EXAMINATIONS COUNCIL OF ESWATINI

Eswatini General Certificate of Secondary Education

Design and Technology (6902)

Examination Report for 2024

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EGCSE DESIGN AND TECHNOLOGY

Paper 6902/01

Design Core

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Question 1 Introduction

The Design and Technology syllabus consists of four components, namely: Paper 1 (Design Core), Paper 2 (Graphic Products) which is an option, Paper 3 (Resistant Materials) which is an option paper and Paper 4 (Coursework).

Number of centres and candidates from 2019 to 2024: The table below represents statistics of number of centres and candidates that have sat for the Design and Technology external examination for the past five years.

Year	2019	2020	2021	2022	2023	2024
Centres	100	103	103	97	103	112
Candidates	814	858	1340	740	1005	1065

Comment on number of centres: The statistical data presented in the table above indicates that the number of centres offering Design and Technology increased by twelve (12) between 2019 and 2024. There has been a significant increase in the number of centres offering the Design strand of the school curriculum from the year 2022 to 2024, although there was a sharp decline by six centres between 2021 and 2022. This statistic reflects that there are centres who do not register any candidate for the subject although they offer it, this is evident by the fluctuating manner the statistic shows even though there are two new girls' schools that introduced Design and Technology.

Comments on number of candidates: Even though the figures in the table above indicates that the number of candidates sitting for Design and Technology was increasing by the past years, in 2022 we have seen a sharp fall that was never experienced in the past 10 years and the 740 was far below the expectations. Statistically the number of candidates that had registered for the subject in 2023 was 1 005 which shows an increase of 265 candidates who registered for the subject and that is highly commendable. However, the number of candidates who registered for 2024 exam increased to **1 092** and those who finally sat for the exam increased to **1 065**. Attendance registers revealed that some candidates who registered were absent during the examination period.

In 2024 there were 05 centres which registered only 1 candidate, which was an improvement compared to the previous year as there were 6 centres. 57 centres had registered between 2 and 10 candidates collectively, compared to the 58 centres in 2023; whilst a total of 48 centres registered a range of 11 to 20 candidates, an increase of 22 from the previous year. There were 4 centres who registered a range of 21 to 30 compared to 2022 which had only 9. The highest number of candidates were 24, 27, 30 and 44 registered in five centres.

As noted in previous reports, there are areas in the syllabus that need improvements. Such areas are: dimensioning, rendering techniques, line quality, proportions, detailed construction, graphic communication, graphical materials, working in card, card joints, lettering style, evaluation of ideas, types and usage of mechanisms including mechanical movements.

Key messages

- Full solutions to the design problem in response to part **(e)**, should include constructional details rather than manufacturing methods that might be used in the workshop or design studio.
- Candidates should remember that simple drawings are often better than words when describing manufacturing methods that are suggesting response to part **(g)**.
- Graphic Products candidates should manipulate card/graphic materials so that they understand their option very well and be able to answer to the point when doing question 2.
- Graphic Products candidates should be assisted by being given a chance to make prototypes in their Graphic laboratories so that they can answer question **(g)** with ease.

General Comments:

Candidates responded as intended to all three optional questions and there was an increase in the number of candidates opting for **Questions 3,** there was a slight decline in those opting for **Question 2 and 3** compared to the previous year. **Question 1** was, by far, the most popular choice question for candidates. One thousand and sixty-five (1 065) candidates sat this paper. Of these candidates nine hundred thirty-two (932) opted for **Question 1,** whilst one hundred and ten (110) chose **Question 2** whilst twenty-four (24) answered **question 3**.

Quite a number of candidates responded very well to the design question of their choice and very few could not engage competently in the design problems set in the context of pre-school toy storage, COVID-19 awareness class display for Design and Technology class and the can crushing device. Candidates were to show a high level of originality in their design work.

The A3 answer sheets are intended to help candidates follow the required design process and those candidates who responded as required were able to effectively demonstrate their design and thinking skills.

Comments on Specific Questions

Question 1

Design a pre-school storage unit that would keep and display at least three different types of toys. This was the most popular question compared to the other two as there were 932 candidates out of 1066 candidates who answered this question. The majority of candidates who attempted this question understood the requirements of the Pre-school toy storage unit.

(a) Candidates were required to list **four** additional about the function of such a unit that you consider to be important.

Comments; Majority of candidates were able to list correctly the **four** additional about the functions of such a table that they consider to be important. Some manage to get three correctly, ery few candidates who got two marks and none got less than two in this question. Candidates reflected a great improvement in this examination and it highly commended.

Expected responses four suitable points include;

- lockable,
- easy to clean
- waterproof/moist resistant
- easy access of toys
- has appropriate height
- keep dust out, non-toxic
- attractiveness/eye catching stable in use
- easy to see items
- safe to use
- easy to move around
- durable
- has labels for the different toys
- take different sizes of toys etc.
- no repeats of question and design brie

Common mistakes

- Very few candidates repeated the given function points instead of adding four additional points as the question required.
- There were responses that had nothing to do with the functions of the toy storage unit such as naming the materials to be used to make the unit,
- whilst some were not justifying their responses which led them to lose marks

(b) Candidates were asked to use sketches and notes to show **two** types of corner joints that could be used on a carcase (box) construction.

Comments: Most candidates were able to sketch two different types of corner joints although some made some mistakes which cost them some marks.

Expected responses: two of the following corner joints;

- dovetail joint
- finger joint
- dowel joint
- Strengthened butt joint etc.

Common mistakes:

- Some candidates were able sketch a box construction joint but gave an incorrect name or give a wrong joint name to an appropriate joint.
- Some were giving frame construction joints such as frame mitre joint, table construction joints such as mortise and tenon joints.
- Others were sketching butt joints that are not strengthened and they lost some marks.

(c) Candidates were expected to develop and sketch **three** ideas for the unit.

Comments: Most candidates were able to develop and sketch the **three** ideas, showing creativity in their response to the design problem and scored very good marks. Very few came out with less than the required three concepts which were marked on pro-rata basis. However,

Expected response:

- Sketch three different ideas for maximum marks showing high quality sketches.
- Using wide range of enhancement techniques with colour or other forms of highlighting.
- Clearly represent the materials and material texture.
- With clear annotation and details to provide information on the nature and detail of each design idea.
- Ideas should meet the given design brief and the specifications listed in (a).
- Use the joints given in question (b).

Common mistakes;

- Some candidates sketched only one or two ideas.
- Others failed to represent their ideas properly as they were poorly sketched and they lost valuable marks.
- While others failed to enhance their ideas but they only covered them with colored pencil.
- Quite a number of candidates did not include dimensions/sizes when adding their annotations while others sketched ideas that did not meet the given design brief.
- Others did not show or tell how the ideas parts joined.
- Some did not show how the 3 ideas are stored.

(b) Candidates were required to evaluate their ideas and justify why they have chosen one idea to develop it more fully.

Comments: Majority of candidates were able to select their preferred idea and gave a clear justification for their choices.

Expected response:

- Evaluate all three ideas by giving **one** advantage and one disadvantage for each and every idea.
- Select the chosen idea and justify why it has been chosen.
- Candidates included comments which showed valid judgments rather than just simple descriptions of each design idea.

Common mistakes:

- Some candidates were writing more than one advantages or disadvantages which made them to run short of them when getting to the next idea.
- Repeating some of the advantages stated on the evaluations led some to loose valuable mark
- Some candidates used the justification which say they chose a particular idea because it meets all specifications and they lost some marks.

(e) Candidates were to draw a full solution of the chosen idea, include construction details and major dimensions.

Comments; Candidates were at liberty to use any drawing method to produce a full solution to the given problem as long as they provided the required constructional details and dimensions.

Expected response:

- Candidates were expected to draw a high standard of drawing preferable a 3d drawing showing a range of techniques that shows clearly all the details of joining the different parts.
- Show at least three overall dimensions and add more additional dimensions that may show thicknesses, diameters and depths. Also show all constructional details with good annotation and additional drawings as necessary.

Common mistakes

- Very few candidates were able to produce high standard of drawings
- Did not use wide range of enhancing techniques some
- Some did not add the constructional details in the form of sketches or in written annotations.

- Some only showed the three overall dimensions only with no detail dimensions, in that way they lost valuable marks.

(f) Candidates were to suggest two suitable materials for their solutions and give reasons for their choices.

Comments: Many candidates appropriately selected specific materials for their design presented in the previous section, although some were just naming irrelevant materials to their designs. Very few candidates gave generic responses such as wood/metal/plastic, such responses were not awarded marks.

Expected response:

- Give a suitable materials and reasons for the choice.
- Give sound reasons for the choices, that indicates candidate consideration of the structure of his/her design and are familiar with the strengths and weaknesses of the specific materials in context.

Common mistakes;

- Some candidates gave irrelevant materials such as card which cannot perform the storage task.
- Others gave reasons that did not match the material stated and they lost some marks.

(g) Candidates were to outline a method that could be used to manufacture one part of their solution in a school workshop.

Comments; this question was poorly performed by majority of candidates.

Expected response;

- A detailed/step by step description of manufacturing one part including appropriate method and tools used.
- Responses to this part needed to include details beyond general marking out and preparation methods done to any product part.
- Other details such as shaping, marking and cutting of joints to the selected part till it is ready to be assembled to the other parts is very much needed, also showing the tools used.
- The use of simple drawings in addition to written text was generally successful.

Common mistakes;

- Majority of candidates did not state the method of manufacture and they lost valuable marks.
- Some stated a joint instead of a method of manufacture.
- Most candidates gave scanty description of the processes through annotated sketches.

Question 2

Design a folding display to promote COVID-19 awareness in a Design and Technology class.

This question was attempted by 110 out of 1066 candidates. It was intended for those who are doing the Graphic Products option. Candidates appeared to be familiar with the requirements of the COVID-19 awareness promotional display

(a) Candidates were required to list **four** additional about the function of such a unit that you consider to be important.

Comments; Majority of candidates were able to list correctly **four** additional points about the functions of such a class display that they consider to be important and they got all the marks in this question. Some manage to get three marks, very few candidates who got two marks and none got less than two in this question.

Expected responses four suitable points include;

- Attract attention/eye catching
- Inform about COVID -19
- light in weight/easy to carry
- colorful
- invite people to read
- visible
- stable in use
- durable
- easy to set-up
- safe to use
- no repeats of question and design brief

Common mistakes

- Very few candidates repeated the given function points instead of adding four additional points as the question required.
- There were responses that had nothing to do with the functions of the class display which promote COVID-19 such as naming the materials to be used to make the display.
- whilst some were not justifying their responses which led them to lose marks

(b) Candidates were asked to use sketches and notes to show **two** types of corner joints that could be used on a carcase (box) construction.

Comments: Most candidates were able to sketch two different types of temporal joining methods for lightweight materials, although some made some mistakes for not reading the question wit understanding which cost them some marks.

Expected responses: two of the following methods by which card or other lightweight materials can be joined temporarily;

- Slotted joints
- velcro
- adhesive tape
- split rings
- metal clips
- binders
- bostic
- string

Common mistakes:

- Some candidates were able sketch butt or dovetail joint.
- Some were giving welded joints.
- Others were giving stapled or glued joints which gives a permanent joint.

(c) Candidates were expected to develop and sketch **three** ideas for the unit.

Comments: Most candidates were able to develop and sketch the **three** ideas, showing creativity in their response to the design problem and scored very good marks. Very few came out with less than the required three concepts which were marked on pro-rata basis. However,

Expected response:

- Sketch three different ideas for maximum marks showing high quality sketches.
- Using wide range of enhancement techniques with colour or other forms of highlighting.
- Clearly represent the materials and material texture.
- With clear annotation and details to provide information on the nature and detail of each design idea.
- Ideas should meet the given design brief and the specifications listed in (a).
- Use the joints given in question (b).

Common mistakes;

- Some candidates sketched only one or two ideas.
- Others failed to represent their ideas properly as they were poorly sketched and they lost valuable marks.

- While others failed to enhance their ideas but they only covered them with colored pencil.
- Quite a number of candidates did not include dimensions/sizes when adding their annotations while others sketched ideas that did not meet the given design brief.
- Others did not show or tell how the ideas parts joined.
- Some did not show how the 3 ideas are stored.

(d) Candidates were required to evaluate their ideas and justify why they have chosen one idea to develop it more fully.

Comments: Majority of candidates were able to select their preferred idea and gave a clear justification for their choices.

Expected response:

- Evaluate all three ideas by giving **one** advantage and one disadvantage for each and every idea.
- Select the chosen idea and justify why it has been chosen.
- Candidates included comments which showed valid judgments rather than just simple descriptions of each design idea.

Common mistakes:

- Some candidates were writing more than one advantages or disadvantages which made them to run short of them when getting to the next idea.
- Repeating some of the advantages stated on the evaluations led some to loose valuable mark.
- Some candidates used the justification which say they chose a particular idea because it meets all specifications and they lost some marks.

(e) Candidates were to draw a full solution of the chosen idea, include construction details and major dimensions.

Comments; Candidates were at liberty to use any drawing method to produce a full solution to the given problem as long as they provided the required constructional details and dimensions.

Expected response:

- Candidates were expected to draw a high standard of drawing preferable a 3d drawing showing a range of techniques that shows clearly all the details of joining the different parts.

- Show at least three overall dimensions and add more additional dimensions that may. show thicknesses, diameters and depths. Also show all constructional details with good annotation and additional drawings as necessary.

Common mistakes

- Very few candidates were able to produce high standard of drawings
- Did not use wide range of enhancing techniques some
- Some did not add the constructional details in the form of sketches or in written annotations.

- Some only showed the three overall dimensions only with no detail dimensions, in that way they lost valuable marks.

(f) Candidates were to suggest two suitable materials for their solutions and give reasons for their choices.

Comments: Many candidates appropriately selected specific materials for their design presented in the previous section, although some were just naming irrelevant materials to their designs. Very few candidates gave generic responses such as wood/metal/plastic, such responses were not awarded marks.

Expected response:

- Give a suitable materials and reasons for the choice.
- Give sound reasons for the choices, that indicates candidate consideration of the structure of his/her design and are familiar with the strengths and weaknesses of the specific materials in context.

Common mistakes;

- Some candidates gave irrelevant materials such as card which cannot perform the storage task.
- Others gave reasons that did not match the material stated and they lost some marks.

(g) Candidates were to outline a method that could be used to produce a prototype of the class display in the school Graphics studio.

Comments; this question was poorly performed by majority of candidates. Most candidates show that they cannot make the prototype of their product in a school graphics studio.

Expected response;

- A detailed/step by step description of producing the prototype including appropriate method and tools used.

- Responses to this part needed to include details beyond general marking out and preparation methods done to any product but give a clear details of steps taken from selection of background, draft an outline, decide colour scheme, add some images, and add the massage with appropriate font sizes.
- Other details such as printing, shaping, joining making the folding mechanism also showing or stating the tools used.
- The use of simple drawings in addition to written text was generally successful.

Common mistakes;

- Majority of candidates did not state the method of manufacture and they lost valuable marks.
- Some stated a joint instead of a method of manufacture.
- Most candidates gave scanty description of the processes through annotated sketches.

Common mistakes;

- However, there were those that gave scanty description of the processes through annotated sketches.
- Most candidates were only producing one part instead of the whole prototype. Lastly most candidates lost marks for not stating the name of the method of manufacture used.

Question 3

Design a device that could be used to crush empty can so that they take up less space for storage.

Only 23 out of 1066 candidates answered this question. In this question candidates were required to use their knowledge and experience of systems and control and the use of mechanisms and electronics in the context.

(a) Candidates were required to list **four** additional about the function of such a unit that you consider to be important.

Comments; Majority of candidates were able to list correctly the **four** additional about the functions of such a table that they consider to be important. Some manage to get three correctly, very few candidates who got two marks and none got less than two in this question. Candidates reflected a great improvement in this examination and it highly commended.

Expected responses four suitable points include;

- Easy to load
- easy to clean
- easy to empty
- safe lock
- convenient height
- stable in use
- Corrosion/water resistant
- Have mechanical advantage
- easy to see items
- safe to use
- secure container
- durable
- easy to maintain
- auto return
- no repeats of question and design brief

Common mistakes

- Very few candidates repeated the given function points instead of adding four additional points as the question required.
- There were responses that had nothing to do with the functions of the device such as the aesthetics of the device,
- whilst some were not justifying their responses which led them to lose marks

(b) Candidates were asked to use sketches and notes to show **two** types mechanisms that could be used in such a device.

Comments: Most candidates were able to sketch two different types of mechanisms although some made some mistakes and they lost some valuable marks.

Expected responses: two of the following corner joints;

- levers
- screws
- camand follower
- gears
- hydraulics
- linkages
- hinges

Common mistakes:

- Some candidates were drawing joints instead of the mechanisms.
- Others were sketching the mechanism but named it incorrectly and they lost some marks.

(c) Candidates were expected to develop and sketch **three** ideas for the unit.

Comments: Most candidates were able to develop and sketch the **three** ideas, showing creativity in their response to the design problem and scored very good marks. Very few came out with less than the required three concepts which were marked on pro-rata basis. However,

Expected response:

- Sketch three different ideas for maximum marks showing high quality sketches.
- Using wide range of enhancement techniques with colour or other forms of highlighting.
- Clearly represent the materials and material texture.
- With clear annotation and details to provide information on the nature and detail of each design idea.
- Ideas should meet the given design brief and the specifications listed in (a).
- Use the joints given in question (b).

Common mistakes;

- Some candidates sketched only one or two ideas.
- Others failed to represent their ideas properly as they were poorly sketched and they lost valuable marks.
- While others failed to enhance their ideas but they only covered them with colored pencil.
- Quite a number of candidates did not include dimensions/sizes when adding their annotations while others sketched ideas that did not meet the given design brief.
- Others did not show or tell how the ideas parts joined.
- Some did not show how the 3 ideas are stored.

(d) Candidates were required to evaluate their ideas and justify why they have chosen one idea to develop it more fully.

Comments: Majority of candidates were able to select their preferred idea and gave a clear justification for their choices.

Expected response:

- Evaluate all three ideas by giving **one** advantage and one disadvantage for each and every idea.
- Select the chosen idea and justify why it has been chosen.
- Candidates included comments which showed valid judgments rather than just simple descriptions of each design idea.

Common mistakes:

- Some candidates were writing more than one advantages or disadvantages which made them to run short of them when getting to the next idea.
- Repeating some of the advantages stated on the evaluations led some to loose valuable mark
- Some candidates used the justification which say they chose a particular idea because it meets all specifications and they lost some marks.

(e) Candidates were to draw a full solution of the chosen idea, include construction details and major dimensions.

Comments; Candidates were at liberty to use any drawing method to produce a full solution to the given problem as long as they provided the required constructional details and dimensions.

Expected response:

- Candidates were expected to draw a high standard of drawing preferable a 3d drawing showing a range of techniques that shows clearly all the details of joining the different parts.
- Show at least three overall dimensions and add more additional dimensions that may show thicknesses, diameters and depths. Also show all constructional details with good annotation and additional drawings as necessary.

Common mistakes

- Very few candidates were able to produce high standard of drawings
- Did not use wide range of enhancing techniques some
- Some did not add the constructional details in the form of sketches or in written annotations.
- Some only showed the three overall dimensions only with no detail dimensions, in that way they lost valuable marks.

(f) Candidates were to suggest two suitable materials for their solutions and give reasons for their choices.

Comments: Many candidates appropriately selected specific materials for their design presented in the previous section, although some were just naming irrelevant materials to their designs. Very few candidates gave generic responses such as wood/metal/plastic, such responses were not awarded marks.

Expected response:

- Give a suitable materials and reasons for the choice.
- Give sound reasons for the choices, that indicates candidate consideration of the structure of his/her design and are familiar with the strengths and weaknesses of the specific materials in context.

Common mistakes;

- Some candidates gave irrelevant materials such as card which cannot perform the storage task.
- Others gave reasons that did not match the material stated and they lost some marks.

(g) Candidates were to outline a method that could be used to manufacture one part of their solution in a school workshop.

Comments; this question was poorly performed by majority of candidates.

Expected response;

- A detailed/step by step description of manufacturing one part including appropriate method and tools used.
- Responses to this part needed to include details beyond general marking out and preparation methods done to any product part.
- Other details such as shaping, marking and cutting of joints to the selected part till it is ready to be assembled to the other parts is very much needed, also showing the tools used.
- The use of simple drawings in addition to written text was generally successful.

Common mistakes;

- Majority of candidates did not state the method of manufacture and they lost valuable marks.
- Some stated a joint instead of a method of manufacture.
- Most candidates gave scanty description of the processes through annotated sketches.

EGCSE DESIGN AND TECHNOLOGY

Paper 6902/02

Graphic Products

Key messages

- The focus of this assessment is Graphic Products. Candidates benefit from the practical activities based on the questions contained in this paper.

General Comments

In this component, candidates were required to answer all **three** questions in Section A (A1, A2, and A3) and then proceed to answer either **B4** or **B5** from Section B. there were 491 candidates who opted **question B4** and 59 who answered **question B5**.

As noted in previous reports, there are areas in the syllabus that educators need to pay special attention to, such areas are proper application of geometric construction, drawing of center lines, projection lines, and use of the folding lines, correct orientation of drawings in pictorial drawings and the correct method of projection views in orthographic projection.

Comments on Specific Questions Section A

Question A1 compulsory question

Sisonke lodge direction sign**.**

Candidates were required to complete the full size of the sign started on the answer sheet to include;

The missing part of the sign

Adding letters; **A, T** and **Z**.

Comments: most candidates had a problem with the construction of the arrow geometrically, otherwise with the printing of the letters they did very well.

Expected responses:

- Use geometrical construction to draw the missing arrowhead
- draw the missing letters as they are shown using same font style
- spacing and height as the given letters

Common mistakes

- drawing the missing arrow without using geometrical construction
- wrong spacing especially when printing letter **A**

Question A2

Second compulsory question.

Orthographic views of a coffee table.

Candidates were required to draw a one-point perspective of the coffee table.

Name one advantage of perspective drawing compared to other 3d drawings.

Comments; Most candidates were able to interpret the orthographic views of the coffee table and manage to come up with perspective drawing.

Expected responses:

- draw radial lines from VP to the X-X as the foreground
- correct height, width and length of the coffee table
- correct front, plan and end in perspective

Common mistakes;

- not using the given vanishing point
- failing to give the correct measurements
- giving wrong views

Question A3

Last compulsory question.

Sisonke Lodge's founder monument with geometrical shapes

Candidates were required to complete the drawing of the monument using scale 2:1.

Comments; Quite a number of candidates were able to construct the polygon but failed to draw the outline of the human head.

Expected responses:

- accurate regular heptagon
- accurate human head profile
- accurate neck
- construct a tangent for the head top and back of the head

Common mistakes;

- failing to construct the chine
- could not find the centre of the R12 chine arc
- failed to follow measurements especially the size of the neck and the R48 for back of the head
- did not see that the top line of the head is a tangent to the R48 so they could not construct the tangent

Section B - two optional questions

Question B4

House model.

This question was from an actual 'Graphic Product' was attempted by 491 out of the 550 graphics candidates.

Candidates were required to draw a development (net) of the house model.

Comments: most candidates were able to come out with the net or development of the model although the question had no measurements, they took them from the given drawing. They were very few candidates who could not produce a correct development.

Expected response:

- draw the seven panels to show the spread card of the house model which includes all the sides, roof and the base
- represent all folding lines with hidden detail lines or centre lines
- show all the nine glue tabs
- represent the three windows

Common mistakes:

- failing to count the panels
- not taking measurements from the given drawing
- folding lines represented with solid lines or construction lines
- not showing all the glue tabs

Question B5

Sanitizer stand parts to be assembled

This question was also derived from a real 'Graphic Product' and it was the least popular question as they were only 59 candidates who opted for it.

Front view

Candidates were required to draw the assembled front and a plan views of the sanitizer's stand.

Comments; Most candidates who tempted this question managed draw only one view because the question had no scale therefore the given space could not fit both views.

Expected response;

- show base of part B
- draw upright of part B
- draw upright of part A
- draw the pedal
- draw the holder

- draw the spring in position
- show the spring guide
- parts fitting/assembled as required
- line quality

Common mistakes:

- failing to assemble
- failing to draw the parts in correct positions

EGCSE DESIGN AND TECHNOLOGY

Paper 6902/03
Resistant Materials

Key massages

- Candidates need to read questions very careful and have a clear understanding of what the question requires of them before attempting an answer.
- For candidates to achieve good marks for Section A, they need to develop a wide knowledge and understanding of materials, tools and processes used when working with wood, metal and plastic.
- Candidates need to improve their communication skills especially in section B. They must try to provide clear sketches when answering questions that start with the statement: ***Use sketches and notes to***… In addition, notes should enrich and make clearer what has been drawn and not just to simply state the obvious. It is vital that candidates **do provide sketches** with notes otherwise they deny themselves access to maximum marks.

General Comments

This paper consists of two sections, Section A and Section B. Candidates were required to answer all questions in Section A and then proceed to answer Questions**11, 12 or 13**. Most candidates in all centres followed the instructions. Candidates still showed challenges in understanding and execution of basic skills and technique in working with materials. When showing processes using sketches and notes, they should show the correct tools used to carry out the tasks including the holding and supporting tools.

Section A

This section testing knowledge and understanding is concerned with materials, tools and processes used when working with plastic, metal and wood. The syllabus requires that candidates should have an all-round knowledge and understanding of the three content areas named herein to perform well in this Paper.

Comments on Specific Questions

Question 1

Candidates were required to state two safety precautions to be observed in order to avoid getting caught when using centre lathe.

Comments: well answered question.

Expected response:

- Tuck in neck-tie
- Roll up sleeves
- Wear apron

Common mistakes: stating any general safety not related to the tangled by the centre lathe **such as;**

- Were goggles
- Put on dust musk
- Secure your work
- Know emergency stop button

Question 2

This question showed stamp body made of wooden knob, acrylic body and a rubber base. Candidates were required to:

(a) Name two tools that could be used to bent the acrylic body.

Comments: most candidate were able to give only one tool correctly some did not get even one.

Expected response:

- Bending former/jig
- Oven/strip heater

Common mistakes; most candidates were stating a hot air gun and a strip heater which are both for softening the plastic they did not include the former for shaping the acrylic, they were given one mark.

(b) Candidates were required to name the machine used to shape the wooden knob

Comments: very few candidates were able to get this question correctly**.**

Expected response:

- Wood turning lathe.

Common mistakes; most candidates were leaving it blank or stat any cutting tool they remember.

(c) Candidates were to give a suitable method of joining the following parts together.

(ii) Knob to body

Expected response

- Screw/screwing

(ii) Base to the body

Expected response;

- Contact adhesives

Common mistakes;

- (i) riveting
- (ii) cold glue

Question 3

This question required candidates to complete a part list table of a lifting device given its dimensions.

Comments: very few candidates manage to fill the part list table correctly, very few had an idea of what was required.

Expected responses:

Part	Material	Length	Width	Thickness
Frame	Mild steel	**225**	40	5
Arm	Mild steel	70	50	5
Screw	Mild steel	160	**M10**	x

Common mistakes

- Length of the frame 140 instead of the 225, candidates did not add the 140 , 50 and the 35 to get the 225
- some candidates left it blank

Question 4

This question required candidates to

Comments: well answered question

Expected response

Material	Classification
Brass	Non-ferrous alloy
Acrylic (Perspex)	**Thermoplastic**
aluminium	**Non-ferrous metal**
Polyester resin	**Thermosetting plastic**
Saligna	**Hard wood**

Common mistakes:

- polyester resin – thermoplastic
- Saligna – soft wood

Question 5

Candidates were asked to name and give the use of the two given fittings.

Comment: Majority of candidates were able to name one of the two fitting especially the hinge but very few could remember its use. Very few candidates got the name of the catch correctly and it function this led to a loss of valuable marks.

Expected response:

- Tee hinge – for out-door, gate, shed door
- Ball-catch – for locking/securing cabinet door

Common mistakes:

- Butt hinge – for mounting door to a frame.
- Most left it blank – for drawers.

Question 6

Candidates were explaining why a centre-punch is used before drilling a hole on a piece of metal.

Comment: well answered question.

Expected response:

- Locate where to drill
- To prevent the bit from wandering
- Give the bit a start

Question 7

Candidates were to explain the reason of applying paint on a finished product.

Comments: well answered question.

Expected response:

- To prevent rusting on metal
- Protect surface
- Improve appearance
- Improve durability

Common mistakes:

- No mistakes.

Question 8

Candidates were to give a reason of using a ring spanner over an adjustable spanner when fastening bolt and nut;

Comments**: well answered question**

Expected response:

- Provide better grip
- Do not damage the bolt head/nut

Question 9

Candidates were to name the three different types of drilled holes given in fig, 3.

Comments: most candidates managed to give the first two holes and miss the third one which made them to score two out of the three marks.

Expected response:

- Hole B – countersink hole
- Hole C – counter-bore hole
- Hole D – through hole/clearance hole

Common mistakes:

- Hole B – no mistake
  - Hole C – countersink hole
  - Hole D – pilot hole

Question 10

(a) Candidates were required to name one suitable plastic that can be used to manufacture the kettle shown in fig. 4.

Comments: quite a number of candidates were able to get this question correctly.

Expected response.

- Polypropylene/PP
- Polyethylene/PET
- Acrylonitrile butadiene styrene/ABS

Common mistakes:

- Acrylic

(b) Candidates were to name a method used to manufacture the kettle body.

Comments Most candidates were able to give one correct advantage.

Expected response:

- Injection molding

Common mistakes:

- Vacuum forming
- Press forming

Section B

Question 11

This question was the most popular question as there were 468 candidates who answered it out of 512 candidates.

A side table.

(a) Candidates were required to name one hard wood suitable to make the side table.

Comments; well answered question.

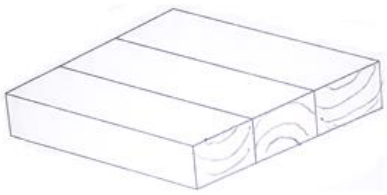
Expected response;

- Hard wood - Saligna/meranti/mahogany, etc.
- Reason – easy to work, available, easy to finish.

(b) (i) Candidates were required to show how the end grain of the top is to be arranged when joining edge to edge.

Comments: well answered question.

Expected response:



Common mistakes

- The annual rings facing same direction.

(ii) Candidates were to name two other types of edge to edge joints.

Comments: most candidates were able to get one out of the two marks.

Expected response:

- Tongue and groove/loose tongue and groove
- Dowel joint/rebate/ slot screw joint.

(c) (i) Candidates were required to use sketches and notes to show how the top could be cut to round shape and have smooth edges.

Comments: Quite a good number of candidates managed to show how the round table top is produced.

Expected response:

- Show holding method
- Waste removal using appropriate method
- Smoothing the edges
- Relevant annotation

(ii) Candidates were to give two disadvantages of using solid wood over other manufactured boards.

Comments: a good number of candidates managed to come with one correct disadvantage.

Expected response: any two of

- Liable to warp
- Expensive/rare to find hard wood manufactured board around.

(d) (i) Candidates were to give two features of the table that makes it suitable for its use

Comments: Most candidates were confused as the question referred to fig. 6 which was showing the waste of the table top instead of referring to the side table in fig.5. Therefore, their responses were not accurate and some left it unanswered.

Expected response: any **two** of;

- The table size/ type of material/ finish/ strength

(ii) Use sketches and notes to show how the top could be fixed to the frame.

Comments: this question had no space to make the sketches when answering this question, majority of candidates were confused and decided to leave this question.

Expected response

- Sketch showing appropriate method e.g. Pocket screwing/button
- Annotations.

(e) Candidates were to list two different possible types of suitable joints for corner A.

Comments; well answered question.

Expected response:

- Angle bridle/mortice and tenon/dowel joint

(f) Candidates were required to sketch the leg modification.

Comments: well answered question as all candidates manage to get good marks on this question,

Expected response:

- Show improvement of the rectangular leg.

Common mistakes:

- Some came with a different leg altogether not improving the shape of the given one.

(g) Candidates were required to list two different types of suitable joints for corner A instead of asking candidates to give a suitable finish and reason for that finish.

Comments: some candidates managed to give a suitable finish and a valid reason while the majority got confused by this question.

Expected response:

- Type of finish - paint/stain/varnish
- Reason – improve appearance/protect the table/prolong life span of table.

Question 12

This question was the least popular question as there were 23 candidates opted for it out of 512 candidates.

A device used to attach a hand sanitizer made from steel.

(a) (i) Candidates were to name a specific suitable steel for the device.

Comments: Most candidates were able to give relevant steel which made them to get the mark.

Expected response:

- Name - mild steel/stainless steel
- Reason – strong and easy to shape if mild steel/ does not corrode, rust free if stainless steel.

Common mistakes;

- none

(ii) Candidates were required to describe one feature of the device that makes it suitable for the use.

Comments: well answered question.

Expected response:

- Size of the device/its strength/mechanical advantage

(b) Candidates were to give one setting/marking out tool and one cutting out tool used in the initial stages when making the device.

Comments: well answered question.

Expected response:

- Setting/marking out tool – engineers square, steel rule and scriber.
- Cutting out tool – hacksaw/file/jig saw

(c) (i) Candidates were required to use sketches and notes to show how to remove waste indicated 'C' on part 'A' of the device in fig.8.

Comments: most candidates were able to get good marks on this question very few got less than three marks.

Expected response: sketches showing:-

- Holding workpiece when working on it
- Drilling for the saw blade used to remove the waste
  - Waste removal
  - Smoothing the rough sawn surface by filing
  - Relevant notes

Common mistakes:

- Work without saying anything about work held securely.
- Sketches that are not clear.

(ii) Candidates were required to show by sketches and notes how to drill and tap the M6 threaded hole for the adjusting lever.

Comments: this question was poorly done as most candidates had no idea of what was required of them as they were not giving what was needed.

Expected response: sketches showing:-

- Workpiece securely held
- Drill taping hole
- Cut the internal threads tap held with tap wrench
- Notes.

(d) (i) Candidates were to use sketches and notes to show how the riveting process of part 'B' using Ø6 mm snap head rivet with opposite side of rivet flushing with the surface.

Comments: most candidates got two out of six marks as the question was poorly done.

Expected response: sketches showing:-

- 4 holes drilled on top plate and one drilled on the other plate in position and countersink
- Rivet one rivet
- Drill three holes of the bottom plate through the holes of the top plate
- Rivet the other three holes
- Draw file the countersunk part
- Notes

(ii) Candidates were asked to give two reasons of using flux when brazing.

Comments: Most candidates had no idea of a flux which made them to lose those marks.

Expected response:

- To clean joint
- Prevent oxidation

(iii) Candidates were required to name two alloying metals used to make brazing spelter.

Comments: this question was poorly done majority of candidates lost these marks.

Expected response:

- Copper
- Zinc

Question 13

This question was also not popular as there were 23 candidates who opted for it.

Figure 9 had a 500 x 300 mm gold fish observatory fish tank made from clear plastic:

(a) (i) Candidates were required to name one suitable plastic and a reason for the choice.

Comments: well attempted question.

Expected response:

- Plastic – acrylic
- Reason – glass clear, durable. Stiff, hard, non-toxic, resist water

(ii) Candidates were required show by sketches and notes how to prepare and glue parts together and state the type of glue used.

Comments: Majority of candidates were able show the parts glued together but there were very few who got maximum marks.

Expected response: sketches showing:-

- Preparation for assemble/pre-assemble/dry assemble
- Clamping method
- Tensol cement stated
- Relevant notes

Common mistakes:

- Using inappropriate clamping methods such as G-cramp
- Not stating the type of glue used

(b) Candidates were required to list the stages of producing the tank when it is vacuum formed.

Comments: majority of candidates were able to list the vacuum forming stages.

Expected response:

- Clamp plastic in position
- Heat the plastic to soft
- Raise the platen
- Suck/vacuum form
- Trim out the waste

Common mistakes:

- Heating the plastic with heat gun
- Describing press forming
- Not trimming the waste

(c) (i) Candidates were to name a correct sheet of metal suitable for making the pastry cutting device shown in fig. 10.

Comments: well answered question.

Expected response:

- Copper/brass/tinplate/stainless steel/aluminium

Common mistakes:

- Mild steel

(ii) Candidates were to name the tool used to cut the required piece from a large sheet of steel.

Comments: very few candidates got this question correct.

Expected response:

- Guillotine/tinsnips

Common mistakes:

- Hacksaw

(c) (i) Candidates were to show by sketches and notes how the safe edge at the top of the cutting edge could be formed.

Comments: candidates lost marks for not showing the appropriate bending method which made them to lose some marks.

Expected response: sketches showing

- Folding bar held in a vice
- Bending force using soft hammer/mallet
- Close down using mallet or tinmen hammer
- Relevant annotations

Common mistakes:

- Not stating the holding device
- Showing ballpein hammer as bending force without showing or stating protecting the surface.

(ii) Candidates were required to show by means of sketches and notes how to bend the sheet metal into a cylindrical shape

Comments: Most candidates were not able to show how to bend the metal sheet into a cylindrical shape.

Expected response:

- Relevant sketches
- Bend on round former
- Relevant notes
- Common mistakes:
- Bending on an anvil beak

(b) (i) Candidates were to complete the sentence to state the composition of a soft solder.

Comments: majority of candidates did not have any idea of alloying elements of a soft solder and they lost good mark.

Expected response:

- Tin and lead

Common mistakes:

- Leaving a blank

(ii) Candidates were sked to give two purposes of an active flux when soldering a joint.

Comments: most candidates had no idea about soldering that is why they could not get marks on active flux.

Expected response:

- Clean joint
- Protect joint

(ii) Candidates were to name the tool used when applying soft solder on the joint.

Comments: poorly performed question.

Expected response:

- Soldering iron/bit

EGCSE DESIGN AND TECHNOLOGY

Paper 6902/04
Project

Coursework

Design and Technology Paper 4 is a coursework paper and a school-based component of the syllabus that is compulsory to all candidates registered for Design and Technology. Each candidate undertakes a personally identified project centred on the given theme. The project is worked over the terms of the course, then submitted for marking. Teachers carried out the assessment of work as markers and as internal moderators for only one criterion (Product Realisation). This time around (1092) students were registered compared to (1005) from the previous year 2023.

Candidate's folders were presented for marking. There was an increase of one hundred and fourteen (114) centres compared to one hundred and three (103) centres who were registered in 2023. Of the centres, one thousand and ninety two (1092) candidates were registered, one thousand and thirty six (1036) candidates submitted work for this year's examination. However, there was a serious concern of fifty-six (56) candidates who were registered but could not submit work for 2024 coursework examination.

General Comments

Generally, the 2024 overall performance indicated a decline when compared to the previous year 2023. The work presentation displayed on the folios indicated a decline on performance from both teachers and candidates. Most candidates seemed to have been misguided towards understanding the syllabus requirements. Most of the projects proved to be pre-conceived and did not follow the given **theme**. This resulted to candidates losing a lot of marks.

Folios

It was good to note that all centres used the correct folio paper size. Folios were graphically presentable on A3 size paper and easy to read and to follow, except for a few centres that submitted folios with very small fonts while there was ample blank spaces. Centres are urged to present portfolios in landscape. Candidates must bind their portfolios neatly and if slide binders are used, it is advisable to **staple** the sheets together before binding. However, the use of a spiral binder is recommended to ensure that no sheets are lost. Centres should arrange their candidates' folios numerically before submitting to Examinations Council.

It was very discouraging to realise a high increase in the number of candidates who did not submit their work Teachers are encouraged to collect work of learners as they complete each stage of the design process to reduce candidates who at the completion of the work are indicated as absent candidates. Some centres did not pay attention to the attendance registers, some registers were missing or wrongly marked.

Comments on specific Assessment Objectives.

Theme analysis

This section was well done by most candidates. Most candidates defined the theme by breaking it down into personal, time and then usage. Some could not define the complete phrase **personal time usage**. Also definitions according to their own understanding not included. At some point sources were not cited. It was encouraging to note that most candidates indicated clear understanding of the theme. Few candidates did not indicate the area of interest in the theme analysis. In some centres candidates provided theme analysis [bubble charts] with limited links (must have at least three links). It was good to note that most candidates did not only indicate the area of interest but also indicated at least **four** general areas.

Identification of the need

Most candidates formulated personally identified problems that were relevant to the theme and successfully completed this objective. Centre assessment of this objective was reasonably accurate although few were not realistic and indicated limited guidance from the teacher. Some centres tended to follow a certain area of need identification such as games, gadgets/ books storages, relaxing seats and picnic equipment. It is however, vital that the identification of a need may be accompanied with the evidence to prove the need to design. Most candidates used pictures to better explain the situation. The user must be considered and it is important to explain how the user is affected in the situation.
Candidates must clearly indicate if the project will be completed as a model or actual product.

Research into the design brief resulting in a specification.

There was a wide range of responses to this assessment objective. Very good work was seen, that demonstrated an excellent understanding of the objective requirement. Few candidates indicated researches that were not relevant to the design brief (mostly research on material). The difference between centres who did the research right and those who didn't was quite noticeable.

Many candidates had evidence of existing ideas, which were downloaded from internet and others in a form of photographs. However, candidates should note that research should have a wide range of existing ideas (**with a minimum of six**). The ideas must not be on a single concept and also include relevant identified and collected data. Most candidates indicated little understanding about the difference between ergonomics and

anthropometric data. Candidates improved significantly in the user research and data presentation. It was good to note that most candidates included the specification in their research which was clear and concise. It is important that the specification is not only specific but also link with the brief analysis and is a conclusion of the research based on the design brief. On the specifications, teachers should assist learners to align their specification items with the analysis. Candidates are encouraged to include the **function** on their specifications. Some candidates seemed not to understand the meaning of researching on existing ideas, as a result they did not analyse and evaluate their existing ideas. **Candidates must be encouraged to collect relevant data as they research which must align with the design brief.** It was noted that there was an improvement in the summarising of findings of the research.

Generation of ideas.

The standard in attempting this objective was low at least 6 design ideas were expected. Most candidates produced a wide range of possible ideas, however some ideas were not developed and evaluated against the design brief and specification. Some candidates' work demonstrated that they lacked drawing skills such as enhancement techniques as a result, candidates reproduced existing ideas while others presented unidentifiable Computer Aided Drawings (CAD) which had optical illusion traits. Few candidates displayed good graphic skills and used pens. Generally, the ideas were well rendered and drawn.

On another note, candidates should be discouraged from drawing ideas that tend to focus on a single concept which also resulted in ideas that are similar to existing products, they must also be discouraged from downloading (cutting and pasting) drawings from internet and use them as possible ideas. They must neatly draw ideas either with a pencil, pen or using CAD. For all CAD drawings candidates must indicate the software they used. Candidates are encouraged to use free-hand sketching when producing ideas, rather than formal drawings, which limits their creativity. In the form of scanning, candidates are also encouraged to produce clear scanned ideas. Some ideas were not easy to read due to poor scanning. Candidates should rather cut and paste the original sketches instead of uploading blurry images.

It is also good to note that almost all candidates were indicating the chosen idea although some were without the selection matrix, justification and the key based on the specification points of the intended product.

Development of the proposed solution

There was decline in most centres in attempting this criterion, this was the most poorly attempted criterion. Candidates lost marks due to insufficient changes in the development of the chosen idea. Candidates must be encouraged to show **at least three changes** for an improvement within the development which should be accompanied by notes justifying the reasons for improvements. It was good to note that some candidates were able to produce appropriate evidence of testing and or trailing resulting in reasoned decision about material, form and construction details. Candidates who did not make mock-ups and tested them, lost marks.

It is advised that candidates make mock-ups, test them and clearly state reasoned decisions about form, materials, construction/production methods etc. Candidates must always draw in full the resultant developed idea.

Planning for production

This objective was surprisingly underperformed by most centres. Exploded views were well attempted by most candidates, candidates must identify and name all parts in this section. Working drawings lacked basic orthographic principles like dimensions, scales and symbols of projection. Cutting lists and part lists were well presented. Production plans were well set up but lacked sketches for the various stages of the sequence. Candidates must avoid inserting production pictures at this stage. The observation with the flow charts is that most learners did not use the correct flow chart symbols but rather meaningless shapes, the flow chart meaningful shapes are found on Microsoft word under shapes-flowchart.

Product Realisation.

For this objective centres are requested to ensure that there is the evidence of the production stages for the prototype. The complete product must also be presented in pictures taken from different views and at least a few to show details of features like joints, links and special details.
The examiners depend on the pictures in awarding the candidates a mark.

There were more problems with this part as it was noted that some teachers were not treating the coursework as an examination. Evidence of candidates' abandonment was noted as some candidates lack marks for this objective. Also some learners did not have evidence of the product but marks were entered into the mark sheet.

Testing and evaluation

Most candidates tested and evaluated their work, although to some candidates the evaluation was not against the design brief and specification, instead they stated general factors about what was done to the product and remarks about problems encountered during manufacture. Few candidates' testing was superficial in that it did not consider the views of the users or show the product in the environment for which it was designed. It is encouraged that testing should be done based on the functionality or intended use of the project, not on measurements of the product; which some centres did. Centres are also advised to encourage candidates to test and evaluate their products against the brief & specification and include modifications and also limitations.

Reminder to centres:

- The use of portfolio templates and duplication of portfolio content among learners remain prohibited and is tantamount to malpractice. Subject teachers are advised to refrain from such malpractice.
- Centres are reminded to ensure that marks are added correctly on the Realisation Summary Form.
- All centres should have products marked and moderated and clearly show the distribution of the teachers mark and the internally moderated mark.

Markers and internal moderators should also consider the following:

- Professionalism must be exercised when marking the realization stage, teachers must do a thorough marking which is fair and just and refrain from deflating or inflating marks.
- Internal moderators should show mark distribution, not just the total. - The teacher teaching the group should **not** mark and do the internal moderation. That is malpractice rather seek help from teachers of neighbouring schools if you are alone in the department.
- Teachers must check if all the documents, (summary sheet and attendance register) are appropriately completed and enclosed inside the provided (ECESWA) envelop before submission.
- Please make a note if a candidate is absent for the exam but does write the other papers.

All centres must adhere to the deadline for submission of folios at ECESWA.