

# CDT: DESIGN AND COMMUNICATION

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Paper 7048/01  
Structured

## Key Message

Whilst there were many excellent answers, the following were identified as areas where improvement could be made:

- The use of appropriate colour when rendering drawings to represent wood, metal and plastics.
- The use of correct conventions when identifying wood (end grain and side grain).
- The need to develop knowledge of industrial/commercial printing methods.
- The use of scaling to both increase and decrease the size of a drawing.
- The correct symbol to denote first and third angle projection.
- The use of given centre lines to correctly position drawings.
- The use of appropriate methods to correctly establish the centres of circles and radii.
- The use of a range of appropriate materials for joining graphic materials.
- The use of correct terminology rather than generic terms when describing processes.
- The use of correct line conventions e.g. centre and fold lines.
- The projection of required projections from a given view.
- The concept of true shapes projected from a given view.
- The use of simple mechanisms to be used for 'paper engineering'.
- The application of 'thick and thin' line technique to enhance pictorial drawings.
- The correct convention for cross hatching sectional drawings.

## General Comments

Candidates were required to complete one question from **Section A (Question 1 or Question 2)** and two questions from **Section B (Question 3 – Question 6)**. A significant number of candidates did not follow this rubric and answered more than three questions. **Question 2** was the most popular of the **Section A** questions and **questions 4 and 6** 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 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. 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

- (a) (i) Candidates were required to complete the word 'TABLE' in the correct position and in capitals. The only error was a minority of candidates who were unable to produce guidelines for the top and bottom of the word and hence drew it the wrong size.
- (ii) The left hand side of a pictorial view of a circular table top was given and the missing right hand side of the table top was correctly drawn as a half ellipse by the majority of candidates.

- (iii) Candidates were required to show how the two halves of the table slotted together (exploded drawing). However many who attempted this question showed the two halves assembled by copying the drawing shown as 'page 3' of the leaflet.
- (iv) The requirement was for candidates to render the drawing to look like pine (wood). However very many candidates failed to read the rubric instruction and followed the leaflet instruction to 'screw top into position' and showed screws being put into the brackets. Of those who followed the rubric, the majority chose an appropriate colour for the wood but were unable to show the convention for end grain and side grain.
- (b) The requirement was for candidates to describe the function of the leaflet but those who described it as to explain the assembly of the table, gained no credit as 'assembly' was used in the question.
- (c) This question was intended to test candidates' knowledge of the weight of paper and printing methods. Very few candidates identified an acceptable weight and/or correct printing methods. As the quantity required was relatively small (200) 'photocopying and laser-printing' were acceptable but generic terms e.g. 'printer' were not.
- (d) Candidates were required to complete an assembled front elevation and plan of the table to a scale of 1:5. There were some excellent solutions but many candidates were unable to understand the significance of the scale or the given centre lines. There were a significant number of candidates who tried to replicate the pictorial illustration on the leaflet. Most candidates included the brackets in their solution.
- (e) Many of the candidates who answered this question also attempted a symbol. The correct symbol for 1st Angle Projection is a pair of concentric circles centred on the given centre lines and a truncated cylinder drawn to the left with the larger end of the cone nearest the two circles.
- (f) Many candidates seemed to miss this question or were confused by the scale, hence there were few correct answers seen.

### Question 2

- (a) The candidates were given a reduced drawing of a wall mounted kitchen jotter. Their task was to draw an accurate full size view from a given starting point 'A'. Many candidates gained full marks. The largest reason for losing marks was inaccurately sized or positioned 20 mm radii. Also a significant number of candidates did not use the starting point, although they produced an accurate final drawing.
- (b) There were very few instances where candidates provided two correct answers but there were many inappropriate answers e.g. 'nuts & bolts', 'screws' 'nails' etc.
- (c) Markers and felt pens scored highly but many candidates suggested inappropriate methods.
- (d) Candidates' responses to this rendering question were mixed. Some candidates chose to ignore this part of the question. There were many examples of some rendering being added with an attempt at gradation but there were a few that also added a highlight to show a reflective surface.
- (e) The question required candidates to modify the elephant's trunk to hold a pen. There were some attempts at rolling, bending or drilling the end of the trunk but often solutions ignored the fact that the jotter was attached to a wall or that the acrylic is thinner than the thickness of a pencil. Many candidates did not appear to read the question or joined the end points which gained no marks.
- (f) The requirement to produce a development (net) for a box to hold the jotter was clearly understood by the majority of candidates who produced well-proportioned, accurate solutions. However, marks were lost due to failure to use the correct line convention for 'fold' lines. Many candidates missed the requirement for the eye of the elephant to be visible when the box was closed.

### Question 3

- (a) (i) A significant number of candidates who attempted this question were unable to identify a cylinder.

- (ii) Most candidates produced 3D sketches, although, the 'triangular prism' was often represented as a simple triangle and the 'hexagonal prism' as a variation of an octagon. The truncated cone was well attempted by some candidates, although, many lost marks by not including a hole for the candle which was clearly shown in the examples.
- (b)(i) Many inaccurate plans were drawn by not projecting from the given front view. Additionally, the lines linking the corners were often missing from answers.
- (ii) Candidates were required to draw the true shape of face 'X' but there were very few attempts or correct solutions.
- (c) This question required candidates to draw an estimated perspective drawing on given base lines to two given horizontal vanishing points. There were many good solutions but some candidates lost marks due to not drawing the four top lines to the VP's. Others left off or made an unsatisfactory attempt at drawing the recess for the candle.

#### Question 4

- (a) This question required candidates to design a mechanism that would cause elements to move as indicated by the use of linkages, fixed and moving pivots. There were very few workable solutions.
  - (i) A number of candidates linked X and Y but did not indicate the position of the pivots.
  - (ii) This could be answered with a linkage, slider or a rotating disc which some candidates identified.
  - (iii) A number of candidates linked the input and output elements but did not indicate the positioning of the pivots which led to solutions that did not work.
- (b)(i) The solution to this question was a bar chart which was generally well answered. Most successful solutions realised that 10 mm per 1000 was appropriate for the vertical scale. Where marks were lost, it was due to inaccurate scales, not labelling both axes or failure to enhance the appearance of the chart by the use of colour.
- (ii) The majority of candidates gained credit for being able to name at least one other method of graphically displaying data and a significant number correctly named a second method.
- (c)(i) This question combined isometric projection, scaling and 'paper engineering'. The isometric element was generally accurately drawn but interpretation of the 'pop-up' element caused some confusion – often being placed in the wrong position.
- (ii) 'Thick and thin line technique' was missing from the majority of solutions.

#### Question 5

- (a) This question required the production of a planometric solution to a given orthographic drawing to a *scale* of 1:2. The drawing combined three elements: a tray, a 46 mm sq. tube 76 mm long and a 46 mm sq. tube 56mm long. The planometric drawing was to be constructed on a given start point 'A'.

The drawing of the tray in planometric projection was generally well undertaken to its overall dimensions scaled down. However, the top thickness of 2 mm and the internal line were often inaccurately drawn or missing.

Many candidates did not arrange the two tubes correctly inside the tray with reference to point 'A' and did not allow for the thickness of the bottom of the base. The two tubes were often drawn inaccurately with missing detail – notably the thickness of the top and the visible internal line.
- (b) The requirement of this question was to show graphically how the tubes are arranged in the tray ready for packaging. There were a number of good solutions but some candidates were confused by the polystyrene packaging in the given final stage which gave the impression that the tubes were rectangular (not square) and copied this in their solutions.
- (c) Many candidates seemed to miss this element completely. Those that attempted an answer gave a correct width but not height (forgetting that the tubes are laid down when packed for packaging).

- (d) The requirement for adding cross hatching was missed by many candidates. Many candidates who attempted the question correctly identified the cut faces but showed the hatching as crosses e.g. xxxxxx rather than the convention of 'cross hatching' e.g. // or \\\.

#### Question 6

- (a) This question required candidates to sketch the shapes required to make the body that was illustrated. There were many good answers – the arms and chest were correctly interpreted, the arms being correct shape, symmetrical and of the correct length. The chest was correctly drawn. The legs caused the most difficulty, generally drawn the correct shape but rarely symmetrical about the centre line.
- (b) The requirement for this question was to produce an orthographic projection from a given isometric drawing of a pentagon shaped weight. Most candidates gained some marks for drawing a pentagon in the correct orientation and including all relevant lines on the plan view. There were cases where candidates did not project the plan from their front elevation.
- (c) Candidates' responses to this rendering question were mixed. The question was not answered by some candidates. There were many examples of some rendering being added with an attempt at gradation but a few also added a highlight to show a reflective surface. The shading to the top was not always correctly applied.
- (d) This question required the construction of an ellipse on given centre lines. It was consistently well attempted, with the concentric circles method being the most popular method.

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Paper 7048/02  
Coursework

## General comments

A significant number of the candidates had 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 had 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 has been reported in previous years some candidates still tend to spend 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 as to the amount of time that should be spent on each section of the coursework.

## Comments on specific assessment headings

### **Problem identification**

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 was of interest to them. 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.

### **Research and analysis**

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? 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, 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 text books. Candidates need to understand that this approach simply wastes time and cannot be awarded any credit.

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 simply collect and describe a series of photographs.

## **Specification for a Solution**

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 significant 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**

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 which 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 significant number of candidates did not 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.

## **Realisation**

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 had been made but the work appeared to cover the intended range of appropriate materials and 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**

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.