CDT: DESIGN AND COMMUNICATION

Paper 7048/01
Structured

Key messages

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

- the correct projection of views in 1st angle orthographic projection
- the drawing of a regular polygon given the length of side
- the development of nets
- the construction of foam board and how it can be bent to 90°
- the drawing of projection symbols for 1st and 3rd angle projection
- the drawing of two point estimated perspective
- the method of drawing an ellipse given the major and minor axis.

General comments

Candidates were required to complete **all** questions from ***Section A*** and any **two** questions from ***Section B*** (**B2**, **B3** or **B4**). This rubric instruction was followed by many candidates. However, some candidates answered all three questions from ***Section B***. Centres should remind candidates to follow the rubric instructions on the front of the question paper. Some centres issued extra sheets of A3 paper. This was not in the instructions for the examination as the candidates were required to respond on the question paper. Some candidates drew their responses on the inside cover of the question paper.

Question B4 was the most popular of the ***Section B*** questions.

It was clear from the responses that there are many strong students 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. Candidates' answer sheets should be returned to the cover and placed in the despatch envelope in the order listed on the attendance register. It is very important that candidates complete their own details on **all** working sheets and the A3 cover.

Comments on specific questions

Question A1

This question had been formatted to give the candidate the position of the views so that the required information could be added to the required view.

(a) (i) Candidates were required to complete the Front view in the direction of arrow **F**. This involved the projection of heights from the given End view. The widths for the Front view could be either taken from the given End view or projected via the Plan.

(ii) Candidates were asked to complete the Plan. Most candidates drew lines down from the End view and then projected across from a 45° projection line. Intersecting lines could then be joined to form a regular octagon of 20 side. A Ø30 hole could finally be drawn centrally on the Plan view of the octagon.

(b) Candidates needed to draw a full size, development (net) in the space provided. The development needed to have 8 equal sides with the heights taken from the End view given in **part (a)**. The

development required the correct convention for fold lines between each element and a glue tab drawn on one end. It was not important whether the development started with a tall side or a short side. The width of the glue tab needed to be adequate.

(c) (i) Candidates were asked to draw an insert for the octagon that would both keep its regular shape, and which would allow it to be glued inside the assembled development.

(ii) Candidates needed to draw glue tabs which were a suitable size and to a minimum of every other flat of the octagon.

(d) Double-sided tape was the preferred response to this question.

(e) The first angle projection symbol was to be completed by the addition of two concentric circles of the correct size, positioned to the right of the given cone, with a vertical centre line passing through the concentric circles.

Question B2

(a) Candidates were asked to complete a full-size isometric drawing of a container for condiments with corner **A** on the given point **A**. The base needed to be drawn 70 wide by 50 deep with an overall height of 120 starting on the given point **A**. The upstand needed to be drawn 60 wide in the centre of the base with a finger hole 40 × 20 positioned in-line with the chamfer. A middle divider in the base needed to align with the centre of the upstand. Candidates needed to draw the material 5 mm thick in all places.

(b) A list of the colours of cars sold over the past 12 months was given.

(i) The question required candidates to draw a pie chart from the results of a survey.

(ii) A suitable key to the drawn sectors was required. Many candidates used appropriate shading to show the sectors in a variety of colours.

(c) (i) Candidates were required to draw the cross section through foam board. Successful responses showed a layer of card/plastic paper top and bottom with a sandwich core of foam.

(ii) The process for making a 90° bend in foam board is by making a cut of 45° either side of the bend line but not penetrating the lower layer of paper/card. The foam is removed, and the 90° bend can be made.

(iii) A range of tools could be used to mark out and cut foam board. These included: pencil/marker, rule or straight edge, safety rule/steel rule for cutting, craft knife/scalpel.

Question B3

(a) A dimensioned drawing of the outline of a door sign for use in a hotel was given. Candidates were asked to draw a full-size drawing of the door sign to the given sizes on the centre lines provided.

Most candidates drew the R15 and the R35 correctly. To draw the end of the hook it was necessary to draw an arc of R25 on the centre given and a parallel line 10 up from the horizontal centre line. The R10 hook could be drawn to touch the horizontal centre line and continue the R15 and R35 curves. The square body of 70 side needed to have R15 quadrant corners. The centres of the quadrant curves could be plotted by drawing lines 15 mm parallel to the bottom edge and the two sides. Candidates needed to use compasses accurately to answer this question well.

(b) (i) The H shape given was to be enhanced by applying the thick and thin line technique. The rule for this application is that where only one side producing an edge is shown then that line is thick. All lines where both sides are visible producing the edge, then those lines are left thin.

(ii) The drawing needed to be rendered to look like a shiny (reflective) material. Any of the tonal reflective techniques was accepted.

(c) Two orthographic views of a circular seat from a children's soft play was given.

Candidates were required to draw a planometric view of the seat to a scale of 1:5 on the given centre line. In planometric, circular shapes appear as complete circles and in this case the base, seat and top edge are all aligned vertically. The seat needed to be 40 above the base and the top 20 above the seat.

Question B4

(a) Three orthographic views of a chocolate bar were given.

(i) Candidates were asked to draw a two-point estimated perspective view of the chocolate bar on the given start point and using the two vanishing points. (VP1 and VP2). Marks were awarded for the sides and heights to project back to the vanishing points and the proportions to be relative to those in the given views.

(ii) The third angle projection symbol needed to be completed by adding two concentric circles of the correct size, positioned to the left of the given cone, with a vertical centre line passing through the concentric circles.

(b) The number of guests staying in a hotel over a week was given.

(i) Candidates were asked to put the data into a 3D bar chart. Marks were awarded for 7 elements with the correct height/length of bar. The guest number needed to be labelled correctly.

(ii) Candidates needed to use shading or colour to enhance their bar chart.

(c) An elliptical key ring needed to be drawn to given major and minor axis. Marks were awarded for construction method, using the correct size and plotting up to 8 points. A final mark was awarded for drawing in a smooth curve to the candidate's solution.

CDT: DESIGN AND COMMUNICATION

Paper 7048/02
Coursework

Key messages

- Candidates should be encouraged to:
  - make full use of each page in their folder. Poorly planned page layout and over size headings should be avoided.
  - plan the use of their time effectively to ensure that they fully complete all aspects of the assessment criteria to the best of their ability
  - produce a clear and concise design brief, derived from the design situation, that demonstrates a good understanding of both the design need and the user requirements
  - collect relevant research data and then ensure that this is fully analysed and meaningful conclusions drawn
  - produce specification points that are justified through their research and completely define the product
  - to use a range of media to produce design proposals which consider all aspects of the product/s they are designing
  - give full details of the materials, construction methods and key dimensions required to make the product/s they have designed
  - include in their folder high quality photographs of the product/s they have made
  - provide details of all the stages involved in making through photographs and notes
  - consider the comments of potential users when evaluating the product/s they have designed and made.

General comments

Project folders were generally presented in a logical sequence, with good evidence of candidates having given the assessment criteria careful consideration. Stronger candidates used the mark scheme headings to identify the different sections of their work. The mark allocation given provides a good guide as to the amount of time that should be spent on each section of the design project.

A good range of freehand and computer-generated design work was seen in folders. ICT was often used for research but rarely used for Computer Aided Design (CAD) or Computer Aided Manufacture (CAM). Evidence of design development, in terms of testing and trialling materials and construction methods, was often the weakest section of a project. Products were generally complete and functioned as intended. In many cases the evaluation only included a comparison with the specification and not user testing or details of improvements.

Comments on specific areas

Problem Identification

This assessment objective requires candidates to interpret and clarify the design situation they have chosen and to write a Design Brief. All candidates appeared to be able to select a design problem from those given in the question paper that was of interest to them.

At the highest level a good understanding of the design need and user requirements was demonstrated, and a clear design brief derived from the design situation. Many candidates scored high marks by producing just one or two pages of A3 work.

Candidates who accessed the lower mark range produced only a simple design brief and scored one or two marks.

Research and analysis

This assessment objective requires candidates to collect and interpret information that is relevant to finding a solution to the design task.

At the highest level the research involved identifying the key areas of investigation that needed to be undertaken and then collecting and analysing data which would influence the design activity.

At the lowest level candidates gathered general information on materials, construction techniques and other aspects which 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.

Many candidates looked at existing designs to draw on this experience when producing their own design proposals. Candidates should be guided towards evaluating two or three appropriate products in depth rather than identifying many products and providing limited analysis.

All candidates need to plan their work carefully if they are to undertake appropriate primary and secondary research. A research plan, identifying what they need to find out and how they will gather this information is a good way of focusing the research. Once the relevant research data has been collected it must be fully analysed and conclusions drawn.

Specification

This assessment objective requires candidates to produce a list of points that define the key features of the design solution. Candidates are advised to make clear links between their research and their specification by analysing all their research findings and drawing conclusions that will subsequently form part of their specification.

At the highest level the specification points were specific and completely defined the proposed product/s. At the lowest level the specification points were general and could have been applied to almost any product.

Candidates needed to understand that a detailed and meaningful design specification would form a useful aid for both producing their design ideas and for the evaluation of the final solution. In a number of cases specifications were far too general.

Proposals for a solution

This assessment objective requires candidates to communicate and evaluate several proposals for a solution.

At the highest-level candidates' design thinking was original and based on exploring ideas through ongoing evaluation and further research. To score high marks in this section candidates must demonstrate that they have used their specification in the generation and evaluation of design solutions.

At the lowest level candidates focused on a single or very limited number of ideas.

This section provided the opportunity for candidates to be 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 which were well communicated using a variety of graphic techniques.

It was important that candidates annotated their design drawings and recorded their thoughts on each idea. It was these notes that indicated to the reader how and why the candidates' ideas had been produced and developed.

Many candidates showed a very high quality of drawing skills in this section of their design folders. There was much use of free-flowing sketches, rather than instrument drawn illustrations or ICT generated images.

Development and planning

This assessment objective requires candidates to make reasoned decisions about how the final design will be made and what materials will be used in its construction. This section was the weakest part of many folders because it was often little more than a redrawing of their chosen idea.

To gain high marks candidates needed to have devised and used a testing and trialling strategy in order to make reasoned decisions about their chosen design solution. Folders needed to contain a complete and accurate set of working drawings and a detailed plan showing the correct sequence for making the product.

Orthographic drawings were often used for the working drawings and Gantt or flow charts for the planning. It was possible to score high marks by using different drawing techniques if full details of the product were given.

Many folders needed more evidence of two and three-dimensional model making and testing to justify the high marks awarded. Working drawings and plans for making needed to be sufficiently detailed to enable a third party to produce the product. Information needed to be given about the materials, joining methods and sizes required to make the final product.

In many folders there needed to be more evidence that the candidates had planned the making of the product that they had designed.

Realisation

This assessment objective requires candidates to make the product.

Outcomes in this section were variable. 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.

Candidates needed to include several high-quality photographs of the final outcome in their folder. Some photographs were very low resolution, and this made it difficult to determine the quality of the product. In most projects, the work appeared to cover an appropriate range of materials and making skills.

Record of making process

This assessment objective requires candidates to use photographs and notes to record the making process. It was important that good quality annotated photographs showing the candidate making their product were included in the folder.

Many folders included photographs, but the quality was variable and, in some cases, highlighted health and safety concerns. e.g. use of drilling machine without a chuck guard or eye protection.

Very few folders included a record of making that gave details of all the required stages in the correct order. In general, only limited use was made of technical terms in any annotations that were included.

Evaluation

This assessment objective requires candidates to test the product and make suggestions for improvement.

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.

Many candidates used simple tick boxes against specification points as the key feature of their evaluation. A few expanded on the tick boxes by giving valid objective comments to indicate the success or failure of their solution. Candidates needed to understand that as a result of objective testing meaningful recommendations for improvements should be made.