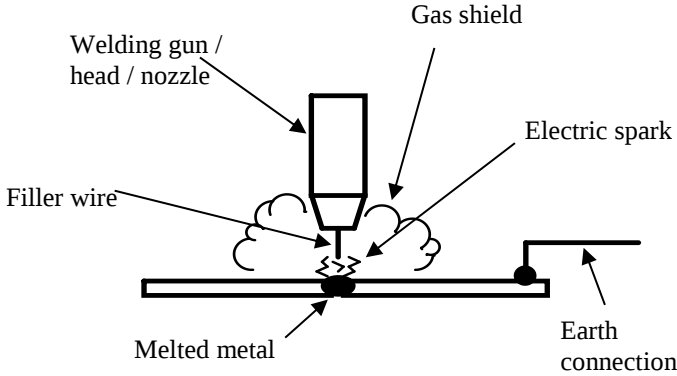
General Marking Guidance

- 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)	The following: 1. Rotational moulding / blow moulding / GRP (1) 2. Extrusion (1) 3. Injection moulding / compression moulded (1) (3 x 1)	3
1(b)	Any two of the following with a linked relevant explanation: 1. Will resist heat / will not melt (1) from an electrical fault. (1) 2. Stronger (1) so not likely break under force. (1) 3. Harder (1) so will resist scratches / dents / penetration more. (1) (2 x 2)	4
	Total for question	7

Question Number	Answer	Mark
2(a)	Any two of the following: 1. Heat to red hot / cherry red / upper critical point / 800 – 1000°C / very hot. (1) 2. Maintain heat / soak for a short time. (1) 3. Leave to cool / cool slowly / bury in sand. (1) (2 x 1)	2
2(b)	Any six of the following: 1. Tough (1) 2. Hard (1) 3. Malleable / plasticity (1) 4. Elasticity (1) 5. Cheap (1) 6. Machinable (1) 7. Readily available (1) (6 x 1)	6
	Total for question	8

Question Number	Answer	Mark
3(a)	Any six of the following: 1. Larger sheets (1) 2. Split resistant (1) 3. Stable / doesn't warp / shrink / twist / cup (1) 4. No knots (1) 5. Uniform strength (1) 6. Cheaper (1) 7. Less risk of splinters (1) (6 x 1)	6
3(b)	Any seven of the following: 1. Apply release agent / polish / wax to the mould (1) 2. Gel coat mixed/ resin mixed with hardener / pigment (1) 3. Gel / resin coat applied (1) 4. Add / spray a layer of glass fibre (1) 5. Add a layer of resin / work resin into glass fibre layer (1) 6. Repeat for subsequent layers (1) 7. Allow to set / cure (1) 8. Remove and trim edges (1) (7 x 1)	7
	Total for question	13

Question Number	Answer	Mark
4(a)	Any of the following clearly identifiable in either diagram or text form:  1. Welding gun/nozzle. (1) 2. The work is electrically connected to an earth cable. (1) 3. An electrical spark generates the heat. (1) 4. A filler wire is fed through the welding gun nozzle. (1) 5. The heat generated melts the filler wire and the metal together. (1) 6. A gas /argon shield is fed over the weld pool. (1) (5 x 1)	5
4(b)	Any of the following: 1. Touching hot metal / burns (1) 2. Glare / arc eye from electric spark (1) 3. Fumes can affect breathing (1) 4. Electric shock (1) 5. Flying sparks may ignite / scorch surroundings (1) 6. The proximity of other personnel (1) (5 x 1)	5
	Total for question	10

Question Number	Answer	Mark
5(a)	Any four of the following: 1. Align the two material pieces. (1) 2. Drill a pilot hole. (1) 3. Drill a clearance hole in the upper piece. (1) 4. Countersink the clearance hole. (1) 5. Tighten / fit the screw. (1) (4 x 1)	4
5(b)	Any eight of the following, but must contain at least one advantage and one disadvantage: Advantages 1. Can cut more intricate shapes. (1) 2. No splintering on edges. (1) 3. Engraved details show up better as they are darker. (1) 4. Do not need tool changes due to blunting / breakages. (1) 5. No swarf / saw dust. (1) 6. No material clamping (1) 7. Faster production rate. (1) 8. Narrower kerf so less material wasted between components. (1) Disadvantages 9. More expensive laser ply is required to avoid charred edges. (1) 10. Lasers are more expensive to buy. (1) 11. Gives off toxic fumes / extraction systems required. (1) 12. Expensive to maintain / filters / laser recharging. (1) (8 x 1)	8
	Total for question	12

Question Number	Answer	Mark
6 (ai)	Any four of the following: 1. Slow / takes a long time (1) 2. Expensive (1) 3. Skilled / manual labour (1) 4. General tools / flexible / adaptable equipment and machinery (1) (4 x 1)	4
6 (aii)	Any two points from the following explanation: For a single item it is the fastest method of production (1) with minimal cost (1) while allowing the flexibility to modify the design. (1) (1 x 2)	2
6 (b)	Any four of the following: 1. Can be moulded into more complex shapes. (1) 2. Better insulator (heat / electrical). (1) 3. Lighter weight. (1) 4. Available in wide range of colours. (1) 5. Body and handle can be moulded as a single part rather than needing a separate non-stainless steel handle. (1) 6. Warmer to the touch (tactile). (1) (4 x 1)	4
Total for question		10

Question Number	Answer	Mark
7	Any 10 of the following, but must include at least one advantage and one disadvantage to gain full marks: Advantages 1. Ensures a high quality / thoroughly tested product. (1) 2. Increases reputation of business. (1) 3. Increased sales / profits (1) 4. Errors can be identified earlier. (1) 5. Few reject components /products / less wastage. (1) 6. Detailed monitoring helps drive improvement. (1) 7. Less repairs / replacement products needed. (1) Disadvantages 8. Costs more money. (1) 9. More employees needed. (1) 10. Development time / lead time / increased. (1) 11. Reduced production rate. (1) (10 x 1)	10
	Total for question	10

