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Mark Scheme (Results)

Summer 2014

Pearson Edexcel
GCE in Design & Technology
6RM02 01
(Paper 01: D&T in Practice)

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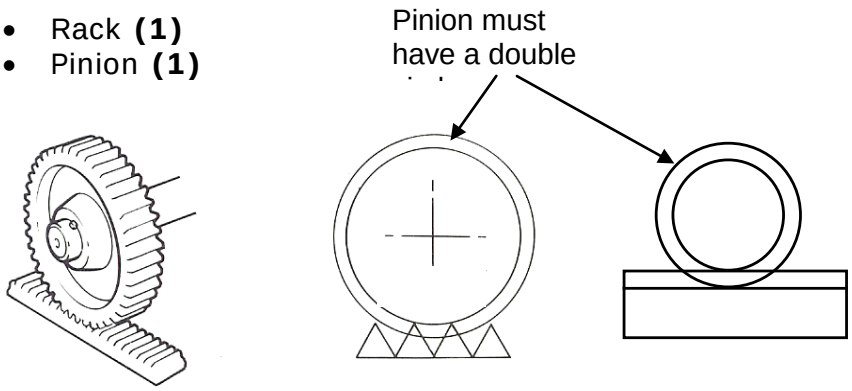
General Marking Guidance

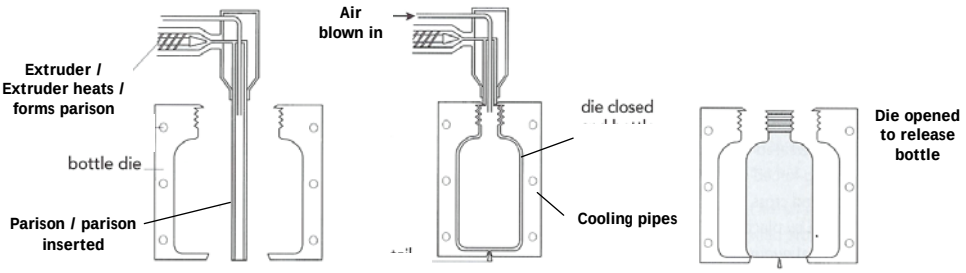
- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should 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 **three** characteristics:- • Do not contain iron / ferrite **(1)** • Do not rust / corrosion resistant **(1)** • Non magnetic **(1)** **(3 x 1)**	**(3)**
1(b)	The following **two** metals:- • Copper **(1)** • Zinc **(1)** **(2 x 1)**	**(2)**
1(c)	Any **four** of the following:- • Metal cleaned with an abrasive **(1)** • Work clamped / wired together **(1)** • Flux applied **(1)** • Heat applied **(1)** • The solder cut up/applied/fed-in **(1)** • A stated temperature between 625 - 800^{0}C **(1)** • Solder melts / flows round the joint **(1)** **(4 x 1)**	**(4)**
	Total for question	**9**

Question Number	Answer	Mark
2(a)	The following **two** parts of the mechanism clearly shown either in pictorial or symbol form:- • Rack **(1)** • Pinion **(1)**  **(2 x 1)**	**(2)**
2(b)	Any **two** of the following:- • A change in stimulus (temperature/electricity) **(1)** produces a change in shape/movement **(1)** **(2 x 1)**	**(2)**
2(c)	Any **three** of the following with a linked relevant explanation:- • Strength **(1)** in order to withstand high forces without breaking / deforming **(1)** • Heat resistant **(1)** so they do not soften / weaken when in situ **(1)** • Stable **(1)** so that they do not excessively expand with heat causing malfunction **(1)** • Hard **(1)** so that they do not wear away /scratch when in use **(1)** • Lightweight **(1)** increasing efficiency (e.g. fuel saving) **(1)** **(3 x 2)**	**(6)**
	Total for question	**10**

Question Number	Answer	Mark
3(a)	The following answers against the correct letter:- A - Chuck **(1)** B - Tool post / tool mount **(1)** C - Saddle / Carriage / Apron **(1)** D - Tail stock **(1)** (4 x 1)	**(4)**
3(b)	Any **five** of the following points:- • Block clamped to table / clamped in machine vice **(1)** • Cutter selected / fitted into chuck / collet / onto mandrel **(1)** • Table manoeuvred into position **(1)** • Appropriate speed / feed selected **(1)** • Cutter rotates **(1)** • Block fed into cutter **(1)** • References to up milling / down milling **(1)** • Several small cuts taken **(1)** • Cutting fluid applied **(1)** *[Do not award marks for stopping the machine, removing the work or safety issues.]* (5 x 1)	**(5)**
	Total for question	**(9)**

Question Number	Answer	Mark
4(a)	Any **one** of the following :- • Polyester resin **(1)** • Epoxy resin **(1)** • Polyurethane resin **(1)** (1)	**(1)**
4(b)	Any **six** of the following :- • Manufacture the mould **(1)** • Apply release agent / polish / wax to the mould **(1)** • Gel coat mixed/ resin mixed **(1)** • Gel / resin coat applied **(1)** • Add / spray a layer of glass fibre **(1)** • Add a layer of resin / work resin into glass fibre layer **(1)** • Repeat for subsequent layers **(1)** • Allow to set / cure **(1)** • Remove and trim **(1)** (6 x 1)	**(6)**
4(c)	Any **two** of the following with a linked relevant explanation:- • Mould is re-usable **(1)** so multiple mouldings can be produced saving time / money **(1)** • Flexible production rates can be matched to customer demand/made to order **(1)** so no stock holding / storage issues **(1)** • A range of options can be easily catered for **(1)** tailoring the product to client needs (e.g. colour/size) **(1)** • Process is labour intensive / slow / difficult to automate, **(1)** making the development of mass production systems too expensive for market demand. **(1)** (2 x 2)	**(4)**
	Total for question	**11**

Question Number	Answer	Mark
5(a)	Any **six** of the following shown in the sketches or identified in the text:-  • Bottle die **(1)** • Extruder heats parison/ forms parison / preform heated **(1)** • Parison fed in / preform inserted **(1)** • Die closed **(1)** • Air blown in **(1)** • Pressure maintained to fully fit moulding to die **(1)** • Die cooled /water pipes cool die **(1)** • Die opened to release bottle **(1)** (6 x 1)	**(6)**
5(b)	Any **two** of the following with a linked relevant explanation:- • So that the components are made to the correct size / standard (1) ensuring the product fits / functions appropriately (1) • To set up parameters for quality control checks **(1)** ensuring that only correct components will pass **(1)** • So components are not made more accurate than they need to be **(1)** saving time / money **(1)** (2 x 2)	**(4)**
	Total for question	**10**

Question Number	Answer	Mark
6(a)	Any **three** of the following with a linked relevant explanation:- • Mortice and tenon joints give a stronger construction / mahogany is stronger **(1)** due to grain structure that is not present in MDF **(1)** • Mahogany is lighter than MDF **(1)** therefore making the table more portable **(1)** • No veneer is required **(1)** simplifying production / reducing the time / cost needed for manufacture **(1)** • Product is more durable **(1)** as corners / surfaces will not damage as easily **(1)** (3 x 2)	**(6)**
6(bi)	Any **five** of the following:- • Suitable extraction **(1)** • Work fully secured/supported **(1)** • Cutter securely fitted **(1)** • No trailing wires **(1)** • Good lighting **(1)** • Uncluttered floor **(1)** • No distractions **(1)** • Appropriate training **(1)** • Grip router firmly when turning it on (to compensate for the 'kick')**(1)** • Ensure cutter is fully stopped before releasing hold of the router **(1)** (5 x 1)	**(5)**
6(bii)	Any **two** of the following:- • For training **(1)** so that all risks and safe procedures are covered **(1)** • Provides evidence that H&S legislation has been applied **(1)** if accident occurs / HSE inspect / required in court **(1)** • Provides a basis for review **(1)** so that any changes can be built upon existing good practice **(1)** (2 x 2)	**(4)**
	Total for question	**15**

Question Number	Answer	Mark
7	Any **six** from the following :- Advantages • Use of symbol inspires consumer confidence **(1)** • Increased reputation **(1)** • Increased sales **(1)** • Compliance brings a measure of legal protection / standards accepted by law courts **(1)** • Employees have improved working conditions **(1)** • Less employee absence / more motivated employees **(1)** • Increased productivity **(1)** • Reduces after sales costs **(1)** • BSI standards internationally recognized **(1)** • Opens up trade with other BSI recognized businesses **(1)** Disadvantages • High costs of setting up / changing to comply with standards **(1)** • Many consumers do not know the significance of kitemark® **(1)** • Increase the red-tape within business **(1)** *[max 5 from any one area]* (6 x 1)	**(6)**
	Total for question	**6**

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