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

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Section A

Part A – Product Design

1 (a) Appropriate material including:
- Aluminium/brass/pewter/silver
- Acrylic/polyester resin
- Any attractive hardwood e.g. ebony (1)

Reasons including:
- takes a good finish
- good aesthetic qualities,
- will not irritate skin (2 × 1) [3]

(b) Description to include:
- appropriate method;
- piercing/shaping/casting
Quality of description:
- some detail (0–2)
- fully detailed (3–7)
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:
- limited detail (0–3)
- logical, structured (4–6)
Quality of sketches (up to 2) [8]

[Total: 20]
2 (a) Description of process
   - some detail (0–2)
   - fully detailed (3–5)
   Quality of sketches (up to 2) [7 × 2]

(b) Blow moulding
   - accurate repetitive production
   - large numbers produced
   - even wall thickness
   - no need for extra finishing process

Shaping and joining
   - difficult to produce in one piece
   - prevents waste
   - strong construction
   - complex shapes formed

Milling
   - profile cutter for radius, slot cutter and face finishing
   - quick
   - accurate finish [3 × 2]

[Total: 20]

3 Discussion could include:
Cultural implications
   - avoid offence
   - target needs of tourist
   - product could have cultural value

Economic issues
   - pricing/promotion/placement strategies
   - value for money
   - support local economy

Examples/evidence could be
   - symbols/religion
   - cultural/historical value e.g. Dodo
   - size of product/packaging
   - recycled materials or protected species (e.g. timber/fur)

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) [20]

[Total: 20]
Part B – Practical Technology

4 (a) AC or AB compression  (1)
    BC in tension  (1) [2]

(b) \[30 \times 5 + 25 \times 2 = 200\] (1)
    \[200/5 = 40N\] (1) [2]

(c) Explanation monocoque (one piece)  (2)
    example e.g. airplane, egg  (1)
    explanation frame (several components) (2)
    example e.g. chair, building  (1) [6]

(d) Discussion could include:

- regular usage
- extreme conditions/shrinkage/expansion
- material change

Examination of issues

- limited range  (0–2)
- wide range of relevant issues  (3–5)

Quality of explanation

- limited detail  (0–1)
- logical, structured  (2–3)

Supporting examples/evidence  (2) [10]

[Total: 20]
5 (a) \[ \frac{B}{A} \times \frac{D}{C} \] 

\[ \frac{40}{20} \times \frac{30}{10} = 6 \] 
gear ratio 6:1

(b) (i) 

(ii) 

(c) explanation of mechanical example 

explanation of pneumatic example 

explanation of hydraulic example 

comparisons (up to 3) 

[Total: 20]
6 (a) Appropriate material including:
- zinc
- polystyrene

Reasons including:
- easily cast
- takes complex shapes
- can be finished
  
(b) Description to include:
- appropriate method;
- injection moulding
- die casting

Quality of description:
- some detail
- fully detailed

Quality of sketches

(c) Discussion could include:
- CNC CAD control – automated machines
- accurate/repetitive production
- quality control potential

Examination of issues
- limited range
- wide range of relevant issues

Quality of explanation
- limited detail
- logical, structured

Supporting examples/evidence

[Total: 20]
Part C – Graphic Products

7 (a) Discussion could include:
- genuine need/target market
- affordability/quality
- sale introductory offers
- market accessibility

Examples/evidence could be
- teenage/adult market
- tourist sites
- BOGOF

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) [20]

[Total: 20]

8 (a) Correct front sectional view (6)
Correct plan (4)
Scale (1)
Accuracy quality of line-work (5) [16]

(b) Appropriate ways e.g., knurling, shaping (2 × 2) [4]

[Total: 20]

9 (a) correct perspective (3)
approx twice full size (2)
quality of linework (3)
overall shape/proportion (6) [14]

(b) rendering roof (2)
walls (2)
other feature (2) [6]

[Total: 20]