



MARKSCHEME

November 2007

DESIGN TECHNOLOGY

Higher Level

Paper 3

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Subject Details: Design Technology HL Paper 3 Markscheme

Mark Allocation

Candidates are required to answer **ALL** questions in each of **TWO** Options (total *[20 marks]*). 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.
- Words that are underlined are essential for 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 penalise candidates for errors in significant figures, unless it is specifically referred to in the markscheme.

Option D — Food technology

- D1.** (a) *Award [1] for each point in a list of foods [2 max].*
meat;
poultry;
fish;
milk;
dairy products; *[2 max]*
- (b) *Award [1] for each distinct point in an explanation [3 max].*
pyramid shape represents food intake;
less of the foods at the top should be eaten;
more of the foods at the base should be eaten; *[3 max]*
- D2.** *Award [1] for the selection of a food and [1] for the reason it is essential [2 max].*
vegetables / bread / cereal / fruit;
essential because it helps prevent bowel and intestinal diseases; *[2 max]*
- D3.** *Award [1] for the identification of any two points [2 max] total.*
cut surface damages cells;
enzymes oxidize the phenolic substances;
browning occurs; *[2 max]*
- D4.** *Award [1] for each of two points in an outline [2 max].*

selective breeding of animals;
 resulted in increased yield and quality;

genetic modification of seed crops;
 drought resistant;
 higher yield;
 pest resistant; *[2 max]*

D5. Award **[1] each** for the selection of three ways **[3 max]** and **[2]** for each distinct point in an explanation of each way **[6 max]**. **[9 max]** in total.

food storage **[3 max]**;

- correct temperature controls;
- design for ease of storage access;

preparation areas **[3 max]**;

- non porous materials;
- easy to keep clean;

systems of food movement **[3 max]**;

- separation of foods which may have contamination effect;
- system for tracking date of freshness for foods;

separation of activity areas **[3 max]**;

- food delivery separate from cooking;
- preparation separate from washing utensils;

[9 max]

Option E — Computer-aided design, manufacture and production

E1. (a) *Award [1] for the identification of each reason [3 max].*
reproduction is exact/accurate;
shape is complex;
many similar shapes involved in the design (repetition);
easy to change the design;
allows for 3D visualization; **[3 max]**

(b) *Award [1] for each point in an outline [2 max].*
they are complex;
they are CAD designed;
shapes are repeatable;
faster production; **[2 max]**

E2. *Award [1] for an understanding of CIM and [1] for a reason [2 max].*
CIM [1]
not a CIM system because it is not at the manufacturing stage;
it is not yet a product;
does not involve the total integration of all production aspects;

reason [1]
the CNC router is used as part of the design process;
materials for final product not decided; **[2 max]**

E3. *Award [1] for identifying each reason [2 max].*
people want individualized products;
people are willing to pay the higher cost for one-off products;
some consumers are becoming more discriminating;
higher status is linked with craft products;
craft production may result in higher quality goods. **[2 max]**

E4. *Award [1] for stating an advantage and [1] for an elaboration [2 max].*

coverage;
satellites cover the entire globe;
provide coverage in areas other systems don't;

cost;
less expensive service than some other systems;

band width;
broadband is available; **[2 max]**

E5. Award [1] for the identification of each strategy [3 max] and [2] for each distinct point in a discussion of the three strategies [6 max]. [9 max] in total.

design for materials;

- use materials for more than one process;
- minimize material handling;

design for process;

- minimize handling;
- use standard sub-assemblies;
- minimize component variation;

design for assembly;

- minimize number of parts;
- use standard components;
- design parts which are multi functional;
- design parts for ease of fabrication;

[9 max]

Option F — Invention, innovation and design

F1. (a) *Award [1] for each distinct point [2 max].*

hardwearing;
durable and long lasting;

multi-purpose;
could be worn for many purposes;

value for money;
originally they were good value;

[2 max]

(b) *Award [1] for each point in an explanation [3 max].*

market pull
miners wore out their pants quickly;
pockets ripped easily;
demand for a solution to these problems;

[3 max]

F2. *Award [1] for each point in a list [2 max].*

range of types of denim (faded, stone washed, coloured);
other denim clothes (skirts, jackets);
range of jeans styles (straight, flared);

[2 max]

F3. *Award [1] for each point in a description [2 max].*

the material was imitated in other types of clothing;
cheaper versions of the original were manufactured and sold;
other companies capitalized on Levi's initial R&D;
other companies capitalized on the strong original market for jeans;

[2 max]

F4. *Award [1] for the identification of a reason, and [1] for a description [2 max].*

design is flexible;
design can be changed to suit a market;

evolved into a product family;
skirts / jackets / shirts;

[2 max]

F5. Award [1] each for the identification of three reasons and [1] for each distinct point in an explanation of each reason [2 max]. [9 max] in total.

risk; [3 max]

risk of failure is high;
costs of failure are high;

diverse market; [3 max]

research needed because many different market characteristics;
range of cultural traditions to become aware of;
various income levels in the market;

attitudes and fashions; [3 max]

diverse range of attitudes in different countries;
fashions vary from country to country;

legislation; [3 max]

legislation varies between countries;
import duties and taxes vary;
standards and safety requirements may vary;

[9 max]

Option G — Health by design

G1. (a) *Award [1] for each point in an advantage [2 max].*

cleanliness;

so less likely to cause irritation or illness;
no need for messy cleaning fluids;

upgrade lens;

new supply can be an upgraded prescription;
no extra cost for upgrading;

convenience;

no storage requirements;
easy to care for;

availability;

widely available;
readily available;

[2 max]

(b) *Award [1] for each distinct point [3 max].*

fashion

eye colour can match clothing;
possible to change lens colour;
can combine prescription with fashion;
range of colours available;
choose as a fashion accessory;

[3max]

G2. *Award [1] for a distinct point about soft and [1] for a distinct point about hard in a comparison [2 max]*

soft are more fragile;
hard last longer;

soft need replacing more often;
hard are more durable;

[2 max]

G3. *Award [1] for the identification of each specific reason [2 max].*

any one material is not necessarily biocompatible with all applications;
a material in one application may not be safe for another;

[2 max]

G4. Award [1] for each of *two* points of importance for CAD/CAM [2 max].

accuracy;

need for each lens to be accurate;

volume production;

high volume production keeps the cost down;

specifications;

easy to change lens specifications;

repeatability;

the manufacture of each lens can be repeated exactly;

[2 max]

G5. Award [1] for the identification of up to [3] benefits in each area. [9 max] in total.

computer;

assist speech;

enables people to communicate who otherwise could not;

assist disabled to control their environment;

expands working opportunities for disabled;

hearing aid;

assist hearing;

electronics designed to suit the individual needs;

selectively block out background noise;

selectively amplifies bands of frequencies;

prostheses;

powered prosthetics assist in limb movement;

enable more natural scope of movement;

enable people to engage in a fuller range of activities;

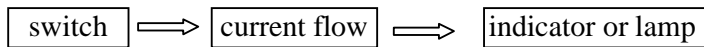
[9 max]

Option H — Electronic products

H1. (a) Award [1] for each correct symbol [2 max]



(b) Award [1] for identifying each of the three components – input or power, process or indicator and output or light [3 max].



[3 max]

H2. Award [1] for each point in a description [2 max].

sensory input mechanism senses temperature;
feedback to control the heating;
temperature parameters often set manually;

[2 max]

H3. Award [1] for each distinct point in a description [2 max].

two terminal device;
lets current pass in one direction only;

[2 max]

H4. Award [1] for each point [2 max].

satellite has a delay in transmission;
so is slower;

[2 max]

H5. *Award [1] each for the identification of three benefits [3 max] and [1] for each distinct point in a discussion of the three benefits [6 max] [9 max] in total.*

user;

- more convenient;
- more secure;
- consolidation of many cards to one or a few;

manufacturer;

- update existing cards remotely;
- fewer cards in circulation;
- reduces costs;

marketer;

- easy to market because of benefits to supplier;
 - easier to market because of benefits to user;
 - state of the art transaction technology easier to market than older technologies; [9 max]
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