



THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA



STUDENTS' ITEM RESPONSE ANALYSIS
REPORT ON THE FORM TWO NATIONAL
ASSESSMENT (FTNA) 2025

CIVIL ENGINEERING SUBJECTS
(VOCATIONAL STREAM)



THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA



STUDENTS' ITEM RESPONSE ANALYSIS REPORT ON THE FORM TWO NATIONAL ASSESSMENT (FTNA) 2025

CIVIL ENGINEERING SUBJECTS (VOCATIONAL STREAM)

Published by:

The National Examinations Council of Tanzania,
P.O. Box 2624,
Dar es Salaam, Tanzania.

© The National Examinations Council of Tanzania, 2026

All rights reserved.

TABLE OF CONTENTS

FOREWORD	iv
1.0 INTRODUCTION	1
2.0 STUDENTS' REGISTRATION AND ATTENDANCE	1
2.1 Students' Registration.....	1
2.2 Students' Attendance	2
3.0 GENERAL RESULTS IN EACH SUBJECT	2
3.1 Overall Results.....	2
3.2 Subjects Performance Analysis	2
4.0 ANALYSIS OF STUDENTS' PERFORMANCE IN EACH SUBJECT	3
4.1 Analysis of Students' Performance by Competences	3
4.1.1 Performance in Masonry and Bricklaying	3
4.1.2 Performance in Carpentry and Joinery with Metal Works	4
4.1.3 Performance in Plumbing and Pipe Fitting	5
4.1.4 Performance in Painting and Signwriting	6
4.2 Analysis of Students' Responses by Subject	8
4.2.1 Masonry and Bricklaying	8
4.2.2 Carpentry and Joinery with Metal Works	14
4.2.3 Plumbing and Pipe Fitting	21
4.2.4 Painting and Signwriting	28
5.0 CONCLUSION AND RECOMMENDATIONS	34
5.1 Conclusion	34
5.2 Recommendations.....	34
Appendix I: A Summary of Students' Performance per Competence in Masonry and Bricklaying	36
Appendix II: A Summary of Students' Performance per Competence in Carpentry and Joinery with Metal Works	37
Appendix III: A Summary of Students' Performance per Competence in Plumbing and Pipe Fitting	38
Appendix IV: A Summary of Students' Performance per Competence in Painting and Signwriting	39

FOREWORD

The National Examinations Council of Tanzania (NECTA) has prepared a report on the analysis of students' responses in the Form Two National Assessment (FTNA) 2025, Civil Engineering subjects in Vocational Stream. The report provides an analysis of students' strengths and weaknesses in terms of mastery of the competences, ability to interpret questions' demands and the ability to manipulate practical inquiries. The report aims to provide feedback to education stakeholders and the general public on the factors that contributed to the students' performance in the Civil Engineering subjects.

This report analyses students' responses and therefore presents an evaluation of overall performance, performance by subject, performance by competence, as well as the reasons for the weak and good performance on the questions. Overall, students' performance in the Form Two National Assessment (FTNA) 2025 in the Civil Engineering subjects was good. The good performance was due to mastery of practical skills and hands-on exposure. On the other hand, weak performance in some concepts was due to incorrect interpretation of technical drawings and specifications.

The National Examinations Council of Tanzania (NECTA) expects that all stakeholders will use the feedback provided in this report to take proper measures to improve teaching and learning of the Civil Engineering subjects. Consequently, students will acquire knowledge, skills and competences indicated in the syllabus for their better performance in future assessments and examinations.

The National Examinations Council of Tanzania extends its sincere appreciation to all experts who participated in the preparation of this report.



Prof. Said A. Mohamed
EXECUTIVE SECRETARY

1.0 INTRODUCTION

The Form Two National Assessment (FTNA) 2025 on the Vocational Stream in Civil Engineering subjects was conducted in November 2025. The subjects assessed were Masonry and Bricklaying, Carpentry and Joinery with Metal Works, Plumbing and Pipe Fitting and Painting and Signwriting. Data analysis indicates that, out of 315 registered students, 313 students sat for the assessment which is equivalent to 99.37 per cent.

An analysis of students' performance in Civil Engineering subjects was conducted in accordance with NECTA performance criteria. The four Civil Engineering subjects had two papers each; Paper 1 (Theory) and Paper 2 (Practical).

The purpose of conducting an analysis of performance is to identify the challenges faced by the students in responding to the assessment questions. Thus, the analysis provides feedback to the teachers, students and other educational stakeholders, enabling them to design the appropriate teaching and learning strategies that will help them to attain the intended competences. In addition, these findings will assist them in improving students' performance in future assessments.

2.0 STUDENTS' REGISTRATION AND ATTENDANCE

2.1 Students' Registration

A total of 315 students registered for the Form Two National Assessment (FTNA) 2025 in Civil Engineering subjects in 2025. Among them 64 were females and 251 were males. The analysis of student registration by subject and gender is presented in Table 1

Table 1: Student Registration for FTNA Civil Engineering Subjects, 2025

S/N	Subject Name	Registered for Assessment		
		Males	Females	Total
1.	801 Masonry and Bricklaying	146	50	196
2.	804 Carpentry and Joinery with Metal Works	46	7	53
3.	805 Plumbing and Pipe Fitting	52	7	59
4.	806 Painting and Signwriting	7	0	7
Grand Total		251	64	315

2.2 Students' Attendance

A total of 313 students sat for the Form Two National Assessment in Civil Engineering subjects in 2025. Among them, 64 were females and 249 were males. The analysis of student attendance by subject and gender is presented in Table 2.

Table 2: Student Attendance in FTNA Civil Engineering Subjects, 2025

S/N	Subject Name	Students who Sat for the Assessment		
		Males	Females	Total
1.	801 Masonry and Bricklaying	145	50	195
2.	804 Carpentry and Joinery with Metal Works	46	7	53
3.	805 Plumbing and Pipe Fitting	51	7	58
4.	806 Painting and Signwriting	7	0	7
Grand Total		249	64	313

3.0 GENERAL RESULTS IN EACH SUBJECT

The analysis of the statistical data on the assessment results, both overall and by subject, was conducted to determine the performance levels of the students. The analysis aimed to provide the appropriate advice to the relevant authorities for the necessary action to be taken.

3.1 Overall Results

The general statistics show that, a total of 313 (100%) students passed the assessment. Among them, 64 (20.45 %) students were female and 249 (79.55 %) were male.

3.2 Subjects Performance Analysis

The analysis of student performance in Civil Engineering subjects indicates that, students performed well in all subjects, with a pass rate of 100% in each subject. The detailed breakdown is presented in Table3.

Table 3: Subjects' Performance Analysis in Civil Engineering subjects

S/N	Subject	Sat	Passed	
			Number	%
1.	Masonry and Bricklaying	195	195	100
2.	Carpentry and Joinery with Metal Works	53	53	100
3.	Plumbing and Pipe Fitting	58	58	100
4.	Painting and Signwriting	7	7	100
Total		313	313	100

4.0 ANALYSIS OF STUDENTS' PERFORMANCE IN EACH SUBJECT

The analysis of students' performance in the examined competences and questions for each subject was conducted with the aim of determining the level of performance. The analysis also identifies challenges encountered by students in answering the questions and the corresponding solutions.

4.1 Analysis of Students' Performance by Competences

Performance in each competence was determined based on the per centage of students who scored 30 per cent or more of the marks allocated to the question drawn from that particular competence. The distribution of students who passed was grouped into three per centage categories: 65 –100 (Good performance), 30 – 64 (Average performance) and 0 – 30 (Weak performance). A summary of students' performance on each subject is presented in the Appendix I to IV.

4.1.1 Performance in Masonry and Bricklaying

The Masonry and Bricklaying assessment covered six competences in paper 1 (Theory) and paper 2 (Actual Practical). These competences included: *Maintaining the Safety of the Workshop and Surroundings, Performing Materials Tests, Making Blocks, Bricks and Paving, Constructing Foundations and Walls and Performing Wall and Floor Finishes.*

The analysis of students' performance indicates that students performed well in all competences assessed in papers 1 and 2. In Masonry and Bricklaying 1, the students performed well in the objective question, which consisted of ten items drawn from various competences, namely: *Maintaining the Safety of the Workshop and Surroundings, Performing Materials Tests, Making*

Blocks, Bricks and Paving, Constructing Foundations and Walls and Performing Wall and Floor Finishes (98.46%).

The other competences with good performance include *Maintaining Safety of the Workshop and Surroundings (92.82%), Performing Wall and Floor Finishes (80.26%), Constructing Foundations and Walls (76.16%), Making Blocks, Bricks and Paving (75.64%)* and *Performing Material Tests (67.94%)*. The students who performed well had adequate knowledge and skills in the assessed competences.

On the other hand, the analysis of Masonry and Bricklaying 2 reveals that the competences of *Making Blocks, Bricks and Paving* had a good performance of 100 per cent. Students who attained high marks were able to correctly interpret the given instruction to achieve the desired final product.

Even though students generally performed well in all questions, the performance in the competence of *Performing Material Tests* was comparatively lower (67.94%). To improve performance in this competence, the following measures are recommended:

- (a) Teachers should provide more hands-on practical sessions to allow students to practice different material testing procedures using actual testing equipment.
- (b) The use of demonstrations, diagrams, charts and videos will help students to visualise testing processes and equipment more clearly.

4.1.2 Performance in Carpentry and Joinery with Metal Works

A total of eight competences were examined in the subject Carpentry and Joinery with Metal Works subject. These competences were: *Maintaining Health, Safety and Environment at Workplace and Surroundings, Constructing Simple Furniture, Performing Timber Processing and Treatment, Making Frames, Constructing Wooden Door Shutters and Window Shutters, Maintaining Health, Safety and Environment at workplace, Constructing Simple Roofs and Constructing Temporary Supports.*

The competences *Maintaining Health, Safety and Environment at Workplace and Surroundings, Performing Timber Processing and Treatment, Constructing Simple Furniture, Making Frames, Constructing Simple Roofs, Constructing Temporary Supports*, which were tested in Question 1

(multiple-choice) of Carpentry and Joinery with Metal Works 1 (Theory), had a high pass rate of 88.68% indicating that students demonstrated a strong understanding of basic concepts of the subject Carpentry and Joinery with Metal Works.

Furthermore, the competences *Constructing Simple Furniture* (64.16%), *Performing Timber Processing and Treatment* (58.49%), *Making Frames* (56.60%), *Maintaining Health, Safety and Environment at Workplace* (52.83%), *Constructing Simple Roofs* (45.28%), *Constructing Temporary Supports* (43.90%) tested in Carpentry and Joinery with Metal Works 1

(Theory) show an average performance indicating a fair understanding of the competences, with a need for strengthened instruction and practice to improve performance.

However, the competence *Constructing Wooden Door Shutters and Window Shutters* tested in Carpentry and Joinery with Metal works 2 (Practical) had a good performance in which all students passed, indicating strong practical skills and adequate preparation in this area.

The following are measures to be taken to improve performance in the competence of *Constructing Temporary Support*.

- (a) Teachers should strengthen learners' skills of types, uses and components of temporary supports such as scaffolding, props and formwork.
- (b) Increase guided practical work where learners construct and dismantle temporary supports using correct procedures, tools and materials.
- (c) Emphasize safety practices and correct interpretation of working drawings, in line with competence-based assessment requirements.

4.1.3 Performance in Plumbing and Pipe Fitting

A total of eight competences were examined in the Plumbing and Pipe fitting subject. These competences were: *Maintaining Safety of Workshop Surroundings*, *Perform Bench Works*, *Installing Pipes, Taps and Valves*, *Installing Domestic Water Supply Systems*, *Installing Sanitary Appliances*, *Installing Sanitary Pipework Systems*, *Installing Domestic Gas Supply Systems* and *Performing Sheet Metal Works*.

The performance analysis shows that in Plumbing and Pipefitting 1 (Theory), most students performed well in the multiple-choice question, which

consisted of ten items from different competences including *Maintaining Safety of Workshop Surroundings*, *Perform Bench Works*, *Installing Pipes, Taps and Valves*, *Installing Domestic Water Supply Systems*, *Installing Sanitary Appliances*, *Installing Sanitary Pipework Systems*, *Installing Domestic Gas Supply Systems* and *Performing Sheet Metal Works*. The pass rate for this question was (98.28%), showing that students had a strong understanding of basic concepts across the tested competences.

Good performance was also observed in the remaining competences as follows: *Perform Bench Works* (80.61%), *Domestic Water Supply Systems* (78.45%), *Installing Domestic Gas Supply Systems* (77.59%) and *Performing Sheet Metal Works* (74.59%).

On the other hand, the analysis in Plumbing and Pipefitting 2 (*Practical*) indicates that the competence of *Installing Sanitary Appliances* and *Installing Sanitary Pipe Work System* was assessed in a single question, achieving a good performance of 100%. This success is likely because the question covered familiar, practical procedures that students had frequently practised in class and workshops, making it easier for students to understand the requirements of the question.

The following are measures to be taken to improve the average performance.

- (a) Teachers should strengthen learners' skills of sheet metal materials, tools and their functions, including cutting, bending and joining techniques.
- (b) Increase guided practical sessions where learners practice accurate marking out, cutting, folding and forming sheet metal components using correct tools.
- (c) Emphasize workplace safety, correct tool handling and interpretation of drawings, in line with competence-based assessment standards.

4.1.4 Performance in Painting and Signwriting

In the Painting and Signwriting subject, a total of six competences were tested. The competences were *Maintaining Safety of Workshop*, *Occupational Health and Safety at Workplace and Surroundings*, *Performing Mixing and Selection of Paints*, *Clear Finishes and Colour*, *Performing Structure Painting*, *Performing Basic Signwriting*, *Performing Basic Estimating and Costing* and *Performing Plate Spraying*. Among the competences tested, five showed good performance, while one had average performance.

The performance analysis of Painting and Signwriting 1 indicates that the multiple-choice question item from various competences achieved a good performance rate of 100%. The question covered the following competences: *Maintaining Safety of Workshop, Occupational Health and Safety at Workplace and surroundings, Performing Structure Painting, Performing Basic Signwriting, Performing Basic Estimating and Costing* and *Performing Plate Spraying*.

The other competences with good performance include *Performing Plate Spraying (100%)*, *Performing Mixing and Selection of Paints, Clear Finishes and Colours (95.24%)*, *Maintaining Safety of Workshop, Occupational Health and Safety at Workplace and Surroundings (78.57%)*, *Performing Structure Painting (71.43%)* and *Performing Basic Signwriting (71.43%)*. In these competences, the students' proficiency is demonstrated by accurately analysing the examined concepts.

The competence *Performing Basic Estimating and Costing* had an average performance of 42.86 per cent. This average performance was primarily attributed to an inappropriate explanation and insufficient knowledge and skills related to the specified question.

On the other hand, the analysis of Painting and Signwriting 2 (Actual Practical Paper) reveals that the competence of *Performing Structure painting* had a good performance of 100 per cent. Good performance in this competence was attributed to the students' practical skills and competence in applying the correct painting techniques to achieve the required end product.

To improve the performance in competence with average performance, the following measures are recommended:

- (a) Engage students in regular hands-on activities that simulate real life estimating and costing tasks to strengthen their understanding.
- (b) Use guided demonstrations to show the correct procedures for calculating quantities, costs and measurements.
- (c) Encourage students to work in groups to discuss methods and solve estimating problems collaboratively.
- (d) Incorporate charts, tables and sample costing problems to make abstract concepts more tangible.

4.2 Analysis of Students' Responses by Subject

Students who performed well in the assessment answered questions accurately due to the knowledge and skills they possessed regarding the assessed competences. These students also demonstrated proficiency in using the language of instruction and in understanding the subject matter effectively. Furthermore, they were able to apply correct formulas and carry out calculations.

On the other hand, students who scored low marks lacked understanding of the competences tested. Consequently, they were unable to answer questions correctly. These students neither grasp the requirements of the questions nor could use language fluently or apply the correct formulas in solving relevant problems. Sample answers from some students were used as illustrations of both high and low-scoring responses in each subject.

4.2.1 Masonry and Bricklaying

The analysis of data in Masonry and Bricklaying assessment shows that students performed well in all ten (10) questions of the Masonry and Bricklaying 1 (theory) and also performed well in the practical in Masonry and Bricklaying 2. The good performance in these questions was attributed to the students' adequate understanding of the concepts being tested.

4.2.1.1 Masonry and Bricklaying 1 (Theory)

Analysis of students' responses in Masonry and Bricklaying 1 (Theory) shows that the objective question, consisting of multiple choice items drawn from various competence had a high performance of 98.46 per cent. The question asked:

For each of the items (i) - (x), choose the correct answer from among the given alternatives and write its letter in the box provided.

- (i) *Identify a horizontal member that runs between standards and provides support to a scaffold.*

A Transoms

B Braces

C Bridles

D Ledgers

- (ii) You are required to obtain the dimensional details of the foundation trench during the excavation of a building foundation. Which drawings will you need?
- A Services and block plan drawings
 - B Architectural and engineering drawings
 - C Engineering and site plan drawings
 - D Service and engineering drawings
- (iii) A student is performing a clay content test of soil. Which procedure should be followed after adding water to the soil in a glass jar?
- A Let the mixture of soil and water settle on a glass jar
 - B Take a sample of soil and pour into a glass jar
 - C Measure the different level of soil in a glass jar
 - D Shake vigorously the mixture of soil and water
- (iv) What injury is a result of touching electrical wiring or poorly maintained equipment in construction works?
- A Sprains
 - B Burns
 - C Fractures
 - D Cuts
- (v) You need to water the cement sand blocks daily to achieve its desirable strength. What is the minimum number of days you should carry out this activity?
- A 28
 - B 21
 - C 14
 - D 7
- (vi) What is the key benefit of using an optical level in setting out a building?
- A No tripod needed
 - B Reduce errors
 - C No assistant needed
 - D Works in daylight only
- (vii) What is the common ratio of cement to soil in soil cement blocks?
- A 1:9
 - B 1:5
 - C 1:6
 - D 1:12
- (viii) What type of hazard is associated with physical strain and repetitive actions in masonry and bricklaying?
- A Physical hazard
 - B Mechanical hazard
 - C Ergonomic hazard
 - D Electric hazard

(ix) *Identify the suitable per centage range of clay content for brick manufacturing.*

A 5 – 10%

B 15 – 25%

C 20 – 30%

D 25 – 35%

(x) *Suggest the appropriate range of mortar thickness to the students who have been assigned to install floor tiles in a new constructed building.*

A 25 mm to 30 mm

B 25 mm to 35 mm

C 25 mm to 40 mm

D 25 mm to 50 mm

The analysis of students' responses indicates that they had good knowledge of key concepts and practical applications of the item tested. They correctly identified ledgers as the horizontal members providing support in scaffolding in item (i) and knew that architectural and engineering drawings are required to obtain dimensional details of a foundation trench in item (ii).

Furthermore, the students were aware of proper procedures in soil testing, such as vigorously shaking the soil-water mixture to measure clay content accurately in item (iii) and were aware that contact with live electrical wiring typically results in burns in item (iv). Moreover, students recognised the importance of curing cement sand blocks for a minimum of 21 days to achieve the desired strength in item (v) and understood that using an optical level helps reduce errors during building setting out in item (vi).

The students correctly indicated the common cement to soil ratio for soil cement blocks is (1:6) in item (vii) and identified ergonomic hazards as those associated with physical strain and repetitive actions in masonry work in item (viii). They also knew material composition, selecting the ideal clay content for bricks (15–25%) in item (ix) and applied appropriate practices in tiling, recommending a mortar thickness of 25 – 40 mm for floor tiles (x). Overall, their performance reflects proficiency in both theoretical and practical knowledge of masonry and bricklaying works.

Furthermore, the analysis of the data shows that question five (5) had an average performance of 46.15 per cent. The question was drawn

from the competence of performing material tests. The question asked:

An engineer recommended testing of the bearing capacity of the soil before commencing the construction of the foundation of a building.

- (a) Why is it important to do such a test?*
- (b) Briefly explain four methods used to conduct the test.*

The question consisted of two parts (a) and (b). In part (a), the students were required to explain the importance of testing the bearing capacity of soil before commencing the construction of a building foundation. In part (b), the students were required to explain briefly four methods used to conduct the test. The question aimed to assess students' knowledge of soil testing procedures as well as an appropriate method to ensure the safety and stability of building foundations.

Generally, the students' performance was average, with 46.15 per cent who scored above average and the remaining 53.85 per cent performed poorly by scoring below average. Students who scored poorly had an inadequate understanding of both parts of the question. In part (a), many students failed to explain the importance of testing the bearing capacity of soil before construction. Some provided irrelevant answers, while others simply repeated the question or wrote very brief statements such as "*to know the soil condition*" without explaining how the test helps to ensure foundation safety, prevent settlement or structural failure, or determine whether the soil can safely support the building load. This showed a lack of knowledge of the relationship between soil bearing capacity and the stability of a building foundation.

In part (b), the students with weak performance were unable to correctly identify and explain the required methods of testing soil bearing capacity. Some listed or explained incorrect tests that are not related to bearing capacity, while others mixed up the type of soil with the soil test methods. Other students mentioned the names of tests without any explanation of how they are conducted or what they are used for. The poor performance was attributed by inadequate knowledge, lack of practical exposure to soil testing procedures and

insufficient knowledge on the competence of material and soil testing. Extract 1.1 presents a sample of the student's incorrect response.

5. An engineer recommended testing of the bearing capacity of the soil before commencing the construction of the foundation of a building.

(a) Why is it important to do such a test?

It is ~~im~~ important to know the test of bearing capacity of the soil because its safety support ~~its~~ so you have to know the soil which is suitable (good) for construction

(b) Briefly explain four methods used to conduct the test.

(i) Silt test
Is the smallest particles which are rocks and minerals and are not sieve 5mm

(ii) Loam soil t
Is the smallest particle, found in sand

(iii) Soil test
Is the ~~max~~ mixture of sand, and fine aggregates

(iv) gravel for test
Is the mixture of loam, soil and sand soil.

Extract 1.1: A sample of the incorrect responses to Question 5

Extract 1.1 shows a sample of responses from one of the students who, in part (a), wrote a statement without explaining how the test helps to ensure foundation safety. In part (b), a student explained soil type, confusing them with the type of soil tests, which was not the requirement of the question.

4.2.1.2 Masonry and Bricklaying 2 (Actual Practical)

The analysis of the question assessed in the Masonry and Bricklaying 2 (actual practical) shows that students performed well, with a performance of 100 per cent. The question asked:

A customer wants to purchase 1500 handmade standard clay bricks. Make 25 bricks as samples for the customer to inspect, by using the materials, tools and equipment shown in the given tables.

List of Tools and Equipment

<i>S/N</i>	<i>Tools and Equipment</i>	<i>Quantity</i>
1.	Wheel barrow	1 piece
2.	Spade/shovel	1 piece
3.	Brick trowel	1 piece
4.	Bucket	1 piece
5.	Mortar pan	1 piece
6.	Water drum (20 litres)	1 piece
7.	Hoe	1 piece
8.	Sieve	1 piece
9.	One brick standard timber mould	1 piece

List of Materials

<i>S/N</i>	<i>Materials</i>	<i>Quantity</i>
1.	Clay soil	0.5 cubic metres
2.	Water	60 litres

The question consisted of one main task. Students were required to produce twenty-five (25) standard clay bricks as samples from a total order of one thousand five hundred (1500) bricks for a customer, using the materials, tools and equipment provided in the given tables.

The question aimed to assess students' ability to interpret a practical task, by correctly wearing safety gears, correctly selecting and using appropriate materials, tools and equipment and following the correct procedures for producing standard handmade clay bricks.

The students with good performance had a clear understanding of both parts of the assessment, which include Part I: (Direct Performance) and Part II (Product Performance). In Part I, they correctly wore all required personal protective equipment, including overalls, rain or gum boots, rubber gloves and helmets. They also accurately selected suitable clay soil and the correct amount of water, as well as all necessary tools and equipment, such as the shovel or spade, hoe, sieve, mortar pan, bucket, wheelbarrow, masonry trowel, water drum and standard timber brick mould. In addition, students effectively prepared the working and moulding areas and followed

the correct brick-making procedures, including sieving the soil, mixing clay with an accurate quantity of water to obtain a malleable paste, filling and compacting the mould to remove air pockets, levelling the surface, carefully lifting the mould and placing the bricks in shaded areas for air drying.

In Part II, the students produced high-quality bricks that met the required specifications. The bricks had correct dimensions in terms of width, length and thickness, were rectangular in shape with sharp edges and were free from visible cracks, air pockets, or deformities. They also demonstrated correct hardness, smooth surface finishing, even colour and clean edges. The strong performance observed was attributed to good practical exposure and adherence to standard procedures.

The analysis of students' performance in Masonry and Bricklaying 2 practical assessment based on brick making shows that most students performed well in safety, material selection, work preparation and workplace cleanliness, demonstrating proper use of protective gear, organized tools and a clean, leveled workspace.

However, some students underperformed in general work procedures and product finishing, including sieving clay, mixing to the correct consistency, molding without air pockets and achieving correct brick dimensions, smooth surfaces and clean edges. This shows limited practical experience, which affected quality of the finished bricks.

4.2.2 Carpentry and Joinery with Metal Works

The subject of Carpentry and Joinery with Metal Works was designed to equip students with both theoretical knowledge and practical skills necessary for the construction and manufacturing industry. Assessment in this subject was conducted through Paper 1 (Theory), which tested the understanding of principles, concepts and procedures of performing carpentry and metal work. Paper 2 (Practical) was designed to assess the ability of students to apply these concepts in real life tasks. The competences assessed in this subject include *Maintaining Health, Safety and the Environment at the Workplace and Surroundings*, *Performing Timber Processing and Treatment*, *Constructing Simple Furniture*, *Making Frames*, *Constructing Simple Roofs*, *Constructing Temporary Supports* and *Constructing Wooden Door Shutters*

and Window Shutters.

4.2.2.1 Carpentry and Joinery with Metal Works 1 (Theory)

The assessment of Carpentry and Joinery with Metal Works 1 consisted of 10 questions. Analysis of the students' responses shows that Question 1 recorded good performance with pass rates of 88.68 per cent. This question tested students' ability to select correct answers from various competences namely *Maintaining Health, Safety and Environment at Workplace and Surroundings, Performing Timber Processing and Treatment, Constructing Simple Furniture, Making Frames, Constructing Simple Roofs* and *Constructing Temporary Support*. Many students (88.68%) were able to select the correct answer.

The analysis shows that students who performed well in question 1 had adequate knowledge of the tested competences. The Extract 2.1 shows a sample of correct responses given by a student in this question.

1. For each of the items (i) – (x), choose the correct answer from the given alternatives and write its letter in the box provided.		
(i)	How does ventilation in workshop contribute to safe environment?	
	A It provide clean water B It provide good air quality	B
	C It provide working space D It provide non-slippery floor	
(ii)	During finishing of home or office furniture, which procedure is performed before applying any coat of paint?	
	A Filling gaps B Smoothing surface	B
	C Sealing surface D Polishing surface	
(iii)	Identify the best conversion method of cutting a timber in high quality with less defects.	
	A Quarter sawing method B Back sawing method	A
	C Live sawing method D Tangential sawing method	
(iv)	Identify member of the roof structure which is used to add stability and prevent spreading between pairs of rafters.	
	A Wall plate B Ridge board	D
	C Purlin D Collar tie	

(v)	Why carpenters performs sanding process after making a wooden furniture?				
	A To allow timber to dry	B To add beauty to the furniture			C
	C To smoothen the surface	D To prevent against stains			
(vi)	Which type of the roof is suitable for a building having span up to 3m?				
	A Couple roof	B Lean to roof			A
	C Collar tie roof	D Close couple roof			
(vii)	Select a core or central part of the tree which is formed from the trees at earliest growth.				
	A Sap wood	B Heartwood			C
	C Pith	D Rays			
(viii)	What is a tensile unit required to connect opposite sides of the formwork for cast in situ and precast?				
	A Brace	B Batten			D
	C Stud	D Tie			
(ix)	What is the name of horizontal projection of door and window frame that enables fixing of the frame in the wall opening?				
	A Head	B Horn	C Jamb	D Mullion	B
(x)	Identify a component that fits into another component to produce highly, durable and strong joint.				
	A Dowel	B Mortise	C Wedge	D Tenon	A

Extract 2.1: A sample of the correct responses to Question 1

Extract 2.1 is a sample of correct responses by a student who was able to give correct answers related to health and safety, timber processing and treatment, simple furniture construction, frame making, roof construction and temporary support.

Furthermore, average levels of performance were recorded in the competences of *Constructing Simple Furniture* (64.16%) in questions 8 and 10, *Performing Timber Processing and Treatment* (58.49%) in question 3, *Making Frames* (56.60%) in question 9, *Maintaining Health, Safety and Environment at Workplace* (52.83%) in question 4, *Constructing Simple Roofs* (45.28%) in question 2 and 5 and *Constructing Temporary Supports* (43.90%) in question 6 and 7. For example, the question 6 was as follows:

“Briefly explain five common parts of the formwork used in the concrete construction works”.

The analysis shows that students who performed well in question 6 had adequate knowledge of the tested competences. Extract 2.2 shows a sample of correct responses given by a student in this question.

6. Briefly describe five common parts of the column formwork used in the concrete construction works.
- (a) PANELS
⇒ These are flat boards that provide flat surface to the structure.
 - (b) BATTENS
⇒ These are vertical members that provide support to the panels.
 - (c) LEDGERS
⇒ These are horizontal member that holds and connects battens
 - (d) BRACES
⇒ These are inclined support between ledges.
 - (e) PROPS
⇒ These are vertical support that are responsible for carrying load capacity of the concrete in the formwork

Extract 2.2: A sample of the correct responses to Question 6.

Extract 2.2 is a sample of correct responses by a student who adequately explained five common parts of formwork used in concrete construction works, including their uses. The responses indicate that the student had adequate skills and knowledge in the competence of constructing temporary supports and related construction practices.

However, the analysis of students' responses indicates that those who performed poorly in question six had inadequate competence in the tested area. The student showed confusion between column and beam formwork components and provided incomplete and inaccurate descriptions of the parts listed. In some instances, the candidate merely mentioned the components without clearly explaining their functions in concrete construction works. Extract 2.3 shows a sample of responses from a student who did not answer the question correctly.

6. Briefly describe five common parts of the column formwork used in the concrete construction works.

(a) Braces

(b) Stud

(c) Bottom
 They are placed on beam form work to ensure the stability of the building or any in order to have a good way of pouring concrete.

(d) Braces
 These are horizontal projection of structures that support or generate the beam formwork in order to ensure safety.

(e) Stud
 These are vertical structures that is been stand in a beam formwork and been attached by braces and bottom part to ensure stability.

Extract 2.3 A sample of the incorrect responses to Question 6

Extract 2.3 is a sample of incorrect responses from a student who had poor understanding of the common parts of column formwork and could not clearly explain their uses. The student showed confusion in identifying and describing column formwork components, providing inaccurate labels and unclear function explanations, indicating gaps in knowledge and safe formwork practices.

4.2.2.2 Carpentry and Joinery with Metal Works 2 (Actual Practical)

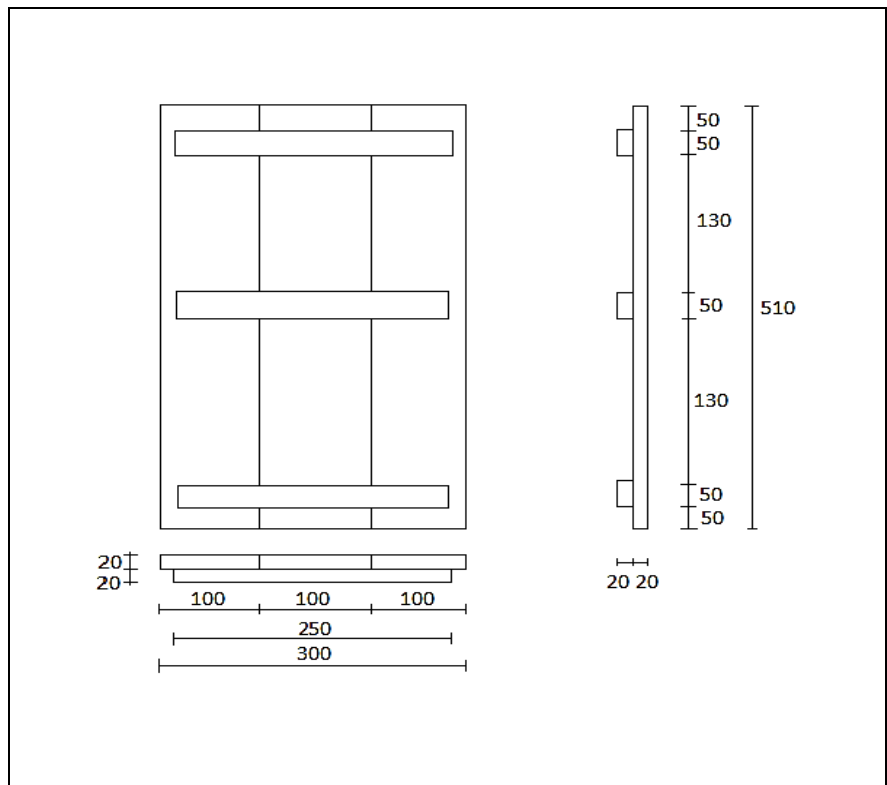
The practical assessment consisted of one question that tested students' competence in constructing Simple Furniture. The analysis shows good performance with a pass rate of 100 performance, meaning that all students had enough skills to meet the requirements of the question. The question was:

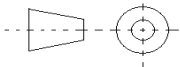
A client visited at your school workshop asking for a meat cutting board. By using 100 mm x 20 mm of wood, construct a ledged and battened meat cutting board for the client to sandpaper finishing stage as shown in Sheet No. 1. Use a scale of 1:1 and all dimensions are in millimetres (mm). Perform the given task by using the following materials and tools:

Materials and Tools Provided

- (i) Hardwood timber of 1550 mm x 105 mm x 25 mm
- (ii) Hardwood timber of 800 mm x 55 mm x 25 mm
- (iii) Common nail $1\frac{1}{2}$ " = 60 pcs,
- (iv) Wooden glue = 0.25 kg,
- (v) Sand paper No. 100, 0.5 m long.
- (vi) Sand paper No. 120, 0.5 m long.
- (vii) Hand saw/Cross cut saw, jack plane, try square, mallet, set of chisels, steel measuring tape, claw hammer, marking gauge, pencil, hand drilling machine and set of bits (size from 2 mm to 5 mm).

Sheet No. 1



PROJECTION 	DIMENSION: mm	REMARKS	
	SCALE: 1:1		
	EXAM TYPE: FTNA		
INSTITUTION: NECTA	TITLE: Constructing Ledged and Battened meat cutting board	SHEET NO. 01	FORMAT: A4

The practical assessment was divided into Part I: Direct Performance (60%) and Part II: Product Performance (40%). Part I checked students' practical skills, safety, material and tool selection, work preparation and following correct procedures. Part II evaluated the finished product, including accuracy, conformity to drawings, smoothness, joint tightness and stability. Marks in Part I focused on how students follow the working procedure, while Part II focused on the quality of the product. Overall, the assessment ensured students demonstrate safe practices, practical skills, accuracy and craftsmanship in Carpentry and Joinery with Metal Works tasks.

The analysis of students' performance in the Carpentry and Joinery with Metal Works 2 (Practical) assessment shows that most students performed well in straightening timber edges, pre-assembling, applying glue and maintaining workplace cleanliness. Most students ensured timber edges were straight and free from gaps, tested joints properly before assembly, applied glue without tearing the wood and cleaned the working area by removing sawdust and other impurities, reflecting careful workmanship, attention to detail and good workshop habits. Additionally, most students returned tools and equipment to the store responsibly, demonstrating adherence to workshop management standards.

On the other hand, some students did not attain the expected competence levels in nailing, assembling work pieces and final product finishing. Few students failed to nail pieces accurately, produced misaligned assemblies therefore they did not achieve the

correct dimensions and diagonals according to the drawings. Weaknesses were also observed in smoothness, minimization of timber defects, joint tightness and product stability, suggesting limited practice in technical procedures, measurement and assembly skills. These gaps affected the overall quality, appearance and structural performance of the finished work.

4.2.3 Plumbing and Pipe Fitting

Plumbing and Pipe Fitting aims at developing students' theoretical understanding and practical competence required in the construction industry. The students were assessed through Paper 1 (Theory), which had ten questions and Paper 2 (Practical) had one question. Analysis of students' responses indicates that the assessment covered competences in *Maintaining Safety of Workshop Surroundings* in question 1, *Performing Bench Works* in questions 1, 4 and 9, *Installing Pipes, Taps and Valves* in question 1, *Domestic Water Supply Systems* in questions 6 and 8, *Installing Domestic Water Supply System* in question 1 and 2 and *Installing Domestic Gas Supply System* in question 1 and 3, *Installing Sanitary Appliances* in question 1 and *Pipework Systems* in question 1 and *Performing Sheet Metal Works* in questions 1, 5, 7 and 10.

4.2.3.1 Plumbing and Pipe Fitting 1 (Theory)

Analysis of students' performance by questions indicates good performance in all ten questions, with question 1 showing the highest level of performance (98.28%). This question required the students to select the correct answer from various competences, which are: *Maintaining Safety of Workshop Surroundings*, *Perform Bench Works*, *Installing Pipes, Taps and Valves*, *Installing Domestic Water Supply Systems*, *Installing Sanitary Appliances*, *Installing Sanitary Pipework Systems*, *Installing Domestic Gas Supply Systems* and *Performing Sheet Metal Works*. The question asked as follows:

For each of the items (i) – (x), choose the correct answer from the given alternatives and write its letter in the box provided.

- (i) Why most of taps and valves are made of brass, bronze and gunmetal?
- | | |
|------------------|--------------------|
| A For durability | B For malleability |
| C For elasticity | D For plasticity |

- (ii) *How is the process of joining sheet metal by using heat and filler material called?*
- | | | | |
|----------|-----------------|----------|----------------|
| <i>A</i> | <i>Bending</i> | <i>B</i> | <i>Welding</i> |
| <i>C</i> | <i>Riveting</i> | <i>D</i> | <i>Marking</i> |
- (iii) *Why is it important to install valves at straight points in gas line?*
- | | |
|----------|---|
| <i>A</i> | <i>To install sections of gas line for maintenance</i> |
| <i>B</i> | <i>To ensure proper ventilation in the area</i> |
| <i>C</i> | <i>To allow the connection of new appliances easily</i> |
| <i>D</i> | <i>To regulate overall pressure of the gas system</i> |
- (iv) *Soil erosion is commonly a problem which faces the farmer during the irrigation process. Identify the correct type of irrigation system to be used to overcome such problem.*
- | | | | |
|----------|--------------------------|----------|--------------------------------|
| <i>A</i> | <i>Furrow irrigation</i> | <i>B</i> | <i>Border Strip Irrigation</i> |
| <i>C</i> | <i>Basin Irrigation</i> | <i>D</i> | <i>Drip Irrigation</i> |
- (v) *Which of the following is among the workshop rules?*
- | | |
|----------|--|
| <i>A</i> | <i>Take any tools without permission from workshop instructor</i> |
| <i>B</i> | <i>Overall should be put away during working hours in a workshop</i> |
| <i>C</i> | <i>Tools or equipment must return to their respective position after use</i> |
| <i>D</i> | <i>The workshop must be cleaned only before use</i> |
- (vi) *Which device is used to distribute water in the form of droplets in a specific area?*
- | | | | |
|----------|---------------------|----------|---------------------|
| <i>A</i> | <i>The mainline</i> | <i>B</i> | <i>Sprinklers</i> |
| <i>C</i> | <i>Water pump</i> | <i>D</i> | <i>The laterals</i> |
- (vii) *Which one is the purpose of introducing tapping in a drilled hole?*
- | | | | |
|----------|---------------------------------|----------|-----------------------------------|
| <i>A</i> | <i>Joining two metal sheets</i> | <i>B</i> | <i>Threading connection</i> |
| <i>C</i> | <i>Filling safety</i> | <i>D</i> | <i>Flattening metal formation</i> |

- The students demonstrated good understanding of workshop safety and discipline by correctly identifying that tools and equipment must be returned to their respective positions after use in item (v). In addition, they correctly identified sprinklers as the device used to distribute water in the form of droplets over a specific area in item

(vi), indicating their understanding of water distribution systems.

The students also showed practical knowledge of metalwork by correctly indicating that tapping in a drilled hole is done to create a threading connection in item (vii). Knowledge of sanitation systems was evident as they correctly identified a septic tank as the sealed underground container where wastewater flows and lighter material floats in item (viii).

However, in item (ix), the majority of students selected cleaning the seat washer as the solution to a flushing cistern valve that does not shut off due to high water pressure, which is an incorrect response. This indicates a weakness in skills related to water pressure control in flushing mechanisms.

Finally, the students showed their knowledge of water supply systems by correctly identifying increased water efficiency as an advantage of indirect water supply in item (x).

Furthermore, the analysis shows that the competence of *Performing Sheet Metal Works* recorded the lowest performance (74.57%) compared to other competences as tested in questions 2, 5, 7 and 10. Question 2 was asked as follows:

Match the uses of sheet metal working tools described in List A with their corresponding names in List B by writing a letter of the correct response below the item number in the box provide.

List A	List B
(i) It is used for cutting light gauge metal material.	A Mallet B Bending plier C Stake D Hammer E Hand shear F Folding bar G Seaming tool H Threading tool
(ii) It is used to turn edges of sheet metal more than 90°.	
(iii) It is used to hit sheet metal for flatter and bending.	
(iv) It is used for fixing wired and folded seams in position.	
(v) It is used for bending sheet metal at 90°.	

The analysis shows the pass rate for question 2 is 74.57 per cent,

justifying that some students had a poor understanding of sheet metal working tools and their specific uses. Example of responses from a student who incorrectly answered the question is as follows: In item (i), the student opted A, *a mallet* instead of E, *hand shears*, showing confusion between striking and cutting tools. For item (ii), the student opted E, *Hand shears* instead of F, *Folding bar*, indicating confusion regarding tools for turning sheet metal edges. In item (iii), the student picked B, *bending pliers* instead of A, *Mallet*, reflecting weak practical knowledge of tools for flattening and bending. Similarly, in item (iv), the student opted A, *Mallet* instead of G, *Seaming tool* shows poor familiarity with fixing folded and wired seams, while in item (v), the student opted G, *Seaming tool* instead of B, *Bending pliers* showing confusion between Seam fixing and bending operations. These responses suggest insufficient hands-on experience and weak links between theory and practice on tool identification and proper usage

4.2.3.2 Plumbing and Pipe Fitting 2 (Actual Practical)

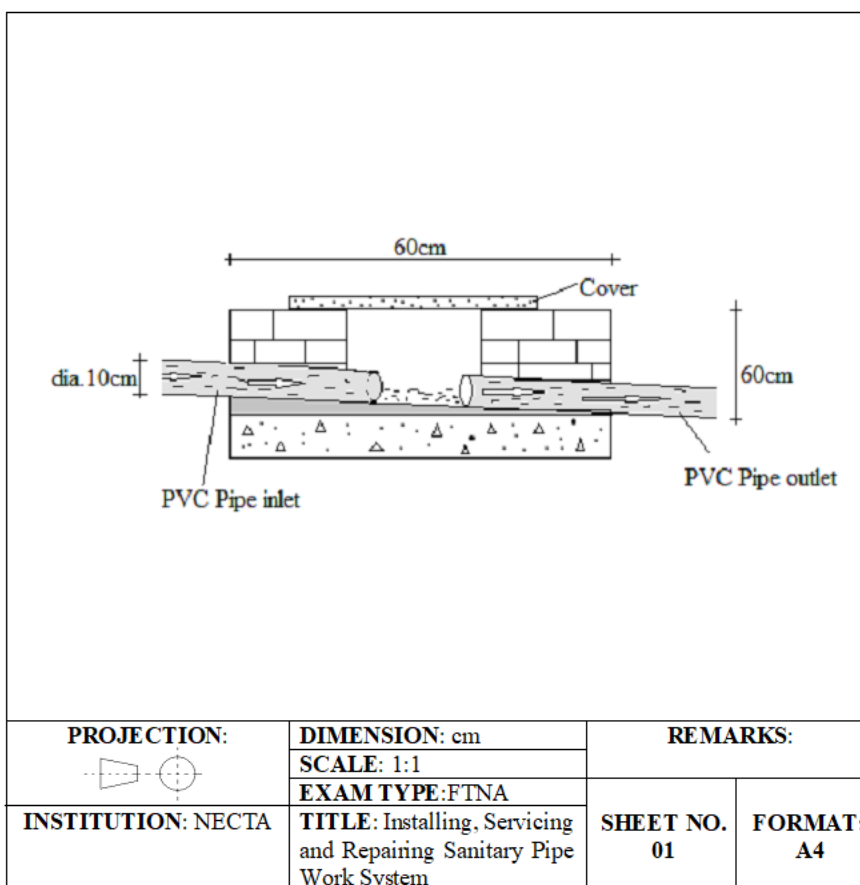
The practical paper consisted of one question assessing the competences of *Installing Sanitary Appliances* and *Installing Sanitary Pipework Systems*. The analysis indicates that students achieved a 100% pass rate, demonstrating that they were able to correctly interpret the task given in the assessment. The question tested in this paper was as follows:

“A new building is constructed 700 cm away from the old one in the same line. You are assigned to connect waste water from new building to septic tank constructed between the new and the old building.

- (a) Sketch the layout showing old and new building with septic tank located at the centre between the buildings. The old and new building constructed on the same built area of 640,000 cm² each and septic tank occupied of 60,000 cm². Use a scale of 1:100 and the layout should be drawn in A4 separate sheet.*
- (b) Construct an inspection chamber to connect waste water from new building showing inlet and outlet parts. Use drawing in Sheet No. 1 for more details.*

Perform the given task by using the following materials and tools;

- (i) 25 kg of Portland cement
- (ii) Cement block of 5"
- (iii) PVC pipe class B in diameter of 10 cm (4")
- (iv) Fine aggregate
- (v) Steel measuring tape, spirit level, shovel spade, pick axe,
- (vi) motor pan, wood flat, steel trowel, try square, plumb bob, hammer, wheel barrow, set of safety kit."



The analysis shows that students with good performance understood the practical task clearly. They correctly wore all required personal protective equipment, including overalls, gloves, gumboots and helmets. They accurately selected and collected materials such as Portland cement, fine aggregate, 5" cement blocks and PVC class B pipes.

Students with good performance effectively used tools, including measuring tape, spirit level, shovel, mortar pan, trowel, plumb bob, hammer and wheelbarrow. They prepared the working area and sketched the layout of old and new buildings with the septic tank at the centre using a scale of 1:100. Dimensions were represented correctly, with each building covering 640,000 cm² and the septic tank 60,000 cm². During inspection chamber construction, they mixed cement and sand properly, levelled and aligned blocks, compacted joints and positioned inlet and outlet pipes correctly. PVC pipes were laid with the correct gradient to ensure smooth wastewater flow. They interpreted drawings accurately and applied measurements correctly. Their work was free from defects such as cracks or misalignment. They maintained cleanliness and order in the working area and showed attention to detail in finishing blocks and joints. The overall quality of work reflected good planning, execution and adherence to standard procedures. Students with good performance demonstrated competence in practical skills and produced a functional, high-quality plumbing installation.

The evaluation of students' competencies in Plumbing and Pipe Fitting was based on two performance components: Direct Performance (60%) and Product Performance (40%), which together constituted the overall assessment score. Direct Performance evaluated students' skills in sketching layouts, observing safety procedures, selecting and handling tools, performing measurements and setting out, levelling inspection chambers and maintaining a clean workspace. Product Performance assessed the accuracy, functioning, quality and finishing of the work, including correct levelling and squaring, proper slope, inlet and outlet installation, internal smoothness, dimension accuracy and overall neatness. The analysis shows that the assessment measured both the application of theoretical knowledge and practical competence, ensuring that students demonstrate the required skills for safe and effective plumbing and pipe fitting tasks.

The analysis of students' performance in the practical assessment of Plumbing and Pipe Fitting shows that most students performed well in tools management, system functionality, final finishing and workplace cleanliness, indicating proper tool selection and handling,

accurate positioning of inlets and outlets, neat workmanship and responsible storage of equipment.

However, some students lacked skills in sketching accuracy, dimensioning, levelling and measurement precision, producing incorrect or incomplete sketches and misaligned structures. These weaknesses suggest limited practice in technical drawing, measurement and setting-out procedures, which affected the overall quality of their work.

4.2.4 Painting and Signwriting

A total of ten (10) questions were assessed in Painting and Signwriting 1 (Theory), while one question was assessed in Painting and Signwriting 2 (Actual Practical).

The students demonstrated good performance in ten questions in the theory paper and in the practical question. However, one (01) question in the theory paper had average performance. Question 8 had the highest level of performance in which all students (100 per cent) attained good performance.

4.2.4.1 Painting and Signwriting 1 (Theory)

Analysis of students' responses in Painting and Signwriting 1 (Theory) shows that question number 8 had a high performance of 91.96 per cent. The question was set on the competence of *Performing Plate Spraying*. The question asked:

A sheet of metal is to be painted using spraying mechanism.

- (a) What are the four tools needed for the task?*
- (b) Briefly explain four steps to be followed when preparing a working area for painting.*

The question aimed to assess students' practical skills in painting using spraying tools as well as their understanding of proper preparation procedures to ensure safety, quality work and efficiency in painting activities.

Generally, the performance in this question was good, as 100 per cent of the students were able to score average marks or above. These students had a clear understanding of both parts of the question. In part (a), they correctly identified four appropriate tools required for

spraying paint, such as a spray gun, strainer, air compressor, paint container and safety gears like masks or goggles. Their responses demonstrated familiarity with workshop practices and correct tool selection.

In part (b), students clearly explained the relevant steps involved in preparing a working area for painting. Their explanations included activities such as cleaning the area to remove dust and dirt, covering nearby surfaces to prevent paint splashes, ensuring proper ventilation and arranging tools and materials systematically. Good performance was attributed to adequate practical exposure and understanding of painting spray procedures. Extract 4.1 provides a sample of a correct response from one of the students.

8.	A sheet of metal is to be painted using spraying mechanism.
(a)	What are the four tools needed for the task?
(i)	Spraygun/Brush.
(ii)	Scraper knife.
(iii)	Wire brush.
(iv)	Sanding block.
(b)	Briefly explain four steps to be followed when preparing a working area for painting
(i)	Inspect the surface.
(ii)	Sand the surface using sanding block with sanding/emery
(iii)	Cover enc the surface and apply primer
(iv)	Clean the surface re after cover and apply a primer coat.

Extract 4.1: A sample of the correct responses to Question 8

Extract 4.1 is a sample of responses by a student who managed to identify the tools needed for painting a sheet of metal using a spraying mechanism in (a) and explained the steps to be followed when

preparing a sheet of metal surface to be painted using a spray mechanism. In part (b), a student clearly explained the steps to be followed when preparing a working area for painting.

On the other hand, the analysis shows that question 10 had an average performance of 42.86 per cent making it the lowest performed question out of ten questions. The question was drawn from the competence of *Performing Basic Estimating and Costing* and it was as follows:

The interior wall of a building is measuring 6 m in length and 3 m in height with an opening of 2.43 m². The paint has a coverage of 10 m² per litre and the cost of paint per litre is Tsh 7,000. Three coats are to be applied during painting. Using the information given calculate:

- (a) *The cost of paint needed to cover the wall.*
- (b) *The cost of primer needed*
- (c) *Profit amount using profit margin of 20%.*
- (d) *The project cost.*

The question aimed to assess students' ability to apply estimating and costing skills, measurement and basic arithmetic in painting works.

The data analysis on this question shows that 57.14 per cent of the students scored below average. Many students with weak performance showed difficulties in interpreting the given data and applying the correct procedures. In parts (a) and (b), some failed to subtract the area of the opening by ignoring the number of coats, or misapplied paint coverage, leading to incorrect calculations. In part (c), a few students were unable to correctly apply the profit margin, while others confused profit with total cost. In part (d), errors from earlier parts were carried forward, resulting in incorrect project costs. The weak performance was attributed to inadequate numeracy skills, inadequate practice in estimating and costing and poor interpretation of the question requirements. Extract 4.2 presents a sample of a incorrect response from one of the students.

10. The interior wall of a building is measuring 6 m in length and 3 m in height with an opening of 2.43 m². The paint has a coverage of 10 m² per litre and the cost of paint per litre is Tsh 7,000. Three coats are to be applied during painting. Using the information given, calculate:

(a) The cost of paint need to cover the wall.

soln

Data given
 Length = 6m
 height = 3m
 opening = 2.43 m²

(Length + width) $\times$ height
 Length 6m + 0m $\times$ 2 + height 3m
 $36 \text{ m}^2 = \text{Area to be painted} = 36 \text{ m}^2 - 2.43 \text{ m}^2 = 33.57 \text{ m}^2$
 $10 \text{ m}^2 = 1 \text{ Litre}$
 $33.57 \text{ m}^2 = x$
 $\frac{33.57 \text{ m}^2}{10 \text{ m}^2} = \frac{x}{10 \text{ m}^2}$
 $x = 3.357 \text{ Litre}$

If 1L = 7000	7000 $\times$ 3.357 = 23349	23349 $\times$ 3 coats = 70047
3.57 $\times$ 7000	23349	

$\therefore$ It will cost 70,047 Tsh

(b) The cost of primer needed.

$\therefore$ The cost of primer = 23349 Tsh

(c) Labour cost if the rate per hour is Tsh 3,000 and is expected to work for 10 hours.

soln

If 1 hr = 3000
 10 hours = x
 $\frac{3000 \times 10 \text{ hrs} = 30000}{30000 \text{ Tsh}}$
 $\therefore$ It will cost 30,000 Tsh

(d) Profit amount using profit margin of 20%.

(e) Total project cost.

Total project cost = cost of paint needed + cost of labour
 Total project cost = 70,047 Tsh + 30,000 Tsh
 Total project cost = 100,047
 $\therefore$ The total project cost needed = 100,047 Tsh

Extract 4.2: A sample of the incorrect responses to Question 10

Extract 4.2 provides an example of a student's response who, in part (a), miscalculated the cost of paint needed to cover the wall, in part (b), (c) (d) and (e) used incorrect data for the calculation leading to incorrect answers.

4.2.4.2 Painting and Signwriting 2 (Actual Practical)

The analysis of performance of the question assessed in the subject of Painting and Signwriting 2 (Practical) shows that the question was performed well. The question asked:

You are provided with a new piece of softwood timber measuring 2000 mm in length, 150 mm in width and 50 mm in thickness. Prepare the surface and apply two coats of clear varnish to protect and decorate the timber. Use the materials and tools provided in the tables.

The analysis of students' performance in the Painting and Signwriting 2 practical assessment on varnishing shows that most students performed well in material selection, tool preparation, workplace cleanliness and tool storage, demonstrating good understanding of materials, proper workshop procedures and responsible work habits.

However, some students underperformed in safety compliance, tool selection, surface preparation and varnish application, with issues such as incomplete use of protective equipment and confusion in selecting appropriate tools and materials. Additionally, improper surface preparation, including inadequate sanding and dust removal, affected the quality of work. Difficulties in applying uniform first and second coats of varnish further resulted in poor finishing.

List of Tools and Equipment

<i>S/N</i>	<i>Tools and Equipment</i>	<i>Quantity</i>
<i>1.</i>	<i>Dusting brush</i>	<i>1 piece</i>
<i>2.</i>	<i>Painting brush 3"</i>	<i>1 piece</i>
<i>3.</i>	<i>Empty tins</i>	<i>1 piece</i>
<i>4.</i>	<i>Scraper knife</i>	<i>1 piece</i>
<i>5.</i>	<i>Paint kettle</i>	<i>1 piece</i>
<i>6.</i>	<i>Sponge</i>	<i>1 piece</i>
<i>7.</i>	<i>Paint strainer</i>	<i>1 piece</i>
<i>8.</i>	<i>Sanding block</i>	<i>1 piece</i>
<i>9.</i>	<i>Personal protective safety equipment</i>	<i>1 set</i>

List of Materials

<i>S/N</i>	<i>Materials</i>	<i>Quantity</i>
1.	<i>Clear varnish</i>	<i>1 litre</i>
2.	<i>Solvent</i>	<i>1 litre</i>
3.	<i>Waste cotton</i>	<i>1 kilogram</i>
4.	<i>Sand paper No. 80</i>	<i>0.2 metre</i>
5.	<i>Sand paper No. 100</i>	<i>0.2 metre</i>
6.	<i>Sand paper No. 120</i>	<i>0.2 metre</i>

Generally, good performance observed was attributed to adequate practical exposure and adherence to standard timber finishing procedures. Overall, the students had good competence in surface preparation and varnishing techniques, producing high-quality timber finishes in line with the task requirements.

The question aimed to assess students' ability to interpret a practical finishing task, correctly wear personal protective safety equipment, appropriately select and use materials, tools and equipment, follow correct surface preparation and varnishing procedures to produce a quality finished timber product.

Students who performed well had sufficient knowledge of both parts of the assessment, namely Part I: Direct Performance and Part II: Product Performance. In Part I, students correctly wore the required personal protective equipment and prepared the work area appropriately. They accurately selected suitable tools and materials, including sandpapers of different grades, sanding blocks, scraper knife, brushes, varnish, solvent and cleaning materials. Students correctly cleaned the timber surface, removed surface defects and sanded progressively using coarse to fine sandpapers to achieve a smooth surface. They also strained the varnish, applied the first coat evenly, allowed adequate drying time, lightly sanded between coats and applied the second coat correctly.

In Part II, the final products of most students met the required specifications. The finished timber surfaces were smooth, clean and free from brush marks, runs or uneven patches. The varnish finish was uniform in colour with a glossy appearance and the edges and corners were well finished. Tools were properly cleaned after use, waste

materials were disposed of correctly and equipment was safely stored.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This report has presented an analysis of statistics on the registration and attendance of students in the Form Two National Assessment (FTNA) 2025 in Civil engineering subjects. It has also presented the overall performance of each subject, the level of performance in various competences and individual questions. Furthermore, factors that contributed to students achieving good or poor performance have been identified.

The analysis shows that the overall performance was 100 per cent. However, there were few challenges identified which hindered the students from achieving high scores.

The National Examinations Council of Tanzania believes that the challenges highlighted in this report will be appropriately addressed so that teachers and students acquire adequate competence, thereby improving performance in future assessments.

5.2 Recommendations

Based on the detailed analysis of the four Civil engineering subjects (Masonry and Bricklaying, Carpentry and Joinery with Metal Works, Plumbing and Pipefitting and Painting and Signwriting) and their practical assessments in the FTNA 2025 report, the following are recommendations to improve students' performance:

- (a) Practicals should continue to be strengthened by increasing hands-on training across all subjects to more improve students' competence in key practical activities.
- (b) The use of demonstrations and visual teaching aids such as diagrams, charts, videos and live demonstrations should be enhanced to more support an understanding of complex procedures.
- (c) Emphasis should be placed on safety and health training, including proper use of Personal Protective Equipment (PPE) and safe handling of tools and equipment during practical work.

- (d) Collaborative learning should be promoted through guided group work and problem-solving activities, particularly in areas that showed average performance.
- (e) The use of standardised templates and checklists should be encouraged to guide students during practical activities and ensure consistency and adherence to quality standards.

Appendix I

A Summary of Students' Performance per Competence in Masonry and Bricklaying

Paper 1 (Theory Paper)

S/N	Competence	Question Number	Per centage of Students who Scored an average of 30% or More	Remarks
1.	Maintaining the Safety of the Workshop and Surroundings, Performing Materials Tests, Making Blocks, Bricks and Paving, Constructing Foundations and Walls, Performing Wall and Floor Finishes.	1	98.46	Good
2.	Maintaining Safety of the Workshop and Surroundings.	7	92.82	Good
3.	Performing Wall and Floor Finishes	3,9	80.26	Good
4.	Constructing Foundations and Walls	4,6	76.16	Good
5.	Making Blocks, Bricks, Pavings	2,10	75.64	Good
6.	Performing Material Tests	5,8	67.94	Good

Paper 2 (Practical Paper)

S/N	Competence	Question Number	Per centage of Students who Scored an average of 30% or More	Remarks
1.	Making Blocks, Bricks, Pavings	1	100	Good

Appendix II

A Summary of Students' Performance per Competence in Carpentry and Joinery with Metal Works

Paper 1 (Theory Paper)

S/N	Competence	Question Number	Per centage of Students who Scored an average of 30% or More	Remarks
1	Maintaining Health, Safety and Environment at Workplace and Surroundings, Performing Timber Processing and Treatment, Constructing Simple Furniture, Making Frames, Constructing Simple Roofs, Constructing Temporary Support	1	88.68	Good
2	Constructing Simple Furniture	8,10	64.16	Average
3	Performing Timber Processing and Treatment	3	58.49	Average
4	Making Frames	9	56.60	Average
5	Maintaining Health, Safety and Environment at Workplace	4	52.83	Average
6	Constructing Simple Roofs	2,5	45.28	Average
7	Constructing Temporary Supports.	6,7	43.90	Average

Paper 2 (Practical Paper)

S/N	Competence	Question Number	Per centage of Students who Scored an average of 30% or More	Remarks
1.	Constructing Simple Furniture	1	100	Good

Appendix III

A Summary of Students' Performance per Competence in Plumbing and Pipe Fitting

Paper 1 (Theory Paper)

S/N	Competence	Question Number	Per centage of Students who Scored an average of 30% or More	Remarks
1	Maintaining Safety of Workshop Surroundings, Perform Bench Works, Installing Pipes, Taps and Valves, Installing Domestic Water Supply Systems, Installing Sanitary Appliances, Installing Sanitary Pipework Systems, Installing Domestic Gas Supply Systems, Performing Sheet Metal Works	1	98.28	Good
1.	Perform Bench Works	4,9	80.61	Good
2.	Domestic Water Supply Systems	6,8	78.45	Good
3.	Installing Domestic Gas Supply Systems	3	77.59	Good
4.	Performing Sheet Metal Works	2,5,7,10	74.57	Good

Paper 2 (Practical Paper)

S/N	Competence	Question Number	Per centage of Students who Scored an average of 30% or More	Remarks
1	Installing Sanitary Appliances & Installing Sanitary Pipe Work System	1	100	Good

Appendix IV

A Summary of Students' Performance per Competence in Painting and Signwriting

Paper 1 (Theory Paper)

S/N	Competence	Question Number	Per centage of Students who Scored an average of 30% or More	Remarks
1.	Maintaining Safety of Workshop, Occupational Health and Safety at Workplace and surroundings, Performing Structure Painting, Performing Basic Signwriting, Performing Basic Estimating and Costing, Performing Plate Spraying	1	100	Good
2.	Performing Plate Spraying	8	100	Good
3.	Performing Mixing and Selection of Paints, Clear Finishes and Colors.	2,4, 9	95.24	Good
4.	Maintaining Safety of Workshop, Occupational Health and Safety at Workplace and Surroundings	3,7	78.57	Good
5.	Performing Structure Painting.	5	71.43	Good
6.	Performing Basic Signwriting	6	71.43	Good
7.	Performing Basic Estimating and Costing	10	42.86	Average

Paper 2 (Practical Paper)

S/N	Competence	Question Number	Per centage of Students who Scored an average of 30% or More	Remarks
1.	Performing structure painting	1	100	Good

