

Mark Scheme (Standardisation) Summer 2008 Final

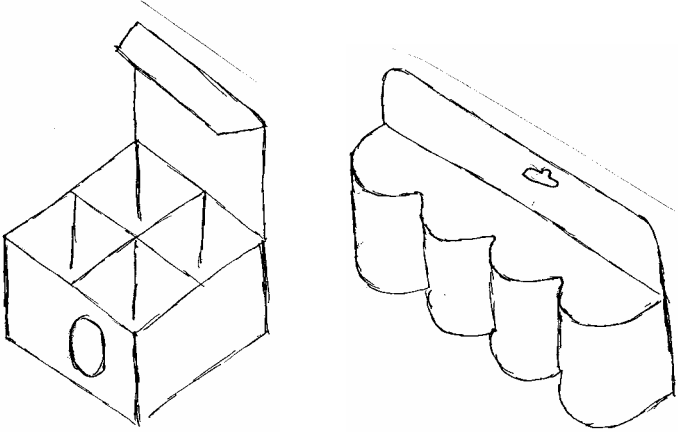
GCE

GCE D&T (6147/01)

General Marking Guidance

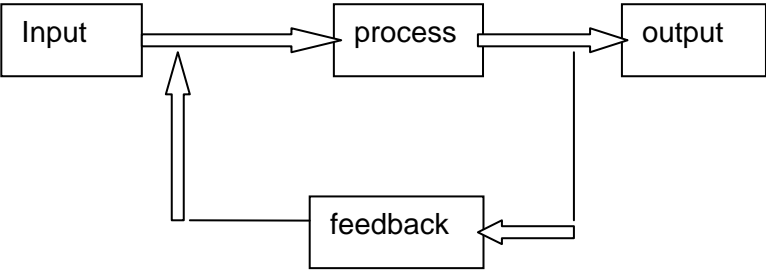
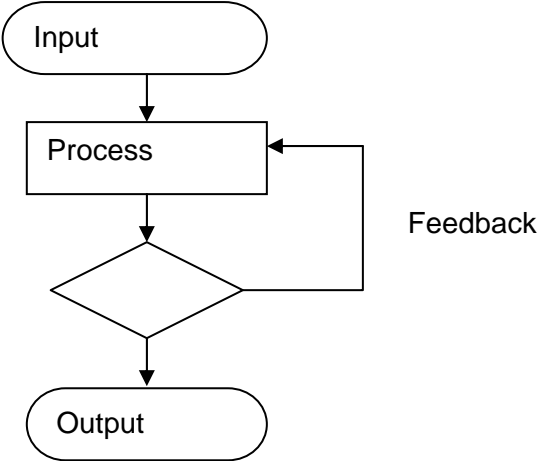
- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should 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.

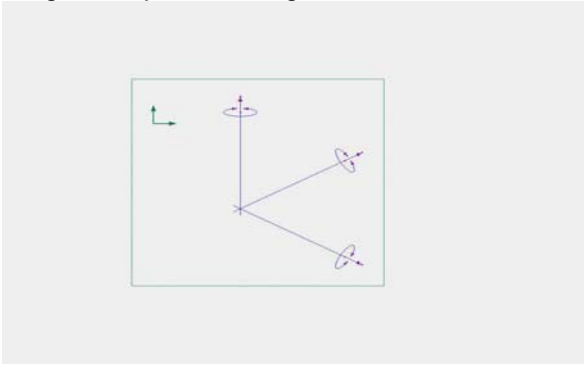
Question Number	Answer	Mark
1(a)	<ul style="list-style-type: none"> • It softens / melts in hot water (1) Can be moulded by hand (1) • Can be reused / reshaped many times (1) Therefore more economical (1) • Easily moulded (1) without wastage (1) • Develops shapes quickly (1) So save time / fast(er)(1) • Testing designs (1) ergonomic (1) • Can be shaped (1) to get a feel for what it would look like (1) <p style="text-align: right;">(2x1)</p>	2
1(b)	<ul style="list-style-type: none"> • Glows in the dark (1) • without additional illumination (1) • Do not require external power sources (1) • Can emit light naturally because the crystals have absorbed light energy (1) • Luminescent (1) • Easily applied (1) <p style="text-align: right;">(2x1)</p>	2
1(c)	<ul style="list-style-type: none"> • Biopol is biodegradable / disintergrate (1) therefore it rots down / reduces landfill / less visual pollution (1) • Biopol is made from food stuffs (1) does not rely on finite resources (1) <p style="text-align: right;">(2x1) (2x1)</p>	4
1(d)	<ul style="list-style-type: none"> • Paper & card can be strengthened by putting folds / crease lines into the design (1) to prevent collapse (1) • Hollow panels (1) such as doors can be strengthened by making a card honeycomb between the outer panels. (1) • Cardboard tubes can be strengthened by multiple layers of spirally wound paper plies (1) glued together with PVA. (1) • Paper & card plies must be allowed to dry before use in construction (1) to avoid deflection or sagging. (1) • Paper & card can be treated with / sprayed with fire retardant liquids (1) to prevent /restrict flames spreading or charring. (1) • To avoid water / moisture absorption from the air (1) specially coated over / sprayed layers can be used (1) • Up to 22 plies can be combined (1) giving thickness of up to 16mm (1). • Layers of board (1) with corrugated layer (1) • Combined with polythene layer (1) to ensure impermeability to water (1) <p style="text-align: right;">(2x1) (2x1)</p>	4
Total for question		12

Question Number	Answer	Mark
2(a)	<p>Marks awarded for the following points shown in diagram</p> <ul style="list-style-type: none"> • Able to see at least one of the light bulbs when the package is closed and on display (1) • The light bulbs safely held in position so that they do not break in transit (1) • The package hold four light bulbs (1) • The packaging suitable for display in shops safely (1) <div style="text-align: center;">  </div> <p style="text-align: right;">(4x1)</p>	4
2(b)	<p>Marks awarded for the following points shown in diagram</p> <ul style="list-style-type: none"> • The poster shows a relevant imagery such as energy conservation or lighting (1) • The poster include suitable text for promoting lifestyle aligned to energy conservation i.e. saving the planet / reduce carbon footprint (1) • The poster promote energy efficient light bulbs with a competitive edge i.e. saving money / longer lasting light bulbs (1) <p style="text-align: right;">(3x1)</p>	3

Question Number	Answer	Mark
2(c)	<p>The adverts must be</p> <ul style="list-style-type: none"> • Legal (1) • Decent (1) • Honest (1) • Truthful (1) • Socially responsible / non offensive to all cultures / age related (1) • Respectful of the principles of fair competition generally accepted in business. (1) <p style="text-align: right;">(3x1)</p>	3
2(d)	<p>Any of the following</p> <ul style="list-style-type: none"> • When buying goods the consumer is protected by various laws (such as The Sale Of Goods Act 1979 / 1994 and Sale of Goods to Consumer Regulations 2002) (1) • The goods are of satisfactory quality / meet standards that a reasonable person would expect (1) • The goods correspond to the description given (1) • Fit for purpose /Free from defects / The goods are suitably durable (1) • Goods are safe to use (1) • If a product is faulty when bought, a customer can use their statutory rights to get their money returned. <p style="text-align: right;">(2x1)</p>	2
Total for question		12

Question Number	Answer	Mark
3(a)	<ul style="list-style-type: none"> • The scanner is linked directly to a central computer which relays the price of the product back to the till (1) so reduces errors at the check out. (1) • it records the sale of an item (1) so keeps track of the stock level (1) • Automatically checks the price of an item (1) and allows for immediate price changes in all stores from central office (1) • Automatically deducts the item from stock (1) allows for immediate knowledge of stock balance (1) • Allows for quicker reordering / can reduce costs / increase profit margins / more efficient (1) by monitoring stock more closely (1) • Can carry out stock check (1) to see if stock is available (1) • Save labour cost / time (1) by customer self scanning items (1) <p style="text-align: right;">(2x1) (2x1)</p>	4
3(b)	<ul style="list-style-type: none"> • Bar codes are read only (1) and cannot send out information / scan product codes for price and stock (1) • RFID tags send out information (1) which enables the company to track the product (1) • RFID tags allow the product to be traced (1) from manufacture right through to disposal (1) • RFID are intelligent bar codes (1) connected to a larger network of information (1) • Bar codes are printed visually (1) RFID are electronic devices, sending out signals (1) <p style="text-align: right;">(2x1) (2x1)</p>	4
3(c)	<ul style="list-style-type: none"> • Schools do not have to spend money on expensive capital equipment (1) It gives pupils the opportunity to use industry standard manufacturing equipment (1) • It allows pupils the opportunity to use professional expertise (1) without leaving school (1) • It allows pupils the opportunity to view industrial processes in action (1) without leaving school (1) • Allows interaction with manufacturers (1) to make changes (1) <p style="text-align: right;">(2x1) (2x1)</p>	4
Total for question		12

Question Number	Answer	Mark
4(a)	<p>Any from the following diagram</p> <p>Correct positioning of feedback (1) Correct positioning of input / start (1) Correct positioning of output / end / finish (1) Correct positioning of process (1)</p> <p style="text-align: right;">(4x1)</p> 	
	<p>Correct positioning of feedback (1) Correct positioning of input / start (1) Correct positioning of output / end / finish (1) Correct positioning of process (1)</p>  <p style="text-align: right;">(4x1)</p> <p><i>Candidates do not have to use the correct shapes but must indicate the stages.</i></p>	4

Question Number	Answer	Mark
4(b)	<ul style="list-style-type: none"> • A closed loop system has feedback built into the system (1) So that the output can be regulated (1) • Allows for a degree of checking / control over the process (1) to obtain the desired output (1) • An open lop system, cannot use feedback (1) so system can run away (1) <p style="text-align: right;">(2x1)</p>	2
4(c)	<p>Any two of the following</p> <p>The amount of robotic linear movement in 3 axes (1) The amount of robotic rotational movement in three axes (1)</p> <ul style="list-style-type: none"> • The end effector on a robot can be positioned to give up to 6 degrees of freedom within the work volume (1) • Three linear and three rotational.(1) • Three degrees of freedom are provided by the operating mechanism (1) • The other two or three by the end effector, depending on how it is configured.(1) • Diagram / pictures e.g. <div style="text-align: center;">  </div> <p><i>If diagram drawn shown above to award maximum mark</i></p> <p style="text-align: right;">(2x1)</p>	2

Question Number	Answer	Mark
4(d)	<ul style="list-style-type: none"> • All the people involved in the design, planning and manufacture (1) get together at the same time to resolve design, planning and manufacture problems (1) • Decisions about quality are made at every stage (1) to ensure that a high quality product is manufactured (1) • Appropriate and realistic specifications are set (1) leading to appropriate quality indicators at both design and manufacturing stages (1) • It also encourages manufacturers and designers to consider the product life cycle (1) by looking at sourcing materials through to disposal (1) • Whole team able to access information at the same time (1) through use of electronic information systems (1) • Gantt charts used to show activities that can run concurrently (1) ensuring time to market can be reduced / ensuring deadlines are met (1) • Different tasks started (1) to come together at the same time (1) <p style="text-align: right;">(2x1) (2x1)</p>	4
	Total for question	12

Question Number	Answer	Mark
5(a)	<ul style="list-style-type: none"> • Unit price is lowered (1) because inputs can be utilised more efficiently. (1) • The work is divided up be into small basic units (1) so less skilled workforce can be used. (1) • Equipment cost can be spread over more units of production (1) which reduces the fixed costs (1) • Raw materials purchased at lower costs (1) through bulk buying. (1) • The concentration of an industry in one area will attract a pool of labour (1) that can be trained to have specialisms needed (1). • A large group of companies in one area can attract a large network of suppliers (1) whose own costs will be lower because of their own economies of scale.(1) • Less skilled workers (1) lower cost (1) <p style="text-align: right;">(2x1) (2x1) (2x1)</p>	6
5(b)(i)	<p><u>Start / completion</u></p> <ul style="list-style-type: none"> • What materials are available (1) • What type of production method will be used (mass, batch etc) / quantity needed (1) • When production must start (1) • How much time is needed for each operation (1) • The latest date that the production must be completed by (1) <p><u>Machinery / processes</u></p> <ul style="list-style-type: none"> • Is the machinery needed for the tasks available (1) • Is any specialist machinery needed? (1) • Is any specialist manufacturing processes needed? (1) • Where quality control should occur (1) • How will quality be checked? (1) <p><u>Scope / labour</u></p> <ul style="list-style-type: none"> • Identifying the scope and detail of the work to be done.(1) • Identifying what labour capacity is required (1) • The required level of skills in the labour available (1) <p style="text-align: right;">(4x1)</p>	4

Question Number	Answer	Mark
5(b)(ii)	<ul style="list-style-type: none"> • A measuring probe / sensors / lasers determines coordinates of points on a work piece surface (1) in all 3 axes / X,Y & Z axes (1) / to check that the work is within tolerance (1) • A measuring probe / sensors / lasers determines coordinates of points on a work piece surface (1) to check measuring the size / alignment (1) <p style="text-align: right;">(2x1)</p>	2
	Total for question	12

Question Number	Answer	Mark
6(a)	<ul style="list-style-type: none"> • Safer disposal of waste (1) Reuse/ recycle waste generated by the production process. (1) • Pollution caused by their manufacturing processes (1) Such as harmful gases / such as noise (1) • More efficient use of energy in the production process (1) Use of alternative power sources / Use of more environmentally friendly power sources • Consideration of materials used (1) / sustainable resourced materials (1) <p style="text-align: right;">(2x1) (2x1)</p>	4
6(b)	<ul style="list-style-type: none"> • There is a limit to the quality (1) that can be achieved with recycled paper (1) • recycled paper will not be bright white (1) and may contain flecks (1) • Reduction in strength / may be weaker (1) every time a fibre is recycled it loses strength (1) • It is not possible to recover all types of paper (1) i.e. laminated paper or glossy surface finish (1) • It can take more energy to collect and process recycled paper (1) than filling traditional land fill sites (1) • Reluctance of people to separate out rubbish / paper (1) for collection (1) • Recycling creates very low skilled jobs (1) poorly paid and dirty (1) • expensive processes (1) as paper has to be sorted and collected (1) • Virgin fibres often have to be added (1) to increase strength and quality (1) • expensive processes (1) as paper has to be bleached and treated (1) <p style="text-align: right;">(2x1) (2x1)</p>	4

Question Number	Answer	Mark
6(c)	<p>References will be made to the following</p> <ul style="list-style-type: none"> • The environment should be seen as an asset, a stock of wealth (1) • Resources are scarce and will run out one day / spaceship earth. (1) • If each generation squanders resources without investing in the future, they will run out one day (1) • Reduce over consumption to protect stocks, for example fishing, forestry (1) • Developed countries need to reduce their use of scarce resources (1) • Developed countries need to reduce their production of pollution (1) • Polluting the atmosphere creates global warming (1) • Polluting the atmosphere can create acid rain (1) • Managing sustainable resources (1) • Developing countries need to reduce / reuse/ renew / recycle (1) • Reduce levels of energy used / invest in renewable energy sources (1) • Moral responsibilities of developed countries (1) <p style="text-align: right;">(4x1)</p>	4
	Total for question	12

Question Number	Answer	Mark
7	<p>NOTE Many points can be argued for and against so read the answer supplied and take this into account.</p> <p>N.B less people needed for manufacturing could be an advantage or a disadvantage. A candidate could argue this in the same answer and must be credited IF the argument makes sense.</p> <p>If only one side of argument used then a maximum of 7 marks available.</p> <p>Advantages</p> <ul style="list-style-type: none"> • It provides employment and higher living standards (1) • It could improve the expertise of the work force(1) • Widens the country’s economic base(1) • It enables the transfer of technology.(1) • Less people needed for manufacturing (1) • Must be able to multi task (1) • Greater efficiency / can work continuously / no need for rest breaks (1) <p>Disadvantages</p> <ul style="list-style-type: none"> • Less people needed for manufacturing (1) • More highly skilled labour force needed(1) • Be more flexible in the way they operate (1) • Higher levels of training, education & ICT skills (1) • Chronic shortage in UK with technician skills (1) • Wider range of basic skills needed (1) • Ability to transfer knowledge (1) • Job for life no longer an option (1) • Must be able to multi task. (1) • Shorter working week may lead to less earnings (1) • Machines can break down (1) • Higher start up cost (1) • Initial set up must be accurate (1) <p style="text-align: right;">(8x1)</p>	8
Total for question		8
Total for paper		80