9705 DESIGN AND TECHNOLOGY

9705/33 Paper 3, maximum raw mark 120

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Section A

Part A – Product Design

1 (a) Description of process
   • some detail (0–2)
   • fully detailed (3–5)
   Quality of sketches (up to 2) [7 × 2]

(b) Injection moulding
   • quality finish
   • quantity production
   • complex hollow shape formed in one piece
   • little wastage/recycle any waste

   Turning
   • cylindrical shape
   • high quality finish
   • boring and shaping function

   Pressing
   • even grain structure
   • speed
   • no wastage [3 × 2]

[Total: 20]
2 (a) Appropriate material including:
- solid wood – named appropriate hard or softwood
- mdf
- veneered/laminated chipboard

Reasons including:
- takes a good finish
- good aesthetic qualities,
- stable
- easy to process

(2 × 1) \[3\]

(b) Description to include:
- appropriate method;
- joining, permanent, KD
- carcase, back and shelf
- finishing including edges

Quality of description:
- some detail \(0–2\)
- fully detailed \(3–7\)

Quality of sketches \(\text{up to } 2\) \[9\]

(c) Explanation could include:
- change in process;
- change in materials;
- use of jigs, formers, moulds;
- simplification of design.

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

Quality of sketches \(\text{up to } 2\) \[8\]

[Total: 20]

3 (a) Materials
- quality of explanation \(\text{up to } 3\)
- specific material detail \(\text{up to } 5\)
- examples e.g. aluminium cricket bats
  carbon/graphite tennis racquets/fishing rods
  skis
  surfboards

(\text{up to } 2) \[10\]

Manufacturing technologies
- quality of explanation \(\text{up to } 3\)
- specific manufacturing detail \(\text{up to } 5\)
- examples e.g. alloying/reinforcement processes
  grp/composite layup
  lamination

(\text{up to } 2) \[10\]

[Total: 20]
Part B – Practical Technology

4 Mechanisms could be
- crank and slider,
- rack and pinion,
- cam and follower
- screwthreads

Quality of description including sketches

Examples e.g. car engine, drill, car jack, vice

[Total: 20]

5 (a) Output voltage
\[
\frac{9 \times 10}{12 + 10} = 4.1 \text{ V}
\]

(b) Quality of description
- limited detail
- fully detailed (using resistors/capacitors, 555 timer)

(c) Discussion could include:
Manufacturer
- wider range of products
- keeping up with technology
- reducing lead time
Consumer
- more choice –
- peer pressure – got to have products
- quality of life – efficiency/reliability of products

Examples/evidence could be
- mobile phones
- cameras,
- computers
- hand held games

Examination of issues
Quality of explanation
Supporting examples/evidence

[Total: 20]
6  (a)  (i)  Prepare steel for brazing/welding
Consider health and safety/protective clothing
Flux/clean
Position in hearth
Set flame/apply heat
Apply spelter/rod
Allow to cool, clean up

(ii)  Wire wool/prepare/clean pcb
Insert resistor
Flux or use flux core solder
Consider health and safety/fumes
Heat at joint with soldering iron
Apply solder – remove solder
Remove iron

Quality of description:
• some detail  
• fully detailed  
Quality of sketches (up to 2) (6 x 2) [12]

(b)  Quality of explanation
• some detail  
• fully detailed  
Appropriate examples e.g. various coatings, selective materials

[Total: 20]
Part C – Graphic Products

7  
(a) Correct front elevation [4]

(b) Main development construction
   Top [4]
   Joining [2]
   Accuracy/line quality [2] [10]

(c) Quality of explanation
   - some detail [0–2]
   - fully detailed [3–4]
   Comparisons [2] [6]

[Total: 20]

8  
Discussion could include:
   - feasibility/safety testing
   - architects – how buildings fit in with environment, walk through tests,
   - product designers – developing ideas, presenting to clients, testing function
   - engineers – safety testing, performance testing

Examples/evidence could be
   - town planning models,
   - vehicle testing
   - consumer/user trialling

Examination of issues
   - limited range [0–3]
   - wide range of relevant issues [4–8]

Quality of explanation
   - limited detail [0–3]
   - logical, structured [4–8]

Supporting examples/evidence [4]

[Total: 20]

9  
(a) Construction [3]
   Loci [2]
   Accuracy [3] [8]

(b) Quality of description
   - limited detail [0–2]
   - some detail, main functions covered [3–6]
   - fully detailed including constructions and materials [7–10] [12]

Quality of sketching [2]

[Total: 20]