CDT: DESIGN AND COMMUNICATION

Paper 7048/01
Structured

Key messages

Many excellent answers were seen. The following were considered to be specific areas where further improvement could be made:

- The correct positioning of views in 1st angle orthographic projection.
- The construction of corrugated plastic used extensively for signboards.
- The method of drawing an ellipse given the major and minor axis.
- The drawing of circles in isometric projection.
- The drawing of flow charts from given activities including feedback loops.
- The drawing of a regular polygon given the length of side.
- The ability to draw three dimensional charts from given data.

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 the majority of candidates. Some candidates answered all three questions from ***Section B***. It would be beneficial to candidates if they were reminded to follow the rubric instructions on the cover sheet. 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.

Question B3 was the most popular of the ***Section B*** 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 returned to the cover and 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 **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 drawing of an ellipse 1200 × 800. Many appropriate construction methods were seen. However, candidates who used a trammel needed to attach it to the exam paper or draw it adjacently to gain the marks for construction. The outer ends of the square tubes needed to be evident and also the hidden detail of the vertical tubes.

(ii) Candidates were asked to complete the end view. Candidates who looked at the projection symbol drew this view in 3rd angle projection with the board on the right-hand side of the vertical tubes. Hidden detail was required to show the wall thickness of the tubes.

(iii) The addition of the feet both sides of the vertical tube and the display board to the front of the tubes were both needed in the plan view

(b) The third 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.

(c) (i) Candidates were asked to provide a sketch to show the construction of corrugated plastic. Unlike cardboard, where the inner is a sine wave of material, corrugated plastic has vertical pieces of plastic that separate the upper and lower surfaces.

(ii) The term 'font' when referring to lettering is the shape or design of the style of the lettering.

(iii) The word 'COFFEE' needed to be added to the sign centrally in the space below 'FLYAWAY'. Marks were awarded for the same style font and in italic style.

(iv) Notes and sketches were required to show a method of attaching the plastic signs so that they could be regularly changed. The method should not require holes to be made in the signboard. Many candidates showed the use of support brackets or clips. The use of 'Velcro' if applied correctly was an allowable answer.

Question B2

(a) Candidates were asked to complete three geometrical shapes used for signs at an airport

(i) Two concentric circles were to be added of R30 and R35 to the STOP sign

(ii) An inverted equilateral triangle of 60 length of side drawn on the given centre lines gave the correct border for the 'Give Way' sign. A successful drawing showed the lettering centrally placed inside the triangular border.

(iii) An octagon with length of side 30 was required to complete the STOP sign.

The octagon could be drawn from a circumscribing circle or by drawing in the 45°diagonals of the square formed from the across flats dimension of the octagon. Arcs from the corners of the square to the centre could then be drawn to determine the corners of the octagon.

(b) The question required candidates to draw an isometric view of the baggage scales given the three fully dimensioned orthographic views. Most candidates correctly 'crated' the isometric view. However, to determine the true shape of the curved end, it was necessary to draw the diameter of the curve on both the orthographic view and the isometric view and each divided into $\frac{4}{5}$ equal parts so that datum lengths could be struck off on the isometric top surface to give a curve. By projecting lines down from the top surface, the depth could be struck off to give the same curve to the bottom edge.

(c) (i) Candidates were required to draw the development (net) of the sleeve of a hot drinks cup. This was achieved by drawing the development of a cone of which the sleeve was part. The development was achieved by extending the sides downward to determine the apex of the cone. The distance from the apex to the top and the bottom of the sleeve on one side was used to draw two compass arcs. A semi-circle was then required to be drawn on the upper line of the sleeve using the line as the diameter. The semi-circle was then divided into 6 using set squares and 1/6th was used to strike off 12 times on the upper arc (giving the circumference of the cone).

The shape of the development of the sleeve could now be drawn in. To complete the development a glue tab needed to be placed at one end.

(ii) The reasons why corrugated card is used for drink cup sleeves are that it remains rigid yet the construction allows for bending in one direction. The corrugated card has an air gap that prevents heat travelling from the cup to the user's hand.

Question B3

(a) (i) Candidates were asked to draw a three-dimensional bar chart on the given axes to display rainfall. The candidate needed to show an appropriate vertical scale (1:5 or similar) with accurate plots of the individual amounts. The columns were to be labelled and colour/shading applied to enhance the presentation.

(ii) Most candidates used an arrangement of the classic 'tear-drop' to depict rainfall.

(b) (i) Using the data given on hours of sunshine, candidates were required to draw a line graph. Again, a vertical scale needed to be created and the relevant hours of sunshine plotted accurately to that scale. The four plotted points were to be joined by a straight line.

(ii) Many suitable symbols for sunshine that included a circle and radiating lines were accepted as correct responses.

(c) The results of a survey showing the reasons for travel was to be represented as a pie chart. The relative numbers of travellers converted to degrees of a circle were as follows. Leisure 150°, Business 120°, Family 60° and Other reasons 30°. Using the determined angles, the pie chart could be drawn. To complete the question, correct labels or a 'Key' needed to be added and colour/shading applied to enhance the chart.

(d) (i) This question was not attempted by many candidates. Candidates need to know the relevant sizes of paper and how A4 has been derived from A2.

(ii) 'gsm' is a term used to show the thickness (or quality) of paper. It refers to the 'gram per square metre' of the paper. The higher the number, the thicker the paper.

Question B4

(a) A list of activities in the correct order, which first time flyers needed to go through to get from checking-in to departing on their flight was presented.

Candidates were asked to complete a flow chart showing the given stages.

The stages of 'Check-in', 'Go through security' and 'Wait in Departure area' were to be shown in activity (rectangular) boxes in a descending order below 'Arrive at airport'. A decision box (diamond) was required for the 'Is departure gate open'. The diamond required a 'YES' line flowing from its base and a 'NO' line attached to one side of the diamond returning in a loop to 'Wait in Departure area'. The loop must have a directional arrow on it.

Below the decision box must be one more activity box with 'Go to departure gate'. The last box must be a terminator shape with 'Board Aeroplane'.

(b) Two symbols were required to be drawn to show the time locally and the time in London. This could be drawn as an Analogue display or digital. The labels depicting the location and the time needed to be correct including am and pm.

(c) (i) A modification to the baggage trolley needed to show that they are not allowed. A simple diagonal line or cross, preferably in Red, were the main solutions seen.

(ii) The addition of a thick walled arrow pointing to the right gained full marks to this part of the question.

(iii) A symbol for 'Arrivals' was required to be drawn by the candidates. Most solutions showed the outline of a plane in descent as an ideogram.

(iv) Many drawings for the 'up' escalator were given. The responses that scored full marks showed an escalator with an 'up arrow' as a 2D side view.

CDT: DESIGN AND COMMUNICATION

Paper 7048/02
Coursework

Key messages

Candidates should be encouraged to plan their time effectively to ensure that they fully complete all aspects of the assessment criteria in the time allowed.
Candidates should be encouraged to make full use of each page in their folder. The use of large font, over size headings and elaborate borders should be avoided.
Candidates should be encouraged to produce a clear and concise design brief derived from the design situation they have chosen to explore. It is not sufficient to just present a copy of one of the design situations given in the question paper.
Candidates should be encouraged not to spend too much time collecting often irrelevant research. The research requirements outlined in the question paper need to be fully investigated.
Candidates should be encouraged to produce specification points which are specific to the product/s that they are designing.
Candidates should be encouraged to use a range of media to produce design proposals which consider all aspects of the product/s they are designing.
Candidates should be encouraged to give full details about the construction and joining methods, materials and dimensions required to make a model or prototype of the product/s they have designed.
Candidates should be encouraged to include high quality photographs of the product/s they have made in their folder.
Candidates should be encouraged to provide details of all of the stages involved in making the product/s they have designed.
Candidates should be encouraged to consider the comments of potential users when evaluating the product/s they have designed and made.

General comments

The more successful candidates showed evidence of having used the assessment scheme headings to identify the different sections of their work and provided clearly presented folders. Some candidates had made use of ICT and in a number of cases good computer generated graphics work was seen. It is, however, important to maintain an appropriate balance between computer and hand generated work. Some candidates spent too much time on the Research and Analysis section sometimes at the expense of other areas of their design project folders. The mark allocation given in the assessment scheme provides a good guide as to the amount of time that should be spent on each section of the design project.

Comments on specific assessment headings

Problem Identification

This assessment objective requires candidates to interpret and clarify the design situation they have chosen and to write a Design Brief.

At the highest level a good understanding of the design need and user requirements was demonstrated and a clear design brief had been derived from the design situation frequently using evidence in the form of photographs. Candidates who accessed the lower mark range produced only a simple design brief.

Many candidates scored high marks in this section. Candidates had obviously been able to select a design problem, from those given in the question paper, that that was of interest to them. It was at this stage that the intention of the project needed to 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 although in some cases design briefs were not specific enough.

Research and Analysis

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

Some candidates spent too much time on this section of their folder. Candidates need to plan their research if they are going to produce appropriate work. Candidates should include evidence of primary research as well as secondary research and would benefit from guidance as to whether work is relevant to this section or would be better suited to the Development and Planning section of their folder.

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 which would influence the design activity. At the lowest level the research largely consisted of collecting irrelevant images or information.

This section provided candidates with the opportunity to consider all aspects of the design problem they had chosen to base their project on. Before collecting and analysing information candidates should have been 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? How will I use what I have found out? Candidates needed to understand that the research they undertook needed to be focused on, and be 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. It is important that candidates should focus on how existing products meet the needs of the user. There was evidence of candidates labelling surface detail rather than investigating and analysing aspects such as size, materials, construction, production techniques, target market for product etc. Candidates should be encouraged to make more use of analytical and evaluative comments. Candidates should be guided towards evaluating two or three appropriate products in depth rather than identifying a large number of products and providing limited analysis. Many 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. Candidates needed to understand that this approach simply wasted time and would not be awarded marks.

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

Specification

This section of the assessment criteria required candidates to produce a list of points that defined the key features of the design solution.

Candidates are advised to make clear links between their research and their specification by analysing all of their findings as a result of the research they have undertaken and drawing conclusions that will subsequently form part of their specification.

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 any product.

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 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 good 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 ……..'.

A good specification is essential to scoring highly in all the remaining objectives.

Proposals for a Solution

This section of the assessment criteria required candidates to communicate and evaluate a number of 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 or very limited number of ideas.

This section provided 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 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 for possible future development. It was these notes that indicated to the reader how and why the candidate's ideas have been produced and developed. However, in some cases candidates used too much text to describe their design rather than using drawing to communicate it.

Some candidates did not consider all aspects of the product they were designing. For example when designing a piece of packaging the lettering and other surface detail was frequently not considered with a good number of candidates focusing their work on just the shape of the packaging.

To score high marks in this section candidates must demonstrate that they have used their specification in the generation and evaluation of design solutions.

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 have been used at this stage of the work.

Development and planning

This section of the assessment criteria requires the candidate to make reasoned decisions about how the final design will be made and what materials will be used in its construction. This information needs to be presented in a format that would allow a skilled person to make the product.

This section needed further development in many candidates' folders.

This section should be concerned about how a chosen design proposal could be turned into a prototype product.

In order 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.

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

Only a limited number of candidates produced a range of full or part models to test their design proposal. Details about sizes, joining methods and materials were, in general, limited. Work plans for making the product were very variable and frequently totally absent.

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

Realisation

This section of the assessment criteria required the candidate to make the product.

Outcomes in this section were very 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 need to include a number of high quality photographs of their final outcome in their folder as this is the only evidence of the final product that was seen by the Moderator. Not all candidates did this. It is difficult to comment in detail about the products that had been made but the majority of the work appeared to cover an appropriate range of appropriate materials and making skills.

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

Record of making process

This section of the assessment criteria required the candidate to use photographs and notes to record the making process.

It is important that good quality annotated photographs showing the candidate making their product are included in the folder.

While many folders included photographs the quality was very variable. Frequently the level of detail shown in the photograph or given in the annotation did not justify high marks being awarded in this section.

Very few folders included a record of making that gave details of all of 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 section of the assessment criteria required the candidate 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 had been given. At the lowest level a few subjective comments were made about the product/s.

While some candidates used simple 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 could be made.

Some candidates did not attempt this section of the Assessment Criteria.