CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2014 series

0445 DESIGN AND TECHNOLOGY

0445/33 Paper 3 (Resistant Materials), maximum raw mark 50

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.

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Cambridge is publishing the mark schemes for the October/November 2014 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

CAMBRIDGE
International Examinations

Section A

1

vice	cast iron	1	
nuts and bolts	mild steel or brass	1	
saucepan	aluminium	1	**[3]**

2

to protect the surface of the bench	1	
to support the underside of the work piece to prevent splitting, clean hole	1	**[2]**

3

Tool	Name	Specific use
	Surform, rasp	Quick removal of wood
	Dividers	Mark out circles on metal and plastic

4 × 1 **[4]**

4

completed drawing should include extended straight edge	1	
slot and end drawn appropriately	1	
Award 0–2 dependent on technical accuracy		**[2]**

5

A	cross filing / diagonal filing	1	
B	draw filing	1	**[2]**

6 **(a)** flexible, absorbs impact, tough **[1]**

(b) to make it easier to hold short nails when hitting them **[1]**

7 **(a)** outer shell: polycarbonate, ABS, carbon fibre, GRP **[1]**

(b) inner shell: [expanded] polystyrene **[1]**

(c) buckle: polypropylene **[1]**

8 **(a)** warping, cupping **[1]**

(b) poor seasoning, uneven shrinkage **[1]**

9 **(a)** pocket screwing, counterboring, button, plate bracket
Award 0–2 dependent on technical accuracy
Accept use of more than 1 screw
Award 0 for screw through top **[2]**

(b) benefit is that the method allows for disassembly, stronger than nails, quick method of joining **[1]**

10 **(a)** tin snips, snips, straight snips **[1]**

(b) increased pressure can be exerted, more control when cutting, hands free easier to move sheet around, more stable, gives straight cut **[1]**

Section B

11 (a) 2 features include: large play surface, appropriate height, curved edges, edges prevent objects rolling off 2 × 1 **[2]**

(b) (i) 2 benefits include: quicker, can be used many times, more accurate than individual marking out, easier to mark out 2 × 1 **[2]**

(ii) electrically powered saws include: band saw, jig saw **[1]**

(c) (i) 2 benefits include: better surface finish, easy to work, more consistent structure, relatively cheap material, does not splinter, stable, available in sheet sizes 2 × 1 **[2]**

(ii) 2 advantages include: more even finish possible, no brush strokes, easier to cover a large area 2 × 1 **[2]**

(d) (i) to make the surface more hardwearing, easier to wipe, protect the MDF, improve appearance **[1]**

(ii) contact / impact adhesive, 'Thixofix' trade name or Evo Stik equivalent **[1]**

(e) Sketch 0–2
Additional notes 0–1
Accept any view of top and side: e.g. end view or 3D.
Accept sketch of **one** KD fitting for maximum marks.
Can be wooden block – does not have to be a pre-manufactured KD fitting. **[3]**

(f) use of applied wooden strips to all sides and ends 0–3
use of modesty block or similar 0–2
screw through edges 0–1
screw through top into support 0 **[3]**

(g) some form of hand hold shaped and positioned appropriately 0–2
award 1 mark for any additional detail 0–1 **[3]**

(h) legs shown 0–2
rails shown 0–2
accurate / appropriate sizes 0–1 **[5]**

12 (a) 1 advantage includes: cheaper than solid wood, easily cleaned, no surface finish required, durable surface 1

1 disadvantage includes: more difficult to work, limited traditional constructions, less attractive appearance than solid wood 1 **[2]**

(b) Suitable joints include: dowel, lapped joint, variety of KD fittings
Award 0–3 dependent upon accuracy of sketch 0–3
Mitre joint = 0–2
Butt = 0. Butt + pin or screw = 1. Butt + pin or screw + glue 2 marks.

Suitable joint named to match sketch 1 **[4]**

(c) (i) marking gauge, cutting gauge, try square, marking knife
accept any marking out tool appropriate to joint in **(b)** 2 × 1 **[2]**

(ii) Dependent on joint named in **(b)**
Do not penalise different marking out tools as long as appropriate to named joint
accept variety of tools including: tenon, vibro / Hegner saw or equivalent, chisels, drill bits 2 × 1 **[2]**

(d) Suitable permanent joints include: dowel, housing
Award 0–3 dependent upon accuracy of sketch 0–3
Suitable joint named to match sketch 1 **[4]**

(e) use of drilled holes with pegs, dowels, rods or pre-manufactured components
Award 0–3 dependent on technical accuracy **[3]**

(f) 4 mm plywood needs to be made thicker to support weight of work station
Award 0–2 marks for practical solution such as added rail 0–2
Award 0–1 marks for method of fixing to the work station 0–1 **[3]**

(g) (i) possible uses for pre-manufactured components include: stays on door fall, lock on door fall to lock against work station, use of KD fittings in the construction, shelf supports 3 × 1 **[3]**

(ii) 2 advantages include: quicker than making yourself, made-to-measure components, manufactured to good quality, convenient 2 × 1 **[2]**

13 (a) 2 benefits include: wide variety of colours available, self-finished, easy to bend to shape, attractive, can be joined easily 2×1 **[2]**

(b) (i)
acrylic held in a vice or clamped down on bench 1
use of appropriate saw to cut shape: coping, tenon, vibro / Hegner or equivalent 1
sawn edges filed flat 1
use of wet and dry to make smooth 1 **[4]**

(ii) Main stages include:
heat plastic using oven, strip heater, line bender 1
use of mould / former 1
retention of plastic while cooling 1
technical accuracy / quality of communication 0–2 **[5]**

(c)

Stage	Process
1	**Plastic granules fed into hopper**
2	**Granules heated up to liquid form**
3	**Forced by rotating screw into die**
4	The extruded tube cools.

3×1 **[3]**

(d) Methods include the use of 'brackets' that attach the tray to the tube
Practical solution 0–3
Details of constructions and fittings 0–2 **[5]**

(e) (i) Base must be stable and take the tube
Practical solution 0–2
Details of constructions and fittings 0–2 **[4]**

(ii) Sketch showing try square against the tube and base to check for upright
Award 0–2 dependent on technical accuracy **[2]**