This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners’ meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2012 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.
Section A

Part A – Product Design

1 (a) description of process
   – fully detailed 3–5
   – some detail, 0–2
quality of sketches up to 2
   7 x 2 [14]

(b) vacuum forming
   – range of colours
   – quick process
   – no finishing required
drilling and boring
   – Cylindrical material removal
   – accurate
   – single machine operation
edged and veneered
   – attractive
   – dimensionally stable
   – reduced weight/cost
   – environmentally friendlier 3 x 2 [6]

[Total: 20]

2 (a) suitable material including:
   – Aluminium/brass
   – MF, ABS
   – Appropriate hardwood 1

Reasons including:
   – Quality of finish – colour/attractive grain/texture
   – Easy to machine
   – Scratch resistant 2 x 1 [3]

(b) description to include:
   quality of description:
   – fully detailed 3–7
   – some detail, 0–2
quality of sketches up to 2 [9]
(c) explanation could include:
- change in process;
- change in materials;
- use of jigs, formers, moulds;
- simplification of design.

Quality of explanation:
- logical, structured: 4–6
- limited detail: 0–3

Quality of sketches: up to 2 [8]

[Total: 20]

3 (a) examples could be:
grip – width/length
finger / thumb operation
screen clarity
ease of opening lid

4 x 3 [12]

(b) Discussion could include:
- cost
- increased functionality
- materials
- size/weight

Examples / evidence could be
- Specific materials/components
- Specific functions

Examination of issues: 3
Quality of explanation: 3
Supporting examples / evidence: 2 [8]

[Total: 20]
Part B – Practical Design

4 (a) (i) SPST, DPDT, micro, tilt
name (1 mark) application (1 mark), explanation (up to 3)  [4]

(ii) thermistor, probe
name (1 mark) application (1 mark), explanation (up to 3)  [4]

(iii) LDR, photoresistor
name (1 mark) application (1 mark), explanation (up to 3)  [4]

(b) applications – video, audio, mechanical

quality of explanation
– logical, structured/detailed  4–6
– limited detail,  0–3

supporting examples
mp3 player, phone, tele-printer  up to 2  [8]

[Total: 20]

5 (a) mortice and tenon (square, sloping haunch other variation) dowel.
Name (1 mark) sketch (up to 2 marks)  3 x 2  [6]

(b) Cam lock, blocks
Name (1 mark) sketch (up to 2 marks)  3 x 2  [6]

(c) benefits could be:
– reduce assembly time
– reduce costs
– ease transportation/storage
– mix and match components

examples / evidence could be
– Specific product
– Modular (mix and match) opportunities

examination of issues  3
quality of explanation  3
supporting examples / evidence  2  [8]

[Total: 20]
6  (a)  (i)  leaf, skeleton, egg  
    (ii)  building, bridge, tower  

(b)  monocoque – shell structure, plane fuselage, car body
    frame – pylon, bridge
    examples (1 mark)  
    understanding of monocoque and frame  
    comparisons  

(c)  (i)  description of strut
    description of tie

    (ii)  triangulation
    ties, struts
    gusset plates
    quality of explanation
    – logical, structured  
    – limited detail  

[Total: 20]
Part C – Graphic Products

7 Correct planometric / scale detail – walls / positioning
   – table
   – seat
   – arch
   – barbecue

[Total: 20]

8 (a) Materials - high density foam, (can be fabric covered), rubber composites (open cell styrene, butadiene rubber or open cell SBR) with fabric bonded to the upper surface. Accept fabric, recycled rubber tyres, neoprene, silicone rubber, leather, glass, cork, wood, aluminum, stone and stainless steel. (1 mark)

Reasons – friction for mouse ball,
   – takes print
   – will not scratch table, desk surface (up to 2 marks) [3]

(b) Appropriate method, offset lithography, screen, gravure, flexography, transfer

Quality of description:
   – fully detailed
   – some detail,
   quality of sketches up to 2 [7]

(c) Discussion could include:
   – waste of resources
   – throw away culture/ litter
   – costs must be covered elsewhere

Examples / evidence could be
   – Specific promotion
   – Specific environmental/issue

Examination of issues
   quality of explanation
   supporting examples / evidence

[Total: 20]
9 (a) correct, working development 4
correct scale 2
tabs 2
accuracy/line quality 2 [10]

(b) quality of description:
– fully detailed 5–8
– some detail, 0–4
quality of sketches up to 2 [10]

[Total: 20]