PRINCIPAL EXAMINER'S REPORT

BOTSWANA EXAMINATIONS COUNCIL

JCE DESIGN AND TECHNOLOGY

2025

Advancing learning, certifying your future

PAPER 1: MULTIPLE CHOICE

General Comments

The performance of the candidates was stronger compared to that of the previous year with a mean of **21.68** in 2025 compared to **17.09** in 2024. As usual, the performance varied across the items with some having very high proportions of candidates getting the item correct while others had very low proportions. There were some items which showed misconceptions by the candidates, while some clearly showed lack of content mastery on the part of the candidates.

Where misconceptions and lack of content knowledge are evident, such information should be used to improve the teaching and learning. Generally, multiple-choice items have a guessing factor that is considered to be the lowest proportion of being able to get the item correct without knowing the answer. For a Multiple-Choice item with four options, the guessing factor is 25% and any item which has the proportion of candidates who got it correct lower than the guessing factor is a cause for concern. Candidates should be encouraged to always read the question for understanding before they select an answer. The report is mainly in table format, showing the proportion of candidates at each of the options. The key for reading the table:

Prop proportion of candidates that selected the option as their answer

Key the option that was taken as the answer for the item

Comments on Individual Questions

Question 1

Option	Prop.	Key	Comments
A	0.13	D	Fewer than half of the candidates were able to correctly respond to the recall question on types of lines. This points to a need for more reinforcement on core facts.
B	0.25		
C	0.17		
D	0.46		

Question 2

Option	Prop.	Key	Comments
A	0.21	A	Most candidates were unable to recall and identify the correct plastic. This shows significant gaps in understanding basic concepts on working properties of materials.
B	0.33		
C	0.22		
D	0.24		

Question 3

Option	Prop.	Key	Comments
A	0.69	A	An application item correctly answered by majority of candidates. Showing effective application of required knowledge on specifications.
B	0.14		
C	0.07		
D	0.10		

Question 4

Option	Prop.	Key	Comments
A	0.13	C	Most candidates were able to correctly identify the required concept of conversion methods, showing clear understanding with minor gaps among a few candidates.
B	0.04		
C	0.73		
D	0.09		

Question 5

Option	Prop.	Key	Comments
A	0.10	D	A fair performance noted on this item, candidates were able to correctly identify the manufactured board presented.
B	0.11		
C	0.11		
D	0.69		

Question 6

Option	Prop.	Key	Comments
A	0.36	D	A generally weak performance of candidates on this question. Most candidates were not able identify an odd leg calliper basing on its use.
B	0.10		
C	0.30		
D	0.24		

Question 7

Option	Prop.	Key	Comments
A	0.66	A	Candidates were required to identify the name of the tool basing on its use. Most candidates performed well on this question. Approximately one-third of the candidates were struggling with the question.
B	0.15		
C	0.09		
D	0.09		

Question 8

Option	Prop.	Key	Comments
A	0.11	B	A moderate level of performance was noted on this item. A good number of candidates had a reasonable knowledge of the sequence and grades of Abrasives.
B	0.60		
C	0.06		
D	0.23		

Question 9

Option	Prop.	Key	Comments
A	0.20	D	An above average number of candidates were able to correctly answer the application question on the surface preparation steps before varnishing wood.
B	0.04		
C	0.20		
D	0.56		

Question 10

Option	Prop.	Key	Comments
A	0.56	A	Just over half of the candidates were able to identify the classification of a file
B	0.04		
C	0.34		
D	0.06		

Question 11

Option	Prop.	Key	Comments
A	0.11	A	Candidates' performance was significantly low on this question. This indicates lack of understanding of wood finishing materials and their purposes
B	0.69		
C	0.11		
D	0.09		

Question 12

Option	Prop.	Key	Comments
A	0.09	C	Most of the candidates performed well on this item. This showed good understanding commercially available sections of metal.
B	0.07		
C	0.78		
D	0.07		

Question 13

Option	Prop.	Key	Comments
A	0.10	D	This indicated a moderate level of understanding of basic forces with an average number of candidates being able to choose the force that describes squashing force.
B	0.20		
C	0.13		
D	0.57		

Question 14

Option	Prop.	Key	Comments
A	0.27		A few candidates answered the question correctly. Candidates responses showed limited understanding of plane geometry (dividing a given line according to a given ratio.
B	0.26		
C	0.33		
D	0.15		

Question 15

Option	Prop.	Key	Comments
A	0.02	C	Most candidates performed very well on this item. This shows strong understanding of the parts of a lever- indicating clear knowledge of mechanical concepts.
B	0.02		
C	0.90		
D	0.06		

Question 16

Option	Prop.	Key	Comments
A	0.12	D	The performance of candidates on this item was below average. This indicated limited understanding of basic requirements for marking out on a flat wood surface.
B	0.06		
C	0.47		
D	0.34		

Question 17

Option	Prop.	Key	Comments
A	0.21	B	Quite a few candidates correctly answered this item about the use of a tang on a file. Most candidates were unable to correctly identify the function of a file tang.
B	0.38		
C	0.16		
D	0.24		

Question 18

Option	Prop.	Key	Comments
A	0.19	B	The performance of candidates on this item was below average. Many candidates showed difficulty in identifying the correct method of constructing a 30 degrees angle.
B	0.48		
C	0.12		
D	0.21		

Question 19

Option	Prop.	Key	Comments
A	0.04	C	Most candidates performed well on this item. Candidates demonstrated sound knowledge of correct safe workshop practices (Why a work piece has to be clamped when drilling)
B	0.07		
C	0.79		
D	0.10		

Question 20

Option	Prop.	Key	Comments
A	0.69	A	Most candidates performed well on this question. They were able to identify the correct electronic symbol for a Light Emitting Diode.
B	0.09		
C	0.17		
D	0.06		

Question 21

Option	Prop.	Key	Comments
A	0.16	C	Quite a small number of candidates were able to identify the appropriate mechanism used for automatic sliding gates.
B	0.26		
C	0.25		
D	0.33		

Question 22

Option	Prop.	Key	Comments
A	0.05	D	Most candidates performed well on this item. Showing good understanding of suitable methods for joining mild steel.
B	0.14		
C	0.07		
D	0.73		

Question 23

Option	Prop.	Key	Comments
A	0.36	D	A low performance was noted on most of the candidates. This showed limited understanding of adhesives for joining rubber to metal.
B	0.15		
C	0.17		
D	0.32		

Question 24

Option	Prop.	Key	Comments
A	0.30	A	Most candidates showed limited understanding of chisel used for finishing dovetail joints. There is need for greater emphasis on tool selection for specific woodworking tasks.
B	0.20		
C	0.36		
D	0.14		

Question 25

Option	Prop.	Key	Comments
A	0.09	D	Most candidates performed well on this item by selecting the correct statement about energy conservation at home.
B	0.05		
C	0.07		
D	0.79		

Question 26

Option	Prop.	Key	Comments
A	0.12	C	Most candidates answered this question correctly, selecting the correct order of steps to follow when constructing the square.
B	0.07		
C	0.62		
D	0.18		

Question 27

Option	Prop.	Key	Comments
A	0.68	A	Most candidates performed well on this item, showing moderate understanding of basic marketing principles.
B	0.18		
C	0.08		
D	0.06		

Question 28

Option	Prop.	Key	Comments
A	0.05	B	Less than half of the candidates were able to correctly answer this question, identifying the type of pictorial drawing represented.
B	0.47		
C	0.36		
D	0.11		

Question 29

Option	Prop.	Key	Comments
A	0.63	A	More than half of the candidates were able to correctly answer this item, which required the mail role of research in the design process.
B	0.22		
C	0.11		
D	0.05		

Question 30

Option	Prop.	Key	Comments
A	0.60	A	Most candidates answered this question correctly, demonstrating a reasonable understanding of materials suitable for making a model of the sketched bridge.
B	0.22		
C	0.05		
D	0.13		

Question 31

Option	Prop.	Key	Comments
A	0.88	A	Quite a good number of candidates correctly answered this item. This demonstrated a strong understanding of the use of electricity.
B	0.06		
C	0.03		
D	0.03		

Question 32

Option	Prop.	Key	Comments
A	0.10	B	Misunderstanding of the drilling process, tools and machines shown by many candidates as they were unable to answer this item.
B	0.34		
C	0.37		
D	0.19		

Question 33

Option	Prop.	Key	Comments
A	0.15	B	Just over half of the candidates showed knowledge of how a gear train works.
B	0.56		
C	0.10		
D	0.19		

Question 34

Option	Prop.	Key	Comments
A	0.51	A	An average number of candidates were able to correctly calculate the voltage given the current and resistance.
B	0.23		
C	0.15		
D	0.11		

Question 35

Option	Prop.	Key	Comments
A	0.08	D	A fair knowledge of matching materials with their sources was shown by an average number of candidates.
B	0.67		
C	0.06		
D	0.20		

Question 36

Option	Prop.	Key	Comments
A	0.23	B	An average number of candidates showed knowledge of the correct tools for driving hexagonal bolts.
B	0.51		
C	0.11		
D	0.16		

Question 37

Option	Prop.	Key	Comments
A	0.07	D	Most candidates performed well on this question. This suggests a strong knowledge of common holding tools.
B	0.04		
C	0.06		
D	0.82		

Question 38

Option	Prop.	Key	Comments
A	0.35	A	Most candidates struggled with this question. This showed limited knowledge of different mechanical systems.
B	0.24		
C	0.30		
D	0.10		

Question 39

Option	Prop.	Key	Comments
A	0.25	C	Most candidates demonstrated a good knowledge of drawing techniques.
B	0.05		
C	0.66		
D	0.04		

Question 40

Option	Prop.	Key	Comments
A	0.18	B	Most candidates were unable to identify the correct orthographic projection of the given block.
B	0.32		
C	0.32		
D	0.18		

PAPER 2: WRITTEN THEORY

General Comments

Generally, this year's cohort showed a slight improvement. with candidates' responses were stronger than those of the previous year, for both application, knowledge and understanding questions. Most candidates were able to access marks on high order questions. Items on graphical applications were well answered, especially on section B (problem solving). Most candidates were able to sketch ideas though they showed challenges in annotation of their sketches. Centres are encouraged to use this report as a reference point for identifying areas of improvement.

Comments on Individual Questions

Section A

1 Most candidates were able to define / provide the definition of the term energy.

2 Candidates were able to give the hinge (back flap hinge) though there were a few candidates who confused back flap hinge with Butt hinge.

3 Most of the candidates were able to state the different grades of abrasives in their order. Only a few stated the types of abrasives instead.

4 Candidates were able to explain the two terms correctly by also providing correct definitions.

5 The question was well done, with most candidates being able to state that copper is a good conductor of electricity

6 Most candidates responded correctly. Candidates were able to state leather as an additional material obtained from skin.

7 Most candidates stated the correct mechanism (lever). However, there were few who wrote gears or linkage as answers.

8 Most candidates stated the correct differences between Temporary joints and permanent joints. Dominant responses and correct responses were -easily dismantled and not easily dismantled. A few wrote, last longer. Which does not show any difference as it applies to both types of joints.

9 The question was well done by most of the candidates as they were able to identify and state the correct name of joint (dowel joint).

10 Most candidates were unable to sketch the circuit using component symbols, instead some candidates duplicated the layout of the circuit rather than using the correct conventional method. Candidates could not differentiate between the Ammeter and Voltmeter.

Section B

11 **(a)** The question was well done, with candidates being able to write the correct materials. (SAP prevailed as the answer).

(b) Most candidates wrote the correct materials and acrylic was mostly stated.

(c) Candidates stated the reason for choosing the material. However, some candidates stated properties which were too general (example: easy to work) and not linked to the reason for choice.

(d) The process of measuring and marking out with correct tools was correctly done. The bending process through heating was correctly done, but candidates were unable to include formers.

12 **(a)** Most candidates were able to identify one hazard of falling plates from the side. However, some stated types of hazards instead.

(b) Candidates were able to state the elements of specification correctly. (size, function, materials, finish, construction methods)

(c) Most candidates came up with a completely new design instead of improving the dish rack which was shown. Nevertheless, most of the candidates were able to correctly state the appropriate materials, construction and safety.

13 **(a)** A significant number of candidates were able to state the correct mechanism; gears / bevel gear or pulley.

(b) **(i)** Correct and relevant wooden materials were stated by most candidates.

(ii) relevant reasons were given for the stated wood.

(iii) Appropriate finish was also correctly given.

(c) Most candidates were unable to draw gears which could produce the desired output. They also failed to sketch appropriate construction details for their ideas. They failed to show attachment to the body and the blades of the helicopter. Candidates could not explain how the gears would make the blades of the helicopter turn.

14 Candidates were able to come up with a 3D drawing with 6 to ensure the correct function of their idea. However, some candidates generated sketches which were a combination of 3D & 2D, this showed the need for assistance on Graphics (esp. Isometric projection). Most candidates were able to show correct materials, appropriate construction details, relevant finish and address the safety aspect of the products. An average number of candidates were unable to dimension their products according to the intended function (they indicated dimensions which did not give allowance to store the 6 surforms inside the product).

PAPER 3: COURSEWORK

General Comments

This report outlines the observations made during the external moderation of the 2025 Design and Technology Paper 3, conducted from November 4 to November 29, 2024. It explores the approaches taken by Centres toward portfolio development and product manufacturing skills. Additionally, it discusses project handling and compares the internal and external application of the assessment criteria.

An improvement in the overall candidate performance was noted in the 2025 cohort, with candidates demonstrating enhanced creativity, analytical and problem-solving skills.

Comments on Project Work

Theme Analysis: All candidates were able to select three aspects from the list provided in the question paper. They pasted relevant illustrations and gave clear explanations by stating the names of the products and relating them appropriately to the given theme. The Examination of the Area of Interest was correctly done. However, in some centres, the methods or ways were omitted due to the restrictive nature of the templates provided by centres. This limited candidates' creativity.

Situation: Candidates provided clear and real-life statements of the situation that were relevant and directly related to their chosen areas of interest.

Problem: The problem statements presented were clearly derived from the design situations. However, a few candidates simply repeated the situation statements or provided multiple problem statements, which affected clarity.

Design Brief*:* Candidates provided relevant and concise statements of design briefs that addressed the identified problems.

Specifications: The statements clearly reflected the design intentions and offered useful guidance for the design activity; however, several candidates were unable to adequately justify their statements.

Exploration of Ideas

Candidates were able to present relevant existing ideas, but the analysis predominantly focused on function, overlooking other important aspects such as materials and construction methods. Candidates also presented a range of initial ideas to address the identified problems. Although appropriate initial ideas were generated and demonstrated through good sketching techniques, the justifications for the selected ideas were not clearly articulated.

Development of Chosen Idea

A range of possible shapes and forms was explored, supported by relevant alternative materials and construction methods. However, most candidates did not clearly exhibit informed decision-making when selecting their final choices from these alternatives. While candidates produced good pictorial drawings, they were generally unable to apply correct rendering techniques.

Working Drawing

Orthographic projections presented did not adhere to conventional drawing methods, and several working drawings were completed freehand, which did not meet the expected standard.

Production Plan

Most candidates presented materials lists with all parts and reference points, although some contained incorrect dimensions. The tools listed were generally suitable and sufficient to manufacture the intended products, even though there were a few presentations of unrealistic plans. Generally, most of the production plans were sequential and adequate, reflecting a reasonable understanding of product production planning.

Presentation

Candidates displayed commendable graphical presentation skills, complemented by clear and effective written communication with stages presented in a logical sequence. Pages were orderly numbered to match the table of contents. However, some portfolios were not neatly bound, and some pages easily fell out.

Manufacturing Skills

Candidates exhibited good manufacturing skills, employing suitable construction methods and generally observing safety requirements. Most products were aesthetically appealing and showed good finishing techniques. However, in some centres, several candidates had not completed making their products.

Suitability For Purpose

The products produced fulfilled the requirements of the design brief and met most of the specifications set out by most candidates.

Use of Materials

Candidates selected and utilized materials which were well suited to their design intentions.

Evaluation

Candidates judged their products against the design brief and specifications. Product functionality was also addressed; however, objective testing was limited or absent by most candidates. In a few Centres, photographs were used as evidence of testing activities. An average number of candidates were able to acknowledge modifications made, and recommendations for future improvements were included.

General Comments

Reception at the Centres

Overall, most Centres demonstrated cooperation during the moderation exercise. However, there were concerns regarding inadequate reception arrangements, as moderators experienced delays due to the absence or unavailability of Chief Invigilators who were engaged in conducting Junior Certificate Examinations.

Display

Most centres were adequately prepared for external moderation. However, in a few instances, projects were displayed in dusty rooms that required cleaning while moderators waited. In addition, some centres failed to arrange and number the projects as required.

Centre Marking

Internal marking generally met the expected standard, with marks from most Centres reflecting a good understanding and application of the assessment criteria. Nevertheless, a few Centres showed discrepancies in their marking which could be due to the following:

- Individualised marking practices which lead to inconsistencies in the centre marks.
- Misinterpretation of the assessment criteria.
- Lack of proper standardization.