



Mark Scheme (Results)

Summer 2018

Pearson Edexcel GCE A-Level
In D&T: Resistant Materials (6RM03)
Paper1 Designing for the future

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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)	1. Heat stabiliser (1) 2. Light/UV stabiliser (1) 3. Ozone stabiliser (1)	(2)
1(b)	1. To stop microbiological attack (1) 2. To stop staining/discolouration / keep their colour (1) 3. To stop it smelling / rotting / decaying / degrading (1) 4. To maintain its mechanical properties / less brittle / stronger (1) 5. To stop reduction in electrical insulation (1) Do not award: Durable as this is a generic term which applies to all of the bullet points Stability as this is in the question	(3)
1(c)	1. Increased volume / bulk / size / expands (1) 2. Increased elasticity / flexibility / less brittle / softer (1) 3. Increased buoyancy / floats (1) 4. Decreased density (1) 5. Increased insulation(sound/heat)(1) Do not award: Mass or Weight as these don't change	(3)
Total for question		8

Question Number	Answer	Mark
2(a)	1. Products/parts are easy to dismantle / disassemble / temporary / knock-down / standard fastenings / (1) 2. Do not bond / glue / use easy to separate bonded / glued / different materials (1) 3. Use as few different materials as possible / only one material (1) 4. Use as few parts as possible (1) 5. Coding/marketing / labelling materials so they can easily be identified (1) 6. Make products from materials which require low energy for recovery (1) 7. Few/no surface finishes (1) Do not award: Simple designs, too vague and not always possible Recycling, as this is not what the question is focussed on	(5)
2(b)	1. Faster than a person/ability to process huge amounts of data/reduced lead time / reduced paper handling (1) 2. Specification can be easily sent /stored / shared / exported / central / global access/increased accessibility (1) 3. Easy editing / updating (1) 4. Can draw on expert / AI systems / linked to CIM (e.g. CAD/CAM/FMS/QRM/JIT etc.) systems (1) 5. Specification accuracy / reliability / reduced human error / easier to read (1) 6. Improved product quality 7. Save money / cheap process (1) Do now award: Faster/quicker as stand-alone statement - it must be qualified e.g. BP1	(4)
		9

Question Number		Mark
3(a)	Award any FOUR answer from the following 1. Aerodynamics/reduced drag/resistance to movement / efficient form / nautical / aeronautical (1) 2. Curved / smooth shapes / faces / surfaces / no sharp corners/angles (1) 3. Tear-drop/Round at the front/tapering to the rear (1) 4. Improved beauty/aesthetics through function / simplification / minimalism / function over form /form follows function (1) 5. Futuristic / sci-fi design (1) 6. Naturally efficient shapes of birds/fish (1) 7. Long horizontal / sleek / clean / lines (1) 8. Influences from improved manufacturing / industrial techniques / welding instead of riveting (1) Do not except: Modern as it is too vague for BP5 Improved aesthetics/beauty in isolation - must be linked to function / simplification	(4)
3(b)	Any four of the following points linked with a relevant explanation also from the following points. 1. Selling /selling into existing/competitive market / ‘unknown’ brand (1) 2. Marketing/advertising (1) 3. Culture/political/legislation differences 4. Specific market requires improved / changed products / meet / trends / needs of a the country (1) 5. Transport links/ distribution / distance between market and supplier (1) 6. Set up of new manufacturing facilities 7. High cost / set up cost (1) 8. Longer time for deliveries (1) 9. Communication 10. Language barriers / multi-lingual staff/interpreters needed(1) 11. Time zone differences (1) 12. Currency fluctuation (1) 13. Raise or lower relative price of goods (1) 14. Trade agreements (1) 15. Taxes/tariffs (1)	(8)
	Total for question	12

Question Number	Answer	Mark
4	Materials 1. Reduce packaging used/make packaging smaller (1) 2. Better quality / stronger / tougher materials (1) 3. Use recycled / recyclable / renewable / sustainable material / environmentally friendly / biodegradable polymers (1) 4. Fewer / less material types (1) 5. No/fewer surface treatments (1) Energy - 6. Simplify process/ reduced / low energy use during manufacture /energy efficient processes (1) 7. Alternative / renewable / green sources of energy (1) 8. Recover energy during manufacture (1) 9. Less energy hungry devices/require less power to run/use / standby option (1) 10. Use rechargeable batteries (1) Use 11. Ease of repair / replacement / availability of spares (1) 12. More durable / reliable product / lasts longer / packaging effectively protects the remote (1) 13. Only use when necessary / (1) Disposal 14. Reuse / recover / reconfigure to new device (1) 15. Increase cost /dissuade from sending to landfill / throw-away culture (1) 16. Make it easy to dismantle/dispose of / clear labelling (1) 17. Recycle it / can be recycled / recyclable (1) 18. Don't incinerate it (1) Only award a MAX of 2 marks per box Do not award marks if the answer is used in the incorrect box	(8)
	Total for question	8

Question Number	Answer	Mark
5 (a)	1. Rapid growth can lead to less dense/less strong /soft timber (1) 2. Places a greater demand on / require more water (1) 3. Damage to / degrading of soil / less chance for soil/earth/ground to recover between rotations / more fertiliser needed (1) 4. Potential harmful mutation of genes/ side effects are possible /long term effect not yet known / unknown (1) 5. Modified genes can spread / contaminate / get into the ecosystem if not contained (1) 6. Increased costs of timber /cost of research (1) 7. If insects / pests / fungus / disease become more tolerant to modified trees they may affect all trees in a more serious / faster way (1) 8. Public protest against genetic modification / unethical against nature (1)	(5)
5 (b)	1. Speed up/ automated/increased productivity / less down time (1) 2. JIT / match production to demand / delivery dates / quicker response to demand / reduced lead time / flexibility / minimise work in progress / keep / maintain a balance on production line / better work flow / flow of production (1) 3. Reduce errors/ human error / waste /cost (1) 4. Reduce stock/storage space (1) 5. Set/meet specified deadlines/workers have specific targets/maximise workforce potential (1) 6. Real-time processing and feedback / tracking (1) 7. Central / secure storage of data/accessible from anywhere / by everyone / efficient link between suppliers / manufacturers / retailers (1) 8. Rapid/easy / set-up / modification / editing of changes (1) 9. No language issues/easily/automatically translated/no poor handwritten copies / clear 10. Reduced staff/wages (1) Do not award: Numerous copies/re-printable as things would be stored electronically	(6)
Total for question		11

Question Number		Mark
6 (a)	1. Uranium / fuel source is abundant / plentiful / security for long-term production / reduces the need for fossil fuels to be used (1) 2. Lessens the greenhouse effect/ global warming / low / zero emissions / low pollution / cleaner (1) 3. Produces a small amount of waste (1) 4. Modern reactors are safer (1) 5. Comparably cheap to generate (1) 6. Produces a large/huge amount of energy / efficient (1) 7. Reliable /fast response to demand /needs/ supply of energy (1) 8. Power stations are relatively small / need little infrastructure can be set up in remote areas / anywhere (1) Do not award: Uranium is infinite/renewable resource Uranium extraction causes no environmental damage	(6)
6 (b)	1. Slow charging / takes longer to charge than fill with diesel / delayed delivery / delivery time increased (1) 2. Limited range / could run out / run out faster/ need recharging frequently (1) 3. Limited battery life / high cost of replacement / disposal (1) 4. Limited availability of charging/fewer charging stations than regular filling stations/route taken is determined by availability (1) 5. High initial cost of vehicle (1) 6. Limited choice of vehicle (1) 7. High servicing costs / repair costs /time / specialist required (1) 8. Size / weight of battery/power supply unit /limiting/reducing cargo space (1) 9. Pollution caused when producing electricity (1) 10. Danger to pedestrians due to lack of noise / can't hear them coming (1)	(6)
Total for question		12

Question Number	Answer	Mark
7	Size 1. Easily lost / misplaced / stolen / data / identity theft (1) 2. Ergonomics can be a problem / harder to use / less practical (1) 3. Harder to see / read / sight deterioration (1) Multi-functional / Complexity 4. Hard / complex to learn all / new aspects / apps / functions (1) 5. Different companies use different styles / displays / operating systems (1) 6. More thrown away/throw away culture (1) 7. Harder/more expensive to repair/dismantle/replace /spare parts/SIM cards/memory cards for old items not possible due to size change of components / replace over repair (1) Cost 8. High cost / time of development (1) 9. Expensive to buy / new / latest / smallest items / usually carry highest price / spend more money / become expensive (1) Status 10. Go out of fashion (1) 11. Jealousy / pressure to have /need to have the latest / trendiest /coolest items / only available to “richer” people/elitism / feel excluded / bullying (1) Social 12. Used anywhere / in public places / antisocial (1) 13. Used over speaking to someone directly / loss of social skills / less social interaction (1) 14. Not / never being able to escape work (1) 15. Addiction to devices /a distraction (1) 16. Use devices rather than go out/rent DVDs/go to cinema / obesity / lack of physical exercise (1)	(10)
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