

MARKSCHEME

November 2001

DESIGN TECHNOLOGY

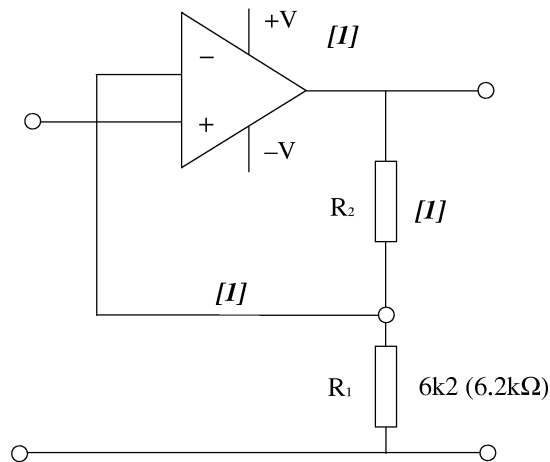
Standard Level

Paper 2

SECTION A

1. (a) (i) Award [**1 max**] for ‘height of the support frame’;
- (ii) Award [**2 max**] for correct area, *i.e.* $2\text{ m} \times 2\text{ m} = 4\text{ m}^2$
or $2000\text{ mm} \times 2000\text{ mm} = 4\,000\,000\text{ mm}^2$;
Award [**1**] for correct length or breadth only;
Award no marks if units are missing;
- (b) Award [**1**] for each correct statement up to [**2 max**]
- floor surface;
 - desk texture;
 - stability of the structure;
 - safe surface and edges (no sharp projections);
 - light requirements;
 - heat requirements;
- (c) Award [**1**] for each correct statement up to [**2 max**]
- surface finish;
 - colour match to proposed or existing decor;
 - resistance to staining;
 - resistance to abrasion;
 - resistance to damp conditions (spilt coffee);
- (d) Award [**1**] for each correct statement up to [**2 max**]
- more complex geometry;
 - more material required;
 - more expensive to manufacture;
 - more design overheads;

2. (a) Award **[1 max]** for correct answer of + 10;
- (b) Award marks as shown for correct diagram up to **[4 max]**



Award **[1]** for value of R2;

Calculated as follows:

$$\text{Gain} = 1 + \frac{R_2}{R_1};$$

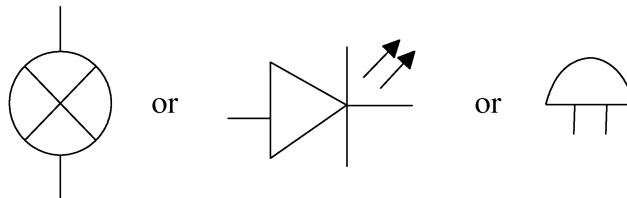
$$10 = 1 + \frac{R_2}{6.2 \text{ k}\Omega} \rightarrow x = 6.2 \text{ k}\Omega \times 9;$$

(Accept 56 kΩ as preferred value) or = 55.8 kΩ;

3. (a) Award up to **[1 max]** for:
- speed of recording ideas;
 - changes made rapidly;
 - captures spontaneous ideas;
- (b) Award **[1]** for each up to **[2 max]**
- package ‘steers’ the designer;
 - aesthetics not easily dealt with in CAD;
 - harder to use creatively;
 - not good at encouraging divergent thinking and generating ideas;
4. (a) Award up to **[1 max]** for definition:
‘A small scale production process centred on manual skills’;
- (b) Award **[1]** for each of the following up to **[2 max]**
- durability (it will not wear out);
 - high intrinsic value;
 - heirloom potential;
 - sentimental value;
 - not to do with style, trend or fad;

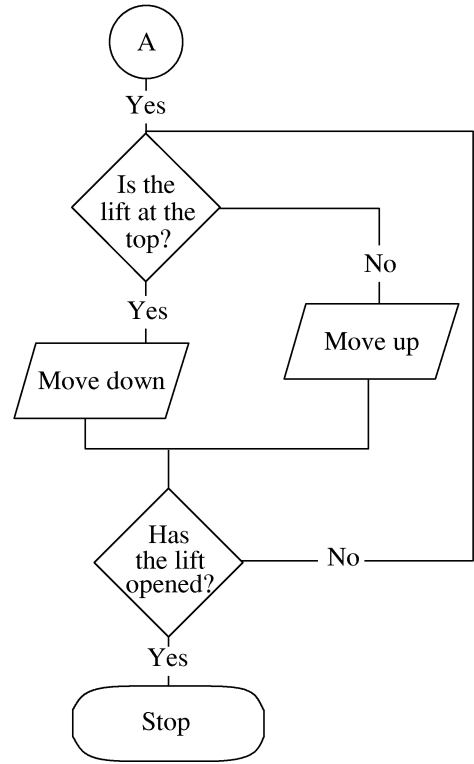
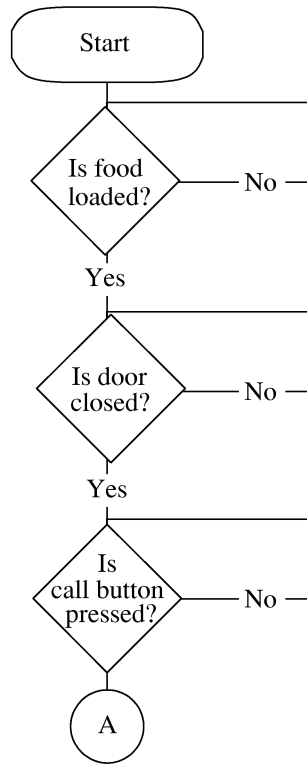
SECTION B

5. (a) (i) Award [**1 max**] for either :
- bulb or light source;
 - LED (Light Emitting Diode);
 - electric bell;
- (ii) Award up to [**1 max**] for recognisable diagram corresponding to device selected by the candidate in (a) (i).



- (b) Award [**1**] for each appropriate issue that is described [**2**] per issue [**6 max**]
- lift must not move if obstructed;
 - lift should not move with the door open;
 - lift should move smoothly to prevent food spillage;
 - if an arm of a worker or a food item is in the way the lift should not be able to move, otherwise injury could result;
 - if the door can close before the lift moves then no obstruction is possible;
 - if the lift moves jerkily or accelerates too quickly then spillage can occur. The motor control must allow 'soft start/soft stop' to prevent this;

(c) Award marks as allocated up to [9 max].



Award [2] for abstracting the correct information

Award [3] for the correct sequence

3–5 correct feed back loops [3]

1–2 correct feed back loops [1] only

Award [1] for correct symbols used

(N.B. could be drawn in on one line, therefore (A) not required)

[3] available for the clarity, logic of the arguments and the quality of the answer *i.e.* use of graphs, charts, table *etc.*

6. (a) (i) Award up to **[1 max]** for ‘scale model’;
- (ii) Award **[2]** for each correctly identified up to **[2 max]**
- light levels;
 - fire doors (exits, entrance);
 - number of windows, doors;
 - minimum construction quality;
 - heat loss through walls, doors, windows *etc.*;
- (b) (i) Award **[1]** for each correct strategy stated up to **[2 max]** plus up to **[2 max]** for logical argument
- published data / literature survey;
 - performance tests;
 - user trials;
 - expert appraisal;
- (ii) Award **[1]** for each correct criterion up to **[2 max]**
- resistance to shock damage;
 - resistance to abrasion damage;
 - non-slip surface;
 - easily cleared;
 - not easily damaged;
- (c) Award marks as allocated up to **[8 max]**, up to **[4]** for discussing the issues as follows:
- space demands;
 - exit / entry requirements in case of emergency;
 - facilities’ requirements, *i.e.* toilets, seating, refreshments, *etc.*;
 - legal requirements to cover non-participants;
 - heating - players will get hot, spectators may need additional heating, could use glass to segregate areas;

Award **[4]** for the construction of a part specification covering these issues.

[3] available for the clarity, logic of the arguments and the quality of the answer *i.e.* use of graphs, charts, table *etc.*

7. (a) (i) Award [**1 max**] for the definition:
 ‘The application of scientific information concerning the relationship of human beings to the design of objects, systems and environments.’
- (ii) (a) Award [**1**] for each issue identified up to [**2 max**]
- sharp edges created when opened A, B;
 - food contamination from faulty joining A, B, C;
 - possible danger of cutting hand while opening B;
 - food spillage while opening A, B, C;
- (b) Award [**1**] for each issue identified up to [**2 max**]
- needs tool to open C;
 - does not need a tool to open it B, A;
 - not possible to see the contents B; C;
 - difficult for arthritic person to open C;
- (b) Award [**1**] for each suggestion up to [**3 max**]
- appeals to a wider range of people
 - ‘High Tech’ marketing feel
 - does not need a tool to open it
 - ‘modern’, ‘new’ perception as seen by the users
- (c) Award [**3 max**] each for evaluation of each of A, B, C, and reuse / recycling opportunities up to [**9 max**]

A <i>up to [3 max]</i>	plastic materials are generally more difficult to recycle [1]; especially if the plastic is mixed with another material [1]; could be washed and reused to pack sandwiches in [1];
B <i>up to [3 max]</i>	can be reused [1] or recycled [1]; reuse can be as a container for non-food items [1];
C <i>up to [3 max]</i>	can be recycled [1]; not easy to reuse [1];

[3] available for the clarity, logic of the arguments and the quality of the answer *i.e.* use of graphs, charts, table *etc.*
