

# **MARKSCHEME**

**November 2005**

## **DESIGN TECHNOLOGY**

**Standard Level**

**Paper 2**

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## Subject Details: Design Technology SL Paper 2 Markscheme

### Mark Allocation

Candidates are required to answer **ALL** questions in Section A (total 20 marks) **and any ONE** question in Section B (20 marks each). Maximum total = 40 marks.

### General

A markscheme often has more specific points worthy of a mark than the total allows (especially for essay questions). This is intentional. Do not award more than the maximum marks allowed for part of a question.

When deciding upon alternative answers by candidates to those given in the markscheme, consider the following points:

- Each marking point has a separate line and the end is signified by means of a semicolon (;).
- An alternative answer or wording is indicated in the markscheme by a ‘/’; either wording can be accepted.
- Words in ( ... ) in the markscheme are not necessary to gain the mark.
- The order of points does not have to be as written (unless stated otherwise).
- If the candidate’s answer has the same ‘meaning’ or can be clearly interpreted as being the same as that in the mark scheme then award the mark.
- Mark positively. Give candidates credit for what they have achieved, and for what they have got correct, rather than penalising them for what they have not achieved or what they have got wrong.
- Remember that many candidates are writing in a second language; be forgiving of minor linguistic slips. Effective communication is more important than grammatical niceties.
- Occasionally, a part of a question may require a calculation whose answer is required for subsequent parts. If an error is made in the first part then it should be penalised. However, if the incorrect answer is used correctly in subsequent parts then **follow through** marks should be awarded. Indicate this with ‘**ECF**’, error carried forward.
- Units should always be given where appropriate. Omission of units should only be penalised once. Indicate this by ‘**U-1**’ at the first point it occurs. Ignore this, if marks for units are already specified in the markscheme.
- Do not penalize candidates for errors in significant figures, unless it is specifically referred to in the markscheme.

**SECTION A**

1. (a) (i) 1.1 m **OR** 1100 mm; [1]
- (ii) *Award [1] for identifying component diversions and [1] for correct answer.*
- Component dimensions A and B, 800 mm × 1.0 m;  
800 sq mm; [2]
- (iii) \$320; [1]
- (b) (i) *Award [1] for any two methods [2 max].*  
more spokes;  
wider rim;  
wider/tougher tyre; [2 max]
- (ii) *Award [1] each for any two modifications [2 max].*  
replace the mesh with a weather proof / dust proof material;  
such as plywood or canvas or tin;  
partition the trailer into sections with dividers;  
form a cover on the top, either solid and hinged or of fabric; [2 max]
- (c) (i) *Award [1] for the identification of a feature and [1] for a description of why it is not safe.*  
handles;  
no handles to hang on to so may bounce around;  
rear enclosure;  
no rear enclosure so may fall out;  
wheel guard;  
so could get fingers caught in wheels;  
wire mesh floor;  
may bruise; [2 max]
- (ii) *Award [1] for the identification of a modification and [1] for a description of how it would make it safer.*
- handles;  
provide handles on the side to hang on to;  
fill in mesh;  
children not get caught in the mesh;  
cover the holes beside the wheels;  
children not get fingers caught in wheel;  
install a back;  
children would not fall out;  
install a solid/soft base;  
children would not bruise from bouncing on wire;  
install springs on wheels;  
smoother ride for children; [2 max]

2. (a) the mass per unit volume of a material; **[1 max]**
- (b) *Award [1] for the identification of a reason and [1] for each distinct point in an explanation [2 max].*

transportability;  
need to transport and carry packages securely;  
heavier packages cost more to transport;

storage volume;  
product should consume minimum space when stored;  
more space costs more;

contents;  
product must contain the volume of contents adequately;  
must contain the chemistry of the contents;

conservation;  
minimize waste in package design;  
minimize volume of materials used;

**[3 max]**

3. (a) the assessment of the effect a product has on the environment from the initial concept to disposal; **[1 max]**
- (b) *Award [1] for the identification of a method and [1] for each distinct point in an explanation of how harm to the environment is reduced [2 max].*

reuse;  
disassemble components so each can be reused;  
select materials that can be reused;

minimize pollution;  
create less landfill;  
dispose of harmful elements appropriately;

recycling;  
local authorities make it easy to recycle;  
recycle materials;  
facilities established to allow ease of recycling;

**[3 max]**

**SECTION B**

4. (a) (i) moulding; [1]  
(ii) unusual shape;  
strong use of curves; [2 max]  
smooth surface;
- (iii) *Award [1] for any one reason and [1] for explanation.*  
ease of access;  
the rollerball makes the door easier to open;  
ensure stability;  
the rollerball spreads the load evenly;  
reduce load on the hinge;  
otherwise the door would hang from the hinge unsupported; [2 max]
- (b) *Award [2 max] for one piece of legislation suitably outlined.*  
ban on use of CFCs in fridges;  
*i.e.* effect on ozone layer;  
take-back (recycling/re-use) policy;  
so manufacturers are responsible for the disposal of the product; [2 max]
- (c) (i) *Award [1] for any.*  
design costs;  
R&D costs;  
capital costs;  
overheads; [1 max]
- (ii) *Award [1] each for any three.*  
manufacturers produce a range of products;  
with different features;  
and at different prices;  
to give consumers a choice; [3 max]
- (d) user trials would be appropriate for gaining information concerning ergonomics;  
aesthetics;  
and price;  
while performance tests would be appropriate for gaining information concerning energy efficiency;  
noise pollution;  
door mechanism;  
expert appraisal would provide information from people with detailed knowledge/experience of the product or market;  
so the product could be an improvement on previous designs;  
and be targeted at the right market; [9 max]

5. (a) (i) *Award any two [1] each.*  
seating height;  
seat depth;  
size or shape of back support; *[2 max]*
- (ii) 50<sup>th</sup>; *[1]*
- (iii) texture of the seat;  
in relation to comfort of users;  
  
shape of the back support;  
in relation to comfort of users; *[2 max]*
- (b) the form (cross-section) of the seat panels;  
can be extruded easily and cheaply to any length; *[2]*
- (c) (i) batch production; *[1]*
- (ii) plastic and aluminium are readily available materials;  
easily/quickly moulded into shape so cheap to use;  
and would be a low cost to the final cost of the product; *[3]*
- (d) metal chosen because it has high tensile strength;  
is tough;  
ductile;  
hard;  
stiff;  
plastic chosen because it is tough;  
both materials are resistant to moisture (rain);  
variations in temperature;  
for cleaning, both materials have good resistance to chemicals;  
hosing down with water;  
have wipe clean surfaces; *[9 max]*

6. (a) (i) *Award [1] for any two.*

hard;  
ductile;  
tough;  
good tensile strength;  
stiff;

*[2 max]*

(ii) *Award [1] for any one advantage and [1] for suitable description.*

ease of manufacture;  
the strips can be woven either by craft means or by machine;

aesthetics;  
it looks traditional;  
looks like a basket woven from cane;

durability;  
weaving adds to strength;  
water can escape;

*[2 max]*

(b) the idea for the design of the bin has been adapted from the traditional basket weaving technique;  
used to make wicker baskets;

*[2]*

(c) (i) the bin will be quite heavy;  
so it will not be very portable;  
and without the use of a bin liner litter will easily become trapped and make it difficult to keep clean;

*[3]*

(ii) it is heavy so will not be blown over easily;  
no sharp edges to the handles;

*[2]*

(d) the bin would be quite expensive to make;  
as it would require either a considerable amount of craft skills;  
and hence manual labour;  
or expensive machinery;  
different sizes of metal have been used for the top and bottom parts;  
and the weave is not in a standardized form throughout the product which increases cost of manufacture;  
in addition there are separate components to be manufactured and joined together such as the base;  
and the handles;  
there will not be a large market for an expensive bin;  
or one which looks so unusual;

*[9 max]*

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