PRINCIPAL EXAMINER'S REPORT

BOTSWANA EXAMINATIONS COUNCIL

BGCSE DESIGN & TECHNOLOGY

2024

Advancing learning, certifying your future

PAPER 1: WRITTEN PAPER

General Comments

This report presents observations made during the assessment of candidates for component 0595/01- Design and Technology theory paper. The report shall also present conclusions drawn on the two aspects, that is, the quality of questions and general quality of candidate responses as observed throughout the assessment procedure. This year, a total of 3086 candidates sat for the Design and Technology theory paper (0595/01), presenting a noticeable decrease from the 2023 candidature.

Some candidates still lack graphical communication skills. This hinders them in questions requiring graphical expression to demonstrate the Design and Technology processes. This type of questions normally allocated more marks therefore the said candidates cannot access total allocated marks.

Centres are advised to train candidates to respect border line on the scripts. Candidates should only write their responses inside the boarder lines. This helps during scanning process of the exam paper as it is Electronically marked. The use of the prescribed HB pencil should also be adhered to.

Instructions

Most candidates followed instructions well by answering all questions in Section A and B. In section C where only one question was to be chosen from three, only a small number of candidates failed to follow the instruction and answered more than one question. This is commendable as it shows an improvement from the previous academic year.

Comments on Individual Items

Section A

1 Question was well answered. Most candidates gave correct safety measures to be observed when carrying out wood chiselling and drilling an acrylic piece.

2 Majority of candidates gave the correct use of the safety equipment presented in the table.

3 Most candidates were able to give correct advantages of both Air Seasoning and Kiln seasoning.

4 This question was not well responded to. Most candidates gave the correct hand tool for cutting curves on wood. Some however struggled with identifying a correct tool for curve cutting a brass sheet.

5 This question was responded to. Most candidates easily classified two plastic types and their examples.

6 Not well responded to. Most candidates gave nonferrous metals that are not alloys. Some candidates struggled with identifying chemical components for alloys.

7 Not well responded to. Most candidates were able to identify the tools illustrated in the table. Some candidates however could not correctly state specific uses for the tools.

8 **(a)** The question was not well responded to. Most candidates incorrectly gave vanish as finish for the wooden vegetable chopping board.

(b) Well responded to. Oil based paint and wood varnish were common responses for finishing a wooden toolbox

9 **(a)** The question was well answered. Most candidates correctly suggested a suitable sheet metal for making the pan.

(b) Well responded to. Most candidates correctly suggested a natural timber for making the wooden handle.

(c) Not well responded to. Most candidates failed to sketch the correct profile of the pan. Some incorrectly presented the profile in 3D, thereby not accessing the allocated marks.

(d) Well responded to. Soldering and riveting were common responses.

10 **(a)** Well responded to. Most candidates clearly articulated plastic properties relevant to the use of the figure in the stem (paint brush holder). Waterproof and chemical resistance were common responses.

(b) Well answered. Most candidates were able to identify correct plastic forming processes. Injection moulding was the common response.

11 Most candidates managed to correctly identify one out of the two expected motions.

12 The question was well answered. Most candidates correctly stated the two types of structures. However, some could only give a correct example to only one type of structure.

Section B

13 **(a)** Well responded to. Most candidates correctly identified the manufactured board expected from the given stem (Fig. 5).

(b) Not well responded to. Most candidates mentioned incorrect marking out tools when showing the process.

(c) Not well responded to. Some candidates omitted important stages like drilling and just went straight to cutting. This therefore led to them not accessing all the allocated marks on the question.

(d) Candidates responded well to this question. Dowel joint and nail/screw reinforced butt joint were common responses.

(e) Candidates did not respond well to this part of the question. In most instances, they omitted to name the cutting out tools used during the process.

(f) Candidates responded well to this question, by stating the correct finish for laminated timber and a reason for their suggestion.

14 **(a)** Candidates responded well to this question. They correctly identified a plastic material to use for making the holder. They also gave a relevant reason for choosing the material.

(b) Well responded to. Candidates identified a correct plastic forming method for the holder.

(c) Not well responded to. Most candidates omitted clamping/holding tools during the laminating process, therefore not accessing all the allocated marks in the question.

(d) Candidates responded well to this question. Vacuum forming was the common process described. When explaining the process, some candidates omitted the stage of 'clamping' of the plastic, therefore disabling them from accessing all allocated marks.

(e) Well responded to. Polyvinyl Acetate was the common response when laminating wood.

(f) The question was well responded to. Candidates correctly stated the holding tool used during lamination process.

(g) Well responded to. Candidates stated an appropriate finish for the laminated timber base.

(h) Not well responded to. Most candidates described the screwing method for joining plastic to wooden base. Most however, omitted the drilling stage in the joining process.

Section C

15 - Structures: *This question was chosen by most candidates*

(a) Well responded to. Most candidates correctly stated factors of consideration when designing the required structure.

(b) Candidates responded well to thus question. They gave relevant materials for the structure supporting them with correct reasons for such choice.

(c) The question was well responded to. Candidates sketched functional solutions for the structure. However, some omitted vital annotations like materials and constructions.

(d) Not well responded to. Most candidates clearly described drilling on the structure including the correct drill bit. They however failed to sufficiently explain drilling on the wall/ floor.

(e) Not well responded to. Most candidates could not explain how their proposed structure would restrict the vibrating machine from moving about.

(f) Well responded to. Candidates were able to identify forces acting on the structure. Compression and Tension were common responses.

(g) Well responded to. Most candidates sketched and annotated different methods of strengthening structures.

16 – Electronics: *A very small number of candidates attempted this question.*

(a) Well responded to. Most candidates correctly identified input and output components for the proposed solution.

(b) Not well responded to. Some candidates' solutions could not show the input and control. Lack of sufficient annotations also hindered candidates from accessing all allocated marks for the question.

(c) Not well responded to. Most candidates confused the layout of electronic components in the circuit.

(d) Most candidates explained the input and output but could not explain the process components.

(e) Well responded to. Most candidates correctly identified possible problems that could arise when using the device.

(f) Well responded to. Candidates correctly suggested possible countermeasures to the perceived problems.

17 – Mechanisms: ***This was the least favourite choice to candidates***

(a) The question was well responded to. Candidates explored varied factors of consideration when designing the mechanical device.

(b) The question was well responded to. Candidates easily identified relevant mechanisms that could be used in solution.

(c) Well responded to. Candidates identified relevant motion that might be involved when using the device

(d) The question was not well responded to. Some candidates' design solution did not include annotations as required by the question.

(e) The question was well responded to. Candidates' explanations included input, control and output.

(f) This was well responded to. Most candidates identified problems that could arise during use of the mechanism.

(g) The question was well responded to. Lubrication and use of washers were common responses.

PAPER 2: COURSEWORK

General comments

The theme for 2024 was TRADING. Candidates were to design and make an artefact that aids in trading. Just like the previous year, this theme allowed candidates to display their creativeness in the projects done. Only few Centres managed to display this creativity by producing a variety of artefacts. Most centres were focused only on displaying when trading. The work was sampled and marked in all centres.

Comments on the Design and Realisation

Theme Analysis

All centres did well in this area. Candidates were able to:

1. Clearly define the theme and state the source.
2. Brainstorm on products
3. Showed colourful paste-ups and descriptions of three products which were related to the theme.

It was evident that candidates were well guided in this area.

Situation

The situations formulated in some centres, were clear and well linked to the theme. However, other centres formulated general statements that lacked a concern.

Problem

Most candidates were able to clearly provide a design problem that linked to the situation. There were a few centres where they formulated more than one problem.

Design Brief

It was well done across the country. Candidates formulated clear statements of intent that linked with the problem.

Specifications

This area was generally well done in most centres. Candidates were able to formulate at least four relevant specifications that would guide them when coming up with possible solutions. It was evident that the assessment guide was used by candidates to guide them when formulating the specifications.

Exploration Of Ideas

In this stage candidates have to analyse one existing idea and sketch two initial ideas that solve the identified problem.

Existing ideas – These were well done in all Centres; however, some candidates were still failing to make comparisons against the design brief as expected by the assessment mark scheme.

Initial ideas – These were well done by candidates in most centres. Sketches used were clear however some candidates failed to describe how each idea functions.

Development

This stage was generally not well done in most centres as compared to the previous year. Candidates were not able to provide sufficient alternatives on construction, justification on choices made. The working

principle of the developed idea was not attempted by most candidates. Presentation drawings were in most cases not correctly rendered.

Working Drawing

This was poorly done by most Centres. It was evident that this stage was rushed. The working drawings produced were lacking in the following details:

- Views were wrongly positioned or not related to the presentation drawing
- Symbol of projection not constructed using drawing instruments
- Use of scale wrongly used
- Another issue that was noted is that in some Centres, the candidates did not attempt this stage of the design process hence resulting in them missing 7 marks.

Production Plan

Material list – This was well done by most candidates as compared to the previous year. Only few learners failed as they lacked reference drawing.

Schedule of Manufacture – The time estimated for the processes was mostly not realistic. The plans were lacking in tools and equipment and some steps of the processes hence making the plan limited.

Sequence – This was generally well done except for few candidates, as they lacked the assembly of all parts.

Communication

Some Centres that had typed their folios, their work was presentable and easy to read. This stage was well done by most candidates except for those who had some stages of the design process missing thus affecting the flow of the folio. They displayed a variety of presentation techniques and good graphical skills.

Manufacturing Skills

The standard of making skills had dropped as compared to the previous year. Technical factors were not considered e.g. correct use of fixings, appropriate use of joining methods etc. Only few Centres displayed making skills to the expected proficiency level. The quality of finish was also poorly done hence this marred the final outcome of the artefact. It was evident that this stage was not given the attention it deserves in most Centres. Other observations made was that almost all Centres were over marking this stage without considering what is required of them from the assessment criteria.

Evaluation

Few Centres did well in this area. They were able to provide evidence of testing on their product and explain how it was done but failed to make conclusions. Most candidates failed to evaluate their products against the design brief and specifications. They were only repeating what they stated in the specifications without explaining how they were met. Modifications made during making and future improvements were well done by most candidates. There were cases where some candidates did not evaluate their artefacts. This affected the awarding of marks in this stage.

General Observations

Observations were made on the following:

1. Centres were deliberately over marking candidates work especially manufacturing skills. Awarding of marks should be aligned with the objectives stipulated in the assessment criteria.
2. There was lack of consistency in marking by some Centres. This affected the ranking order after sampling was done by moderators. These Centres were requested to remark candidates work in order to correct the ranking order.
3. Display of candidates' work was done well by all centres the exception of only one centre. Projects displayed were mixed up and not clearly labelled for easy identification when sampling work to be marked.