CDT: DESIGN AND COMMUNICATION

Paper 7048/01
Structured

Key message

Whilst many excellent answers were seen, the following were considered to be areas where improvement could be made:

- The correct positioning of views in 3rd angle orthographic projection.
- The ability to draw a planometric view to scale from given orthographic views.
- The drawing of a given shape that involves circles and arcs that touch.
- The alignment of exploded views.
- The development of a standard packaging carton.
- The drawing of a regular polygon given the length of side.
- The drawing of loci of a moving part.
- The application of thick and thin lines to enhance a pictorial object.
- The different methods of research and the writing of a specification.
- The recognition of symbols and their meaning.
- The use of the correct convention in sectional drawings.
- A flow chart of the stages involved in a process.

General Comments

Candidates were required to complete **one** question from **Section 1** (**Question 1** or **Question 2**) and **two** questions from **Section 2** (**Question 3** – **Question 6**). This rubric instruction was followed by the majority of candidates but a number of candidates answered more than three questions.
Question 1 was the most popular of the Section **1** questions. **Question 6** and **4** the most popular of the Section **2** questions.

The standard of work was comparable to that of the previous year. It was clear from the responses that there are many able candidates who were well prepared for the examination.

Centres are reminded **not** to secure the papers together with string, staple, paper clip or a treasury tag. Candidate's answer sheets should be placed in the despatch envelope in the order listed on the attendance register. It is however, very important that the candidate completes his/her own details on **both** working sheets.

Comments on specific questions

Question 1

This question had been formatted to give the candidate the working order of drawing the views required.

(a) (i) Candidates were required to complete the front view by projecting the lengths down from the plan and taking the diameters of the cap and tube from the end view and the plan.

(ii) The end view required the candidate to project the diameter of the cap from the front view and draw this as a complete circle. The left hand part of the tube should have been drawn to give symmetry to the shape.

(b) Candidates were asked to write two specification points. Many candidates wrote a product analysis of what they know to exist.

(c) Most candidates completed the diagram to show the tooth brush having bristles and toothpaste coming out of the tube.

(d) Many candidates drew a circle Ø60. Some candidates drew a circle in isometric. A planometric view would show a second (part) circle 20 mm behind at 90°, 45° or 60°.

(e) Candidates were asked to complete the packaging for the toothpaste tube. Two similar sides needed to be added with a top, the same size as that given, positioned correctly. A glue tab was needed on the long side to join up the development. One glue flap needed adding to the bottom and two glue flaps (one each side of the top) needed to be added to the top. The correct convention for a fold line was given but this was not always repeated by candidates.

(f) Only a few candidates answered this question correctly. The question required a reason with an explanation of how the card packaging could be made environmentally friendly. Good answers included:

- Use recycled card so that fewer trees are cut down.
- Add a recycling symbol so that consumers re-cycle the card box after use.
- Use vegetable ink and biodegradable card does not pollute the soil.

Question 2

(a) Two orthographic views of a perfume bottle were given. Candidates were asked to draw a full size isometric view of the perfume bottle. Candidates who 'crated' the main body were successful in drawing the body with correctly sloping sides. Many candidates drew a 20 square top but this was not always centrally positioned and 25 high.

(b) The question required candidates to draw full size the outline shape of the label for the perfume bottle. This required the candidates to have a good knowledge of circles and arcs that touch. Most candidates drew the Ø40 correct and determined the point where the two arcs met. Many solutions were seen that had arcs that touched the circle and the meeting point but were not the correct size.

(c) A list was to be completed to show three pieces of information that would be printed on the label of the perfume bottle. Correct answers included:

- Manufacturers name
- Trademark
- Contact details
- Recycle symbol
- Fragrance / flavour
- Alcohol content
- Content
- Logo / slogan

(d) To produce 20, 000 colour labels, Digital Printing would be used.

(e) An exploded view of the point of sale display stand was required to be drawn with part **a** given. A pictorial view of the assembled stand was also drawn with the relevant parts clearly labelled.

The question required a part **b** drawn square and in proportion to part a with the rectangular hole aligned with the rectangular tongue of part **a**. Parts **c** and **d** were to be drawn below part **b**. Parts **c** and **d** were to have cross-halving joints centrally placed so that they slotted together. A recess in the top of both part **c** and part **d** was to be drawn in alignment with part **b** so that part **b** sat in the cross frame made by joining parts **c** and **d** together.

(f) Thick and thin line technique was to be added to part **a**. A thick line is only applied where one side producing the edge can be seen. Where two sides can be seen producing the edge then the line is left thin. Only a few candidates completed this question correctly.

(g) Many candidates failed to recognise that the question asked for three pieces of equipment that are used to cut 'foam board'. Correct answers included: craft knife, 'Stanley' knife, scalpel along with steel/metal rule, safety rule.

(h) This question asked for an 'explanation' of a check that would be made before assembling the display stand, for example, the size could be checked by measuring it with a rule.

Question 3

A small number of candidates attempted this optional question.

(a) A half hexagon was required to be drawn with a length of side 40. Various correct constructions were seen. The drawing of the sun lounger however, needed to be completed for full marks.

(b) (i) The path of P1 was a simple arc as the back rest folded flat.

(ii) The path of P2 required candidates to draw the arc of the 'knee' of the leg rest. This arc then needed to be divide into three/four points where the lower leg of the rest could be drawn and plots of P2 made. When joined, the plots of P2 made a smooth arc.

(c) This question required candidates to drawn an ellipse, major axis 60 and minor axis 40, in the correct orientation on the side view using the centre lines given. Using the information from the pictorial view, the plan view could then be lined in to show the ends of the ellipse, the left hand and the right hand creases (bends).

Question 4

(a) Candidates were required to render the sketch so that it represented clear plastic. Many candidates shaded in grey or blue but few used shading to show a reflective transparent surface.

(b) (i) Many candidates added lines at 45° and a back line parallel to the front of container A. Rectangular pots were well drawn but many candidates had difficulty drawing the circular pot and the internal recess of each pot.

(ii) Most candidates drew three circular pots in the correct orientation on the plan. A triangle was added by most candidates but this was not always an equilateral triangle. The side view drawn by many candidates was consistent with their plan.

(c) A line graph was required to show the increase in sales over a four year period. Many candidates used an appropriate scale and labelled correctly the X and Y axis. Four points representing values were plotted and a straight line completed the graph. Some candidates, incorrectly drew a Bar chart or Pie chart.

(d) Many candidates correctly identified the PVC plastic recycling symbol.

Question 5

(a) Many candidates added the names Segment, Sector, Diameter, Radius and Tangent correctly

(b) Many candidates also labelled the Hexagon and Parallelogram correctly but did not state that the Triangle was isosceles.

(c) This question was a known loci construction. Candidates were required to divide the left hand circle into 12. Also, to divide the distance between the start and finish into twelve equal parts to find the 12 centres of the circle as it rolls. The 12 circumference divisions of the left hand circle needed to be drawn parallel across the distance rolled and arcs (the radius of the circle) struck off to form plots on the horizontal lines. The plots can then be joined to form a smooth curve.

(d) Both the wheel and the back board needed to be hatched (45° or 60°) but each in different directions. The axle and the screw were to be left plain (un-hatched).

(e) Sketches and notes were required to show an addition/modification to the folded foam board to prevent it from slipping out of position. Many candidates achieved this by drawing a strip of foam board glued to the upright above the support. With fully supporting notes, this response scored full marks.

Question 6

A large number of candidates attempted this question.

(a) This question required candidates to draw a flow chart showing the stages in making a phone call on a mobile phone. The stages were listed and candidates were required to sort the order and draw a series of process boxes below and in line with the given start. Five boxes were required with a STOP box showing END. The boxes were to be linked by arrows.

(b) (i) Candidates were required to complete full size the drawing of a text symbol. Marks were awarded for the correct size, the two diagonals, the R10 curve and the gap between the diagonals and the curve.

(ii) Candidates were required to complete full size the drawing of the alarm symbol. Marks were awarded for a circle of R35, two arcs of R40, two lines at 45° and a horizontal line added to the base.

(c) Candidates were required to complete a two point perspective drawing of the mobile phone given in two orthographic views. Most candidate responses were drawn in perspective to the two vanishing points and in proportion size. A screen in proportion and perspective was added by many candidates. A key pad with 15 buttons proved difficult for some candidates with many not drawing the buttons in diminishing size towards the vanishing points. The chosen orientation (vertical or horizontal) by the candidate of the mobile phone was accepted.

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Paper 7048/02

Coursework

General comments

A good number of candidates used the assessment criteria headings to identify the different sections of their work and should be congratulated on the clear presentation of their folders. A number of candidates made use of ICT and some good computer-generated graphics work was seen. It is, however, important to maintain an appropriate balance between computer- and hand-generated work.

As reported in previous years, some candidates still tend to spend far too much time on the *Research and analysis* section, sometimes at the expense of other areas of their coursework folders. The mark allocation given in the assessment criteria provides a good guide to the amount of time that should be spent on each section of the coursework.

Comments on specific assessment headings

Problem identification

At the highest level, candidates demonstrated a good understanding of the design need and user requirements and a clear design brief was derived from the design situation. At the lowest level, candidates had done little more than to write a simple design brief.

Many candidates scored high marks in this section. Candidates had obviously been able to select a design problem that was of interest to them from those given in the question paper. It is at this stage that the intention of the project should be identified and set out clearly. The majority of candidates had successfully done this by sensibly basing their work in a local context and on a situation that they were familiar with. In the majority of cases, a clear design brief had been written. In some cases, design briefs were not specific enough.

Research and analysis

At the highest level, the research involved identifying the key areas of investigation that needed to be undertaken for the chosen task and then collecting and analysing data that would influence the design activity. At the lowest level, the research largely consisted of collecting irrelevant images or information.

This section provides candidates with the opportunity to consider all aspects of the design problem they have chosen to base their project on. Before collecting and analysing information, candidates should be encouraged to ask themselves the following questions: ‘What do I need to know?’; ‘Why do I need to know this?’; ‘Where will I find the information I need?’; and ‘How will I use what I have found out?’ Candidates need to understand that the research they undertake needs to be focused on, and relevant to, their chosen design problem.

A fair number of candidates looked, in an appropriate way, at existing situations or solutions so that they could draw on this experience when producing their own solutions to the design problem. However, as has been reported in previous years, many candidates gathered general information on materials, construction techniques and other aspects that had little or no relevance at this stage of the design process. This type of information was often taken directly from the internet or textbooks. Candidates need to understand that this approach simply wastes time and cannot be awarded marks.

The majority of the work undertaken in this section should be based around the research requirements outlined on the question paper. It is important that all research is analysed, it is not sufficient to just collect and describe a series of photographs.

Specification for a possible solution

At the highest level, the specification points were specific, based upon the research undertaken and completely defined the proposed product(s). At the lowest level, the specification points were general and could have been applied to almost anything.

The specification is worth 10% of the total marks available and, as such, should not be treated lightly. The more successful specifications were those where candidates had drawn on the results of their research and analysis to produce a list of specific requirements that their design solution must meet. Candidates need to understand that a detailed and meaningful design specification can form a useful aid for both producing their design ideas and for the evaluation of the final solution. In a large number of cases, specifications were far too general in their content. The better specifications justified why particular features needed to be included. For example, '*The product needs to be made from a waterproof material because …*'.

Proposals for a solution

At the highest level, candidates' design thinking was original and based on exploring ideas through ongoing evaluation and further research. At the lowest level, candidates focused on a single idea.

This is the opportunity for candidates to be really creative, and to record and consider a range of different ideas for a solution to their chosen design problem. Successful candidates did not restrict themselves to one or two basic ideas but produced a range of distinctly different design proposals that were well communicated using a variety of graphic techniques.

It is important that candidates annotate their design drawings and record their thoughts on each idea for possible future development. It is these notes that indicate to the reader how and why the candidate's ideas have been produced and developed.

A good number of candidates failed to carry out any real design development. In these cases, they simply selected an idea and made it.

Many candidates should be congratulated on the high quality of their drawing skills in this section of their design folders. The use of free flowing sketches rather than formal, instrument-drawn, illustrations should be used at this stage of the work.

Realisation

At the highest level, the making was complete and of an excellent standard resulting in products that functioned as intended. At the lowest level, the making was incomplete and of a low standard resulting in products that did not function as intended.

It is important that candidates include a number of high-quality drawings and photographs of their final outcome in their folder, as this is the only evidence of the final product that is seen by the Moderator. Currently not all candidates are doing this.

It is difficult to comment in detail about the products that were made but the majority of the work appeared to cover the intended range of appropriate materials, making skills and techniques.

There needs to be evidence that a candidate has planned the making of the product or model that they have designed. This should include details such as sizes, the materials that will be used, the construction techniques that will be used and the tools and equipment that will be used.

It is important that photographs showing the candidate making their product are annotated to explain what is going on in the photograph.

Evaluation

At the highest level, the product(s) had been fully tested against the specification and by gaining the opinions of potential users. As a result of this testing, detailed proposals for justified improvements were given. At the lowest level, a few subjective comments were made about the product(s).

Although some candidates continue to use ticked boxes against specification points, many others gave sound objective comments to indicate the success, or failure, of their solution. Candidates need to understand that as a result of objective testing, meaningful recommendations for improvement and modification can be made.

Some candidates did not attempt this section of the assessment criteria.