



MARKSCHEME

November 2008

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.

1. A markscheme often has more marking points than the total allows. This is intentional. Do **not** award more than the maximum marks allowed for part of a question.
2. Each marking point has a separate line and the end is signified by means of a semicolon (;).
3. An alternative answer or wording is indicated in the markscheme by a slash (/) – either wording can be accepted.
4. Words in brackets () in the markscheme are not necessary to gain the mark.
5. Words that are underlined are essential for the mark.
6. The order of marking points does not have to be as in the markscheme, unless stated otherwise.
7. If the candidate's answer has the same "meaning" or can be clearly interpreted as being of equivalent significance, detail and validity as that in the markscheme then award the mark. Where this point is considered to be particularly relevant in a question it is emphasized by writing **OWTTE** (or words to that effect).
8. Remember that many candidates are writing in a second language. Effective communication is more important than grammatical accuracy.
9. Occasionally, a part of a question may require an answer that is required for subsequent marking points. If an error is made in the first marking point then it should be penalized. However, if the incorrect answer is used correctly in subsequent marking points then **follow through** marks should be awarded. Indicate this with **ECF** (error carried forward).
10. Only consider units at the end of a calculation. Unless directed otherwise in the mark scheme, unit errors should only be penalized once in the paper. Indicate this by writing **-1(U)** at the first point it occurs and **U** on the cover page.
11. Do not penalize candidates for errors in significant figures, unless it is specifically referred to in the markscheme.

SECTION A

1. (a) (i) £10 MW/hr; [1]
- (ii) *Award [1] for any two reasons.*
abundant supplies in many parts of the world;
relatively cheap to use;
not technologically difficult to convert coal into electricity;
tradition – has been used for many years; [2 max]
- (b) (i) *Award [2] for*
it is competitively priced;
and does not produce emissions; [2]
- (ii) *Award [2] for a suitable outline along the lines of:*
cost;
higher energy prices may affect demand;

global economy;
growth or decline in industry affects demand for energy;

politics;
governments may have differing energy policies;

environment;
changes in climate affect demand for energy;

resources;
amount and availability affects supplies;

use;
the amount and type used will affect supply; [2 max]
- (iii) *Award [2] for*
not much difference in costs between gas, nuclear and coal;
but wind is much more expensive;
renewables are more expensive; [2]
- (c) *Award [1] for each aspect.*
offshore is more expensive because of the higher capital costs of building wind turbines at sea;
also higher cost of distributing the electricity generated to land;
and higher maintenance costs due to the effect of the sea water; [3]

2. (a) “A mechanical device controlled by computer that can perform human-like tasks”. [1]
- (b) *Award [2] for one disadvantage.*
no flexibility in use;
as cleans a programmed route;

does not use attachments;
e.g. for cleaning stairs etc.;
- more expensive to buy than a conventional vacuum cleaner;
and higher maintenance costs if it breaks down;
- operating skills;
need to learn how to programme and operate the robot; [2 max]
3. (a) *Award [2] for either outline along the lines of*
manufacturers may be reluctant to spend money cleaning up a manufacturing process;
but legislation may force them to do it;
- manufacturers may anticipate forthcoming legislation;
and be pro-active in taking action before being forced to do so; [2 max]
- (b) *Award [1] for any of*
consumers can see the energy use of the product;
“green” consumers can decide if the product satisfies their criteria for purchase;
consumers can compare energy ratings of different products; [1 max]
4. *Award [2] for something along the lines of*
ductility is when a metal is extruded or drawn into a wire/tube;
while malleability is the shaping of sheet metal by pressing/forming/hammering; [2]

SECTION B

5. (a) (i) *Award [2] for either answer.*
aesthetics;
to make it look more attractive;
- OR**
- feels nice;
- portability;
to prevent the corners being damaged in transit; *[2 max]*
- (ii) *Award [1] for a reason and [1] for more detail.*
portability;
to make it easier to carry around;
and to protect the controls;
- aesthetics;
to conceal the control panel;
and so make it more decorative in the home;
- storage;
easily stored away or can be stacked; *[2 max]*
- (iii) *Award [1] for a reason and [1] for each further point [2 max]*
- black and white are neutral colours;
which will blend with other colours in the radio's environment;
but orange is a vibrant colour which would be chosen by consumers if
they wanted the radio to stand out;
- a limited range of colours is economically good for manufacturers;
as they only have to batch produce the radios in three colours;
and hence are unlikely to be left with many unsold radios;
- in 1963 many products were only produced in a limited colour range;
and as the radio originated from that time and has been selling
for over 40 years;
the manufacturers may have decided to keep the limited colour range
as part of the image; *[3 max]*
- (b) (i) *Award [2] for*
mature;
as the product does not change but sales are still strong; *[2]*
- (ii) *Award [1] per distinct point in an outline.*
thermoset plastic can be moulded;
which makes the shape of the casing easy to produce;
colour can be introduced into the moulding process;
which makes it cost-effective to produce the colour range; *[2 max]*

- (c) *Award [1] for the reason and [1] for each further point, [2 max] for each of three reasons.*

simple geometric shape;
which fits in with many styles of environment;
and does not date;

durable design;
because of the folding mechanism;
so less planned obsolescence;

novelty item;
which has eye appeal;
and is not aimed at a particular age group;

no surface decoration;
which may link it with a particular fashion;
and cause it to become outdated;

radios continue to sell well;
in a global marketplace;
so there is a continuous need for such a product;

[9 max]

6. (a) (i) *Award [1] for the reason and [1] for further detail*

to be used in the gym so must not damage easily;
and metal is a durable material which would help protect the
electronic components;

it needs to be water resistant;
and metal does not absorb water;

it is a contemporary design;
and gleaming metal emphasises this image;

[2 max]

- (ii) extrusion;

[1]

- (b) (i) *Award [1] for the performance test and [1] for further detail.*

durability test;
to test it to destruction;

vibration test;
to test if it's suitable for using at the same time as using
gym equipment;

watertight test;
to test it's resistance to moisture for the gym environment;

[2 max]

- (ii) *Award [1] for each distinct point in a suitable explanation.*

must be easy to use in the dynamic situation of the gym;
shaking it three times to change the mode is easy to do while on the move;
the one – line display is easy to read at a glance;
it's shape (or smooth surface) means it will not snag on clothing (or scratch
the skin);
minimum amount of controls;
all controls are easy to use with one hand;

[3 max]

- (c) *Award [1] for each distinct point in a suitable explanation.*

contemporary style, smooth (uncluttered) surface;
polished metal body the only surface decoration;
modern colour;
simple geometric shape;

[3 max]

- (d) *Award [1] for the aspect and [1] for each further point [2 max] for each of
three aspects.*

battery;
rechargeable;
but will not last indefinitely as constant charging reduces its lifespan;

used in the gym environment so could easily get damaged;
by leaving it on a bench or dropping it *etc.*;
or could be left in the changing room;

sensitive electronic components (sensors);
so could be damaged by excess vibration;
or prolonged exposure to moisture;

competitive market for electronic products;
so much R&D takes place;
which obsolesces previous products;

[9 max]

7. (a) (i) fasteners/adhesives;
joints; [2]
- (ii) *Award [1] for the reason and [1] for a further point.*
aesthetics;
pattern of the grain;
and colour;
- durability;
tough
and strong;
- quality;
long lasting;
and good image;
- maintenance;
easy to clean;
and to sand (abrade) to restore; [2 max]
- (b) (i) *Award [1] for the design consideration and [1] for a further point.*
hard;
so it will not scratch easily;
- heat resistant;
so it will not be marked by hot cups *etc.*;
- waterproof;
so it will resist deterioration due to the weather;
- transparent;
so the grain of the timber shows; [2 max]
- (i) *Award [1] for the issue and [1] for each further point [2 max].*
hardwood is durable;
so if it gets scratched *etc.*;
it can be repaired by abrading;
- fasteners are used to join the parts;
so if one part becomes damaged;
it can be replaced with a new part;
- the surface finish may become worn or damaged;
but it can be abraded;
and re-finished;
- the chair construction is simple to understand;
so repair is possible without having to transport it back to
the manufacturer;
which makes it economical to do; [3 max]

- (c) *Award [1] for batch and [1] for a further point*
sells in a major chain store so there is a need for a large quantity;
but it is not a continuous flow market;
consumers want choice; *[2 max]*
- (d) *Award [1] for the ergonomic consideration and [1] for each further point [2 max]*
for each of three ergonomic considerations.
- safety;
rounded corners;
to prevent snagging on clothes;
or damage to the body;
- smooth texture;
to make it more comfortable to sit on (or handle);
and to prevent splinters;
- slots in the backrest;
to make it easier to pick up;
and they are big enough for a hand to fit in;
- curved seat front;
to make it more comfortable;
and to grip easily when folding the chair;
- when folding the chair;
the mechanism is away from the hands;
so avoids finger traps;
- density of timber;
light enough to pick up;
carry around or stack; *[9 max]*
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