UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2006 question paper

0445 DESIGN AND TECHNOLOGY

0445/03 Paper 3 (Realisation), maximum raw mark 60

This mark scheme is published as an aid to teachers and students, 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.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

The grade thresholds for various grades are published in the report on the examination for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses.

- CIE will not enter into discussions or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the October/November 2006 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

1 (a) base marked out correctly [1]
2 sides marked out correctly [2]
waste allowed between parts [2]

(b) (i) 2 reasons for manufactured board: will not shrink, twist or split [1]
not 'cheaper' [1]

(ii) suitable adhesive: epoxy resin, Araldite [1]

(c) (i) 2 constructions: stopped housing, dowel, mortice and tenon [1]
[1]

(ii) accuracy/quality of sketch [4]

(iii) accept any 4 stages in making the joint [2]
4 stages could include sawing, drilling, chiselling, [2]
[2]
[2]

(d)

pivots:	use of dowel or metal rod	[1]	
	details of sizes/depth of holes	[1]	
	details of pivot attachment	[1]	[3]
locking method:	simple interference fit	[1]	
	crude use of nuts	[2]	
	use of machined screws/bolts	[3]	[3]
materials and fittings named		[2]	[2]

[8]

2 (a) 2 properties: easy to bend, self-coloured, attractive finish, easy to work [1]
not 'lighter' [1]

(b) 2 reasons for modelling: test design, check size/proportion, avoid [1]
expense if mistakes are made, check overall appearance [1]

(c)

rectangular sheet	[1]
3 bend lines	[3]
2 tapered sides	[2]
correct proportion	[0-2]

[8]

(d) 2 marking out tools: chinagraph pencil, scriber, marker pen, template [1]
[1]

(e) (i) heating the plastic: for maximum marks description must include information about strip heater, line bender or oven, with plastic held securely until pliable [3]

(ii) bending the plastic: for maximum marks description must refer to 2 bends, the use of a jig or former and method of retention while cooling [5]

(f) 3 stages in finishing: scraper, draw file, wet or dry paper, polishing [1]
compound and polishing mop [1]
[1]

(g) to minimise risk: support sheet plastic with scrapwood underneath, ensure sheet is clamped securely, correct speed of drill, negative rake [2]

(h) (i) solvent: Tensol cement [1]

(ii) 2 precautions: well-ventilated room, wear a mask, avoid breathing in [1]
fumes, avoid contact with skin [1]
not 'goggles'

3 (a) suitable manufactured board: plywood, blockboard, chipboard, MDF
not 'hardboard'

(b) (i) finish: variety of paints, varnishes

reason relates to durable/hardwearing qualities, attractive appearance, ease of application, water resistant, smooth finish [1]

(ii) preparation: use of cork block and glasspaper, various grades, wipe down between grades, finish applied by brush, brushstrokes etc. or by spray [4]

(c)
top connected from underneath [1]
use of screws [1]
correct positioning [1]
accuracy of technical detail [1] [4]
nut and bolt through top 2 max.
screw only through top 2 max.
use of pegs 2 max.

(d)
3 different heights [1]
locking method [1]
ease of operation [1]
accuracy of technical detail [1] [4]

(e) 2 improvements: rounded edges, rounded corners, recesses [2]
for drinks, lipping applied to edges [2]

(f) 2 methods of joining steel tube: welding, brazing, soldering [1]
[1]

(g) (i) marking to length: use of rule, scriber, try square [3]
named 1 mark, sketch 1 mark

(ii) cutting to length: use of hacksaw with tube held securely in vice [3]
named 1 mark, sketch 1 mark

(iii) squaring ends: tube held in vice securely, use of hand/flat file, testing with try square [3]
named 1 mark, sketch 1 mark

4 (a) 2 visual characteristics: grain, figure, colour [1] [1]

(b) 3 design requirements: ease of access, easily identifiable DVDs, stable in use, attractive appearance [1] [1] [1]

(c) 3 tools to prepare to width: rule, straight edge, marking gauge, try square, jack/smoothing plane [1] [1] [1]

(d) **(i)** DVDs stored separately:
some form of 'spacer', i.e. strip of wood, dowel or metal pegs [2]

method of attachment [1]

accuracy of detail/communication [2] [5]
accept grooves/channels/housings cut into sides 4 marks max.

(ii) prevented from falling through:
some form of back or 'stops' in the form of wooden strips [2]

method of attachment [1]

accuracy of detail/communication [2] [5]

(e) **(i)** marking out mitres: use of mitre square, sliding bevel, knife
named 1 mark, sketch 1 mark [3]

(ii) cutting the mitres: use of a mitre box and tenon saw,
proprietary mitre box/saw, sanding disc with slide set to 45°
named 1 mark, sketch 1 mark [3]

(iii) clamping: use of mitre cramps at each corner, string cramps
with scrapwood [3]

(iv) checking for square: use of try square or measuring diagonals
named 1 mark, sketch 1 mark, shown inside plinth1 mark [3]