N09/4/DESTE/SP2/ENG/TZ0/XX/M

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MARKSCHEME

November 2009

DESIGN TECHNOLOGY

Standard Level

Paper 2

12 pages

If you do not have a copy of the current Design Technology Guide, please request one from IB Cardiff.

General Marking Instructions

Assistant Examiners (AEs) will be contacted by their team leader (TL) by email (or telephone) – if by email, please reply to confirm that you have downloaded the markscheme from IBIS. The purpose of this initial contact is to allow AEs to raise any queries they have regarding the markscheme and its interpretation. AEs should contact their team leader by email at any time if they have any problems/queries during the marking process.

Note:

The DHL courier service must be used to send assessment material to your team leader/senior moderator and to IB Cardiff. (However, this service is not available in every country.) The cost is met directly by the IBO. It is vitally important that the correct DHL account number is used.

If you have any queries on **administration** please contact:

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1. Follow the markscheme provided, award only whole marks and mark only in **RED**.

2. Where a mark is awarded, a tick/check (✓) **must** be placed in the text at the **precise point** where it becomes clear that the candidate deserves the mark. **One tick to be shown for each mark awarded.**

3. Sometimes, careful consideration is required to decide whether or not to award a mark. In these cases write a brief annotation to explain your decision. You are encouraged to write comments where it helps clarity, especially for moderation and re-marking. It should be remembered that the script may be returned to the candidate.

4. Unexplained symbols or personal codes/notations are unacceptable.

5. Record marks in the right-hand margin against each mark allocation shown in square brackets *e.g.* ***[2]***. The total mark for a question must equal the number of ticks for the question.

6. Do **not** circle sub-totals. **Circle the total mark** for the question in the right-hand margin **at the end of the question.**

7. Where an answer to a part question is worth no marks, put a zero in the right-hand margin next to the square bracket.

8. Where work is submitted on additional sheets the marks awarded should be shown as ticks and a note made to show that these marks have been transferred to the appropriate square bracket in the body of the script.

9. Section A: Add together the total for each question and write it in the Examiner column on the front cover.
Section B: Insert the total for each question in the Examiner column on the front cover.
Total: Add up the marks awarded and enter this in the box marked TOTAL in the Examiner column on the cover sheet.

10. After entering the marks on the front cover check your addition to ensure that you have not made an error. Check also that you have transferred the marks correctly to the cover sheet. **All scripts are checked and a note of all clerical errors will be given in feedback to examiners.**

11. If an answer extends over more than one page and no marks have been awarded on a section draw a diagonal line through that section to indicate that it has been marked.

12. If a candidate has attempted more than the required number of questions within a paper or section of a paper, mark all the answers and use the marks of those answers that have the highest mark, **unless the candidate has indicated the question(s) to be marked on the front cover**.

13. A mark should not be awarded where there is contradiction within an answer. Make a comment to this effect in the left hand margin.

Subject Details: Design Technology SL Paper 2 Markscheme

Mark Allocation

Candidates are required to answer **ALL** questions in Section A (total 20 marks) **ONE** question in Section B [20 marks]. 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 penalise candidates for errors in significant figures, unless it is specifically referred to in the markscheme.

SECTION A

1. (a) (i) *Award **[1]** for interpretation of the table.*
cement; ***[1]***

(ii) *Award **[1]** for the answer including units.*
$6 \times 15 = 90\ m^2$; ***[1]***
No marks without units.

(iii) *Award **[1]** for calculation and award **[1]** for the answer including units.*
$(3 \times 50) + 15$;
$= 165\ mm$; ***[2]***

(b) (i) *Award **[1]** per distinct point in a description along the lines of:*
the honeycombing and solid panel cover;
trap the air and form a barrier; ***[2]***

(ii) *Award **[1]** for a method and **[1]** for an outline of it.*
waterproofing;
stop it getting wet and collapsing;

fireproofing;
cardboard is flammable and will ignite easily; ***[2 max]***

(c) (i) *Award **[1]** for a disadvantage.*
only lasts 20 years;
easily damaged;
protective finish needs to be regularly maintained;
image – low quality; ***[1 max]***

(ii) *Award **[3 max]** for one reason.*
cost;
cheaper to buy than most construction materials;
cheaper to manufacture;

ease of manufacture;
can be formed into any shape;
can be easily cut/joined;
lightweight so easy to handle;

maintenance;
easy to replace panels;
easy to apply a finish; ***[3 max]***

2. (a) *Award **[1]** for an advantage.*
shows the object in 3D;
easy to understand;
easy to construct;
same scale along each axis; ***[1 max]***

(b) *Award **[1]** per distinct point in a discussion along the lines of:*
is an elaboration of attribute listing;
make a list of attributes in a table;
consider new opportunities;
the goal is to create new ideas; ***[3 max]***

3. (a) *Award **[1]** for:*
the design contains those implicit features of a product that are recognised as essential by a majority of manufacturers and purchasers; ***[1]***

(b) *Award **[3 max]** for one barrier.*
competition;
from local, national, global companies;
thus market share is smaller;

marketing;
need to advertise;
to gain exposure;

product launch;
can be expensive;
may not get to the desired market; ***[3 max]***

SECTION B

4. (a) (i) *Award **[1]** for:*
a mixture composed of two or more substances (materials) with one substance acting as the matrix or glue; ***[1]***

(ii) *Award **[2]** for:*
hardness;
will not scratch easily; ***[2]***

(iii) *Award **[1]** for one reason and **[1]** for a point in a description.*
safety;
the glass will not shatter;

strength;
improve impact strength; ***[2 max]***

(b) (i) *Award **[1]** for:*
batch production; ***[1]***

(ii) *Award **[1]** for each point in a brief discussion.*
the LEDs are a radical style/aesthetics addition;
but the practical function of the table has not changed;
which is an incremental development; ***[3 max]***

(c) (i) *Award **[1]** for identifying a target market and **[1]** for an outline of it.*
lifestyle;
trendy looking;
new so it is faddish;

entertaining;
aesthetically pleasing;
the table is the centre of attention; ***[2 max]***

(ii) *Award **[1]** for each reference pertaining to the table **[3 max]** in each of three explanations.*
purchase:
aesthetics;
performance;
cost;

initial use:
performance;
ease of use;
ease of maintenance;

long term use:
ease of maintenance;
durability;
ease-of-repair/change the LEDs; ***[9 max]***

5. (a) (i) *Award **[1]** for one advantage stated.*
lightweight;
will not rust;
colour availability;
tough; ***[1 max]***

(ii) *Award **[1]** for a reason and **[1]** for a justification.*
toughness;
absorbs impact;
will not crack easily;

density;
lightweight;

manufacturability;
can be mass produced economically; ***[2 max]***

(iii) *Award **[1]** for way and **[1]** for a description.*
permanent joining;
it makes it difficult to separate for repair/recycling; ***[2 max]***

(b) (i) *Award **[1]** for:*
automation/assembly line; ***[1 max]***

(ii) *Award **[1]** for a reason and **[1]** for each point in a explanation.*
using local labour;
paying local wages;
cheaper than paying for expensive robots;

using standard sub-assemblies;
reduced labour hours in manufacturing;
thus more efficient manufacturing process;

using more plastic;
cheap to manufacture;
cheaper than steel; ***[3 max]***

(c) (i) *Award **[1]** for identifying a test and **[1]** for a reason.*
materials testing;
test for durability/performance;

safety;
collect quantitative data without harming humans in a crash test;

comfort;
you can test for the fit of the seatbelt/try different settings/tightness; ***[2 max]***

(ii) *Award **[1]** for each point in a brief discussion **[3 max]** of three disadvantages.*
cheap product which is available to more people;
use more fuel;
depletes energy resources/causes more pollution through emissions;

volume production of the car;
use of more materials;
use of more energy resources;

disposal of the car;
will produce more waste;
problems with landfill;

cheap product;
probably uses non-recyclable plastics to reduce costs;
plastic waste from manufacturing and disposal a big environmental hazard; ***[9 max]***

6. (a) (i) *Award **[1]** for stating any one property.*
stiffness;
tensile strength; ***[1 max]***

(ii) *Award **[1]** for one reason and **[1]** for a description.*
readily available;
standard sizes;

cost;
cheap to buy;

manufacture;
easily made into required shape;
aesthetics;
different finishes can be applied; ***[2 max]***

(iii) *Award **[1]** for an advantage and **[1]** for each point.*
maintenance;
easily cleaned;

aesthetics;
wide variety of colours;
texture;
smooth surface;

protection;
from water and other substances; ***[2 max]***

(b) (i) *Award **[1]** for:*
the relationship of what a product is worth for the cash amount paid for it; ***[1]***

(ii) *Award **[1]** for an aspect and award **[1]** for each point in an explanation.*
scale of production;
volume produce;
use of standard components;

flat pack;
not assembled at factory;
assembled by the customer at home;
simple design;
not many components; ***[3 max]***

(c) (i) *Award **[1]** for strategy and award **[1]** for each point.*

design for assembly;

the shelves and rods are designed for ease-of-assembly by the consumer;

design for disassembly;

when no longer wanted can be pulled apart easily and disposed/reused; ***[2 max]***

(ii) *Award **[1]** for one strategy and **[2]** for each point in a explanation for three strategies.*

reuse;

can be used for storing other articles apart from books *e.g.* in a garage;
the wooden shelves could be used in a different application;

repair;

has standard parts;
so components can be replaced;

recondition;

if shelves become scratched;
they can be repainted;

the gum comes off the rods;
can be re-dipped;

recycle;

the materials of wood and steel;
can be easily and economically recycled; ***[9 max]***