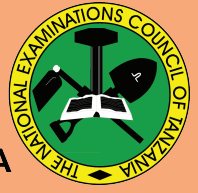




THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA



**STUDENTS' ITEM RESPONSE ANALYSIS REPORT
ON THE FORM TWO NATIONAL ASSESSMENT
(FTNA) 2024**

BULDING CONSTRUCTION



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STUDENTS' ITEM RESPONSE ANALYSIS REPORT
ON THE FORM TWO NATIONAL ASSESSMENT
(FTNA) 2024

071 BUILDING CONSTRUCTION

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FOREWORD

This report presents the Students' Item Response Analysis (SIRA) on the Form Two National Assessment in the subject of Building Construction, conducted in 2024. The report aims to provide feedback to all education stakeholders regarding the factors that influenced students' performance in the Building Construction subject.

The Form Two National Assessment (FTNA) is a formative evaluation designed to monitor students' learning outcomes and provide feedback that teachers, students, and other education stakeholders can use to enhance the teaching and learning process. This analysis justifies the students' performance in the Building Construction subject. Students who achieved high scores demonstrated their ability to understand the demands of the questions, as well as possessing sufficient knowledge, skills, and competence in the subject matter. Students who scored low marks lacked adequate knowledge of the concepts tested and failed to respond according to the requirements of the questions.

The report will help to identify students' strengths and weaknesses, which, in turn, will assist in improving learning before sitting for their Certificate of Secondary Education Examination (CSEE). It will also help teachers to identify challenging areas and take appropriate action during the teaching and learning process.

The National Examinations Council of Tanzania (NECTA) expects that the feedback provided in this report will enable education stakeholders to respond appropriately in improving the teaching and learning of the subject of Building Construction. Consequently, students will be able to acquire the knowledge, skills, and competence outlined in the syllabus, leading to better performance in future.

The Council appreciates the contribution of all those who participated in preparing this report.



Dr. Said A. Mohamed
EXECUTIVE SECRETARY

1.0 INTRODUCTION

This report provides a detailed analysis of students' performance on the Form Two National Assessment (FTNA) 2024 on the subject of Building Construction. The assessment thoroughly covered the Form Two Syllabus for Technical Secondary School Education issued in 2019, as well as the Examination Format issued in 2021.

The Building Construction assessment paper consisted of 10 questions divided into three sections: A, B, and C. Section A included two (2) questions. Question one (1) comprised of ten (10) multiple-choice items each carried one (1) mark, making a total of 10 marks. Question two (2) consisted of five (5) matching items, each carried one (1) mark, making a total of 5 marks.

Section B comprised of seven (7) short answer questions (questions 3 to 9) obtained from various topics. Each of these questions carried 10 marks, making a total of 70 marks for the section. Section C consisted of a single question, which carried 15 marks.

The students who sat for Building Construction assessment in 2024 FTNA were 434 of whom 368 (84.79%) passed while 66 (15.21%) failed. In 2023, students who sat for this subject were 545 out of whom 316 (57.98%) passed while 229 (40.02%) failed. This indicates that students' performance in Building Construction assessment in 2024 has increased by 26.81 percent. The distribution of the scores and students' performance in 2024 is shown in Table 1 and Figure 1.

Table 1: General Students' Performance in Building Construction Subject

Scores Range	Remark	General Performance	
		Number of Students	Percentage (%)
0 – 29	Weak	66	15.21
30 - 64	Average	297	68.43
65 - 100	Good	71	16.36
Total		434	100

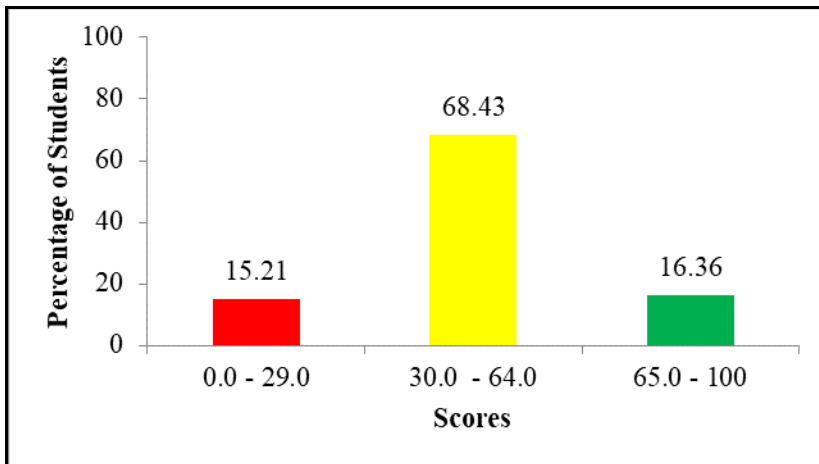


Figure 1: *Distribution of Students' Performance in Percentage*

This report analyses students' responses for each question and their understanding on the questions requirements. In this analysis, a brief note is provided on what the students were required to do and the reasons for their performance. Samples of students' correct and incorrect responses are also inserted in the form of extracts to illustrate the cases presented. Histograms, pie charts and tables are also used to summarize the students' performance in a particular question. The analysis categorizes the performance of the students into three groups namely good, average or weak, manifested by score ranges: 65–100, 30–64 and 0–29, respectively. Green, yellow and red colours have been used to represent the three categories of performance. Finally, the report gives the conclusion and recommendations for improvement.

2.0 THE ANALYSIS OF THE STUDENTS' RESPONSES IN EACH QUESTION

2.1 SECTION A: OBJECTIVE QUESTIONS

This section comprised of two (2) questions. Question 1 had ten multiple-choice items each carrying 1 mark. Therefore, making a total of 10 marks. Question 2 had five matching items, each carrying 1 mark, totalling to 5 marks.

2.1.1 Question 1: Multiple Choice Items

The score intervals used for grading students' performance in this question is shown in Table 2.

Table 2: Score Intervals for Question 1

Scores Range (marks)	General Performance	
	Remark	Grade
0 – 2	Weak	F
3 - 6	Average	C – D
7 - 10	Good	A - B

The question comprised of ten items, (i) – (x) in which each worth one (1) mark. The items were derived from various topics in the Building Construction syllabus, including *Building Construction, Science and Technology, Building Construction Site Analysis, Building Material, Masonry Works, Foundation Wetting Out, Walls and Temporary Support*. Each item had four options (A – D) from which students were required to choose the correct answer and write its letter in the box provided on the question paper.

This question was attempted by 434 students, whereby 11 (2.53%) scored from 0 to 2 mark, 279 (64.29%) scored from 3 to 6 marks, and 144 (33.18%) scored from 7 to 10 marks. further analysis reveals the general performance of students was good since 423 (97.47%) student scored from 3 to 10 marks. Figure 2 shows the performance of the students in question 1.

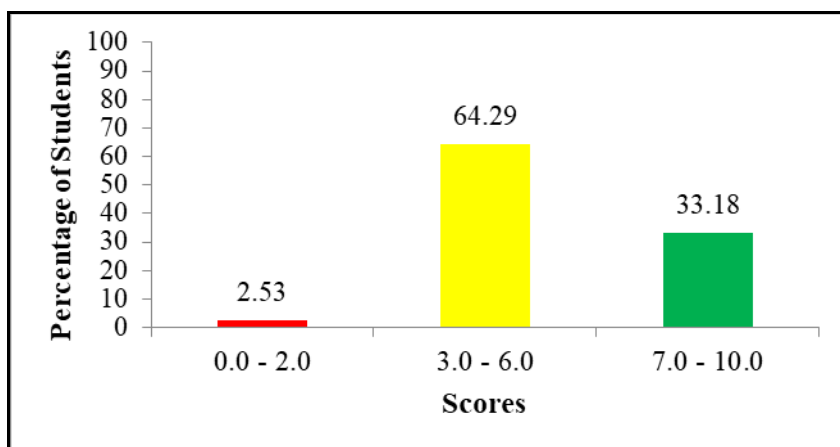


Figure 2: The Students' Performance in Question 1

The strengths and weaknesses of the students in selecting correct answers for specific items in the question are analysed as follows:

Item (i) was developed from the topic *Walls*. The question aimed to measure students' ability to recognize a specific type of brick and its functional role in construction of walls. Students were required to identify the moulded and ornamented brick inserted on a wall to support the joist, truss and weather shed. The question was:

What is the moulded and ornamented brick inserted on a wall to support the joist, truss and weather shed?

- | | | | |
|----------|----------------|----------|---------------|
| <i>A</i> | <i>Cornice</i> | <i>B</i> | <i>Frieze</i> |
| <i>C</i> | <i>Jamb</i> | <i>D</i> | <i>Corbel</i> |

The correct response was *D, Corbel*. Students who selected alternative *D* were aware that a corbel is an element in the wall that support joist, truss, and ornamental treatment. In contrast, students who chose alternative *A, Cornice*, selected the incorrect response. A cornice is a projecting ornamental feature located near the top of a wall or at the junction between the wall and the ceiling, which is used to direct rainwater away from the building.

Students who opted for alternative *B, Freeze*, were also incorrect. A freeze is a horizontal band of stone or other materials placed just below the cornice along the external face of the wall, for decorative purposes and not for structural support. Similarly, students who selected alternative *C, Jamb*, also made an incorrect choice. A jamb refers to the vertical sides of an opening, such as a door, window, or fireplace, and is unrelated with supporting structural elements like joists or trusses.

Item (ii) was set from the topic *Masonry Work*. The question aimed at assessing students' understanding of different types of stones and their properties. Students were required to identify the type of stone that is strongest and most suitable for constructing a workshop building. The question asked:

Suppose you are required to construct workshop building with the strongest stone, which type of stone will you use?

- A Granite B Slates*
C Lime D Marble

The correct response was *A, Granite*. The granite are the types of stone originated from the igneous rock from the cooling and crystallization of the magma beneath the earth's surface. The igneous rock is the strongest rock than other types of rocks. The students who opted for alternatives *B, Slates* and *D, Marble* failed to understand that slates and marble are the stones originated from metamorphic rocks from the pre-existing rocks within the earth's crust under the influence due to temperature, or pressure or both, where these rocks are not strong enough compared to the granite.

Alternative *C, Lime* was incorrect because lime is a product of sedimentary rocks formed by the consolidation of particles of the pre-existing rocks under the effect of weathering agencies such as wind, rain or water. These stones are less strong compared to the granite hence the students who opted for this alternative were not aware of the types of stones, their origination and their characteristics.

Item (iii) was set from the topic *Building construction, science and technology*. The question intended to measure the students' awareness and understanding of the various building elements. Students were required to identify the building element, which forms part of the substructure. The question was:

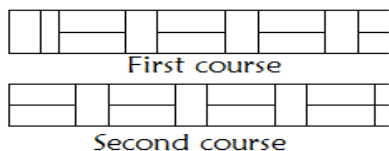
Which of the following building element is part of the substructure?

- A A roof B A door*
C A foundation D A window

The correct response was *C, A foundation*. A foundation is an element of the building that lies below the ground level and is termed as sub structure. In contrast, the rest of the alternatives *A, A roof*, *B, A door* and *D, A window* are the elements of the building above the ground level, collectively known as the superstructure of the building. The students who chose these alternatives were unfamiliar with the concepts of the substructure and superstructure of a building.

Item (iv) was developed from the topic *Masonry Work*. The question intended to test student's awareness in interpreting sketches that depict different types of bonds used in masonry work. Students were required to identify the type of bond used on the bricks arrangement of two courses of a brick wall. The question was:

Study Figure below on the bricks arrangement in the two courses of a brick wall and identify the type of bond used:



- A English* *B Flemish*
C Stretcher *D Header*

The correct alternative was *B, Flemish*, in which this type of bond, each course is comprised of alternate headers and stretchers. The students who opted for this alternative had enough knowledge of interpreting the given sketches of the types of bonds used in masonry work.

Students who opted for alternative *A, English*, failed to understand that English bond consists of alternate courses of headers and stretchers. Likewise, the students who opted for alternative *C, Stretcher*, were unable to understand that stretcher bond is the one in which all the bricks are laid as stretchers on the faces of walls. Furthermore, alternative *D, Header*, was incorrect because a header bond is the one in which all the bricks are laid as headers on the faces of walls.

Item (v) was set from the topic *Temporary Support*. The question intended to assess students' understanding of scaffold components. Students were required to select a member of scaffolds which would be used to support a putlog where there is a window opening in a wall to be constructed. The question stated:

What member of scaffolds will you use to support a putlog where there is window opening in a wall to be constructed?

- A Revel pin* *B Ledger*
C Swivel coupler *D Standard*

The correct response was alternative *A, Revel pin*, a revel pin is a metal or wooden post, which tighten struts, wedged vertically in window openings used to support putlogs. The students, who opted for this alternative, were familiar with various functions of members of scaffolds.

Alternative *B, Ledger* was incorrect response because a ledger is a horizontal pole that connects the standards and they are parallel to the building. Likewise, students who opted for the alternative *C, Swivel coupler* *B*, failed to recognize the correct answer because the swivel coupler are connectors used to clamp the vertical, horizontal and diagonal poles together. Lastly, alternative *D, Standard*, was incorrect response because standards are the vertical poles that carry the weights of the scaffolding to the ground. The students who opted for these alternatives *B, C* and *D* lacked enough knowledge on scaffolds.

Item (vi) was extracted from the topic *Building Materials*. The question intended to assess students' ability to distinguish between building materials that occur naturally and those that are manufactured artificially. Students were required to identify the building material, which is not formed naturally. The question asked:

Which building material is not formed naturally?

- | | | | |
|----------|-------------|----------|-----------------|
| <i>A</i> | <i>Wood</i> | <i>B</i> | <i>Stones</i> |
| <i>C</i> | <i>Clay</i> | <i>D</i> | <i>Plastics</i> |

Students with adequate knowledge on building materials opted for the correct alternative *D, Plastics*. Plastics are manmade or industrially manufactured materials from natural elements, hydrocarbons and forest products. Few students who opted for alternative *A, Wood, B, Stones* and *C, Clay* failed to choose the correct answer because all these materials are found naturally; such students did not demonstrate appropriate knowledge on building materials.

Item (vii) was constructed from the topic *Walls*. The question intended to evaluate students' understanding of plastering techniques, including knowledge of different types of plaster, their characteristics, and appropriate applications. Students were required to choose the type of plaster, which would be recommended for the background of uncoursed rubble masonry wall to be plastered. The question was:

The background of uncoursed rubble masonry wall need to be plastered, what type of plaster would you recommend?

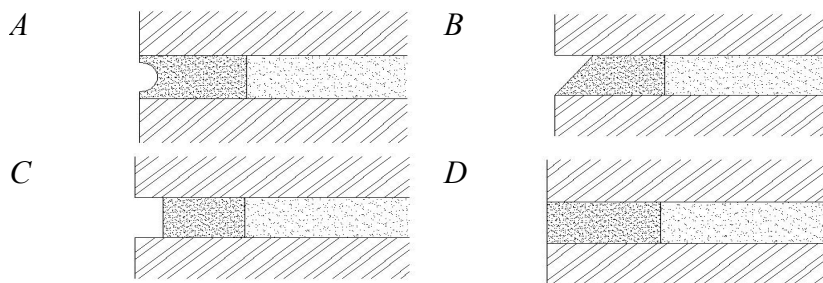
- A Cement plastering B Stucco plastering
C Lime plastering D Barium plastering

The correct answer was A, *Cement plastering*. This is the best mortar for external plastering work since it is non-absorbent and strong compared to other type of plaster. Alternative C, *Lime plastering* was incorrect response because it is absorbent especially for external surfaces in damp climate, it is less strong compared to cement plastering.

Students who opted for alternative B, *Stucco plastering*, were wrong because stucco plastering is a textured finish with ornamental patterns or textured surface made on the final coat used by working with suitable tools. Students who opted for alternative D, *Barium plastering*, were also incorrect because barium plaster is a special type of plastering made from cement, sand and barium sulphate, and it is applied in X-ray rooms to protect the persons working from it.

Item (viii) was extracted from the topic *Walls*. The question aimed to assess students' ability to recognize and identify the visual representation of weathered pointing in a wall finish. Students were required to identify the sketch, which represents weathered pointing of a wall finish. The question was:

Which sketch represents weathered pointing wall finish?



The correct response was B. A weathered pointing is made by making a projection in the form of V-shape. Students who opted for this alternative were familiar with the differences of different types of pointing in walls. Students who opted for the alternative A were unable to choose the correct response because grooved pointing is a modification of flash pointing by

forming a groove at its mid height; by pointing tool and it gives a better appearance.

Moreover, alternative C is the recessed pointing which is the face of the pointing is kept vertical by the suitable tool; the pointing gives very good appearance. Students who selected Alternative D may have confused the plain appearance of flush pointing with the sloping or angular projection of weathered pointing.

Item (ix) was developed from the topic of *Building Construction Site Analysis*. The question intended to assess students' understanding of various machines used for different site activities. Students were required to select type of machines needed for removing top soil and reducing the level on the large site. the question was:

Which machines will you need for removing top soil and reducing the level on the large site?

- A Mechanical auger and pneumatic drill*
- B Backacter and Pneumatic drill*
- C Dump truck and tipper truck*
- D Bulldozer and Mechanical shovels*

The correct alternative was *D, Bulldozer and Mechanical shovels*. Bulldozers are mechanical plant purposely for the removal of the top soil and reducing the level on construction site while the mechanical shovels pick the excavated soil from the ground and throw aside or on hauling trucks for various purposes.

The students who opted for alternatives *A, Mechanical auger and pneumatic drill*, were unable understand that mechanical auger and pneumatic drill are mechanical plants purposely for boring holes on the ground for various construction activities such as the pile foundation. Alternative *B, Backacter and Pneumatic drill*, a backacter is mechanical plant used for carrying the excavate soil and alternative *C, Dump truck and tipper truck*, were incorrect because these mechanical plants are used to transfer the excavated soil from one point to another.

Item (x) was set from the topic *Foundation*. The aim of this question was to assess the students' ability to identify the appropriate temporary support

structure for a foundation trench to prevent the sides from collapsing. It tests their understanding of safety measures in excavation and construction practices. Students were required to select the correct temporary structure that would be used to support the sides of foundation trench from collapsing. the question asked:

*There is a danger of sides of a foundation trench to collapse.
What temporary structure will you use to support it?*

- A Formwork B Timbering
C Shore D Scaffolding*

The correct alternative was *B, Timbering*, which is a process of preventing the soil from the sides of the excavated trench from collapsing. The students, who opted for alternative *A, Formwork*, were wrong because a formwork is a temporary support used to carry the wet concrete until it gains maximum strength. Those students who selected alternative *C, Shore*, were incorrect because shoring is a temporary support used to prevent the walls from collapsing. Furthermore, the students who opted for *D, Scaffolding*, were also wrong because scaffolding is a temporary support used to support the workers and their materials above the ground level.

2.1.2 Question 2: Matching Items

The score intervals used for grading students’ performance in this question shown in Table 3.

Table 3: Score Intervals for Question 2

Scores Range (marks)	General Performance	
	Remark	Grade
0 – 1	Weak	F
2 - 3	Average	C – D
4 - 5	Good	A - B

The question required the students to match items (i - v) described in List A with responses in List B by writing the letter of the corresponding correct response beside the item number. Each item in this question carried 1 mark, making a total of 5 marks. The question was:

Match the definition of brick portions in **List A** with correct terminology in **List B** by writing a letter of the corresponding response under the item number in the table provided.

List A	List B
(i) A portion of brick with the cut made longitudinally.	A. Bevelled bat B. Bat
(ii) A portion of brick, which is obtained by cutting a brick into two, parts lengthwise.	C. Queen closer D. Mitred closer
(iii) A portion of brick obtained by cutting the triangular piece between the centre of one end and the centre of the side.	E. Closer F. King closer
(iv) A portion of brick whose one end is cut splayed for full width.	G. Bevelled closer H. Full brick
(v) A portion of brick obtained by cutting the brick crosswise.	

This question was attempted by 434 students, whereby 204 (47.1%) scored from 0 to 1 mark, 199 (45.85%) scored from 2 to 3 marks, and 31 (7.14%) scored from 4 to 5 marks. These data are summarized in Figure 3.

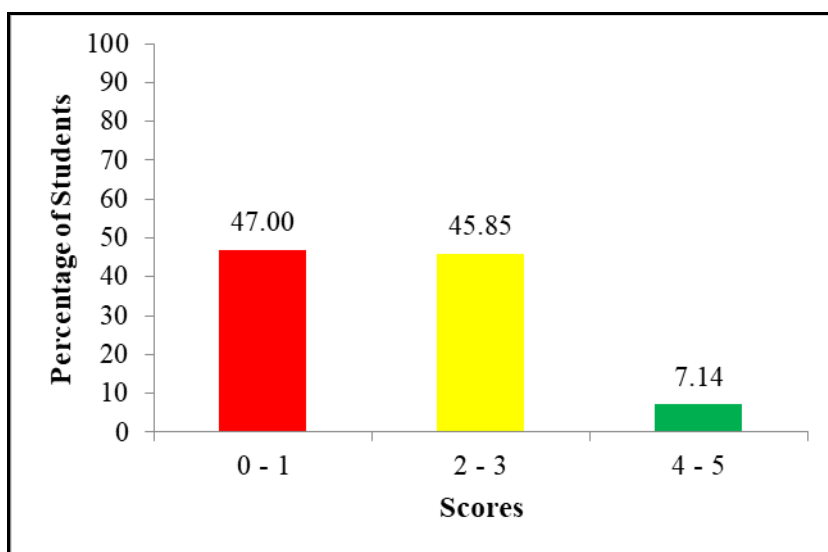


Figure 3: Students' Performance in Question 2

The performance on this question was average because 230 (53%) students

scored from 2 to 5 marks. The students in this group were able to match correctly two items and above. This indicates that students had adequate knowledge on the topic of *Masonry works*. The analysis of the students' performance in each item is as follows:

Item (i): Students were required to match the terminology of a brick portion with the statement *A portion of brick with the cut made longitudinally*. The correct response was *B, Bat*. A bat refers to a portion of a brick cut lengthwise into two or more parts. However, students might confuse this with *E, Closer*, but a closer is a smaller portion of bricks used to close gaps, and it is not cut along the length of the brick.

Item (ii): Students were required to write the correct response that matched the statement *A portion of brick which is obtained by cutting a brick into two parts lengthwise*. The correct response was *C, Queen Closer*. A queen closer is a portion of a brick obtained by cutting the brick lengthwise into two equal parts. This cut allows for the creation of symmetrical brickwork. Students might sometimes confuse this with other longitudinal cuts like a bat, which does not necessarily result in equal halves of the brick.

Item (iii): Students were required to identify a terminology of a brick portion that matched the statement *A portion of brick obtained by cutting the triangular piece between the centre of one end and the centre of the side*. The correct response was *F, king closer*. A king closer is a triangular-shaped piece of brick created by cutting the brick between the centre of one end and the centre of one side. Students might mistakenly select *G, Bevelled Closer*, which refers to a chamfered cut along the brick's edge, but this cut is not triangular in shape.

Item (iv): Students were required to identify the response that matched the statement *A portion of brick whose one end is cut splayed for full width*. The correct match was *D, A Mitred closer* which is a portion of brick with one end cut at an angle (bevelled) to match the full width of the brick. Students may confuse this with *A, Bevelled Bat*, which involves an angled cut across the shorter length of the brick, but it is not splayed for the full width.

Item (v): Students were required to write the correct letter for the terminology matching the statement, *A portion of brick obtained by cutting the brick crosswise*. The correct response was *E, Closer*. A closer is a

portion of a brick cut crosswise, perpendicular to the brick's length. Students confused this with *B. Bat*, which refers to bricks cut along their length.

2.2 SECTION B: SHORT ANSWER QUESTIONS

This section consisted of seven (7) questions from 3 to 9, each carrying 10 marks. This section intended to stimulate the students to remember, give short explanations, understanding and apply the knowledge related to the topic concerned. The score intervals used for grading the performance of students in this section are indicated in Table 4.

Table 4: Score intervals for Questions 3 to 9

Scores Range	General Performance	
	Remark	Grade
0 – 2.5	Weak	F
3 - 6	Average	C – D
6.5 - 10	Good	A - B

2.2.1 Question 3: Workshop Orientation

This question consisted of parts (a), (b) and (c). In part (a), students were required to differentiate hands from power tools while in part (b), the students were required to explain five ways of keeping the tools in good conditions and in part (c) they were required to briefly explain the use of the given block work laying tools; (i) Joint board and (ii) Steel square. The question intended to test students' knowledge of construction tools and their maintenance.

The question was attempted by 434 students, where 49 (11.29%) students scored from 0 to 2.5 marks, 147 (33.87%) students scored from 3 to 6 marks and 238 (54.84%) students scored from 6.5 to 10 marks. These data are summarized in Figure 4.

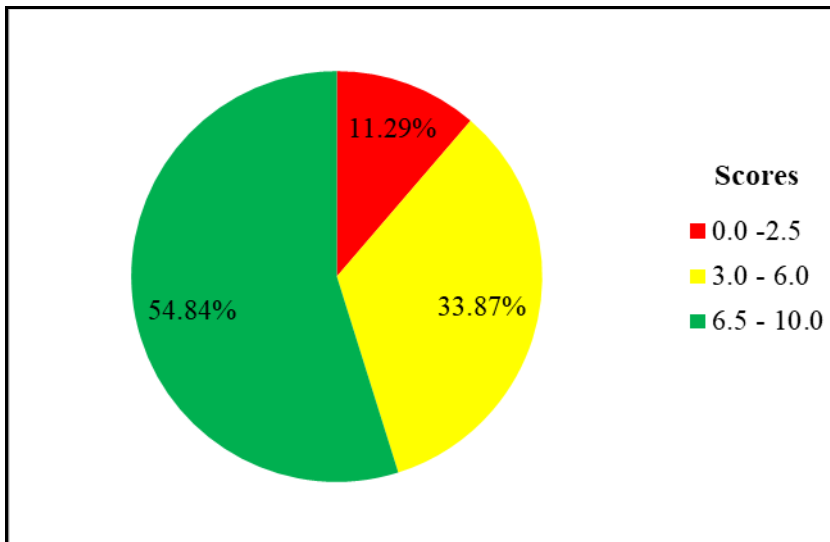


Figure 4: *The Students' Performance in Question 3*

Figure 4 shows that the students' performance in this question was good, with 385 (88.71%) students scoring between 3 and 10 marks. The majority of students with higher marks (6.5 – 10) demonstrated the ability to differentiate between hand tools and power tools in part (a) of the question. In part (b), they successfully explained methods for keeping tools in good condition. These include cleaning tools after use, ensuring safety when using tools, removing loose wristwatches before using machinery, developing safety habits when using tools, avoiding carrying sharp-edged or pointed tools in pockets, and properly connecting power tools.

In part (c), most students from this category were able to demonstrate sufficient knowledge and skills regarding the use of the joint board and steel square. The joint board is used to facilitate the filling of cross-joints, prevent mortar from dropping, and aid in laying mortar on the narrow webs of blocks, preparing for the next course of walling. The steel square is used to check whether the angle formed by two walls is 90 degrees.

The students who scored average marks (3 - 6), in part (a), generally understood the difference between hand tools and power tools. However, their explanations lacked specific examples or clear details. For instance, they mentioned basic distinctions like *hand tools are manually operated* without providing further explanation or examples of each tool type.

In part (b), these students correctly identified some key methods to maintain tools in good condition but failed to list all five ways or provided

detailed reasoning behind each method. For example, they mentioned, *cleaning after use* and *safety precautions*, but lacked further elaboration on why each action is essential. They missed important maintenance tips and had fewer examples than those who scored higher.

In part (c), the average performers demonstrated basic knowledge of the tools' uses. They correctly identified the function of the joint board for example *preventing mortar from dropping* and the steel square for example *checking angles*, but their explanations were brief or lacked details. For instance, some mentioned the steel square helps with angles but failed to mention it is specifically used to ensure the walls meet at a 90-degree angle. Extract 3.1 is a sample of the student's correct responses.

3. Suppose you have been appointed as a school workshop supervisor:

(a) How will you differentiate hands from power tools?

Hand tools refers to the tools that are not powered by electricity. They are tools that require only hand power. Example of hand tools include; Shovel, spade, trowel, lines, and planes. Whereby, Power tools are tools that require external energy such as electricity to be powered. Example of power tools include; angle grinder, circular saw. Thus, power tools and hand tools can be differentiated in terms of their way of functioning, in which one is powered by electricity and another by hand power.

(b) What are the five ways of keeping the tools in good conditions?

- (i) The tools should be kept in their appropriate storage areas.
- (ii) The tools should be cleaned nicely after use of them.
- (iii) The tools should be arranged systematically to avoid damage.
- (iv) The tools should be maintained and handled properly.
- (v) The tools should be regularly checked.

(c) Briefly explain the use of the following block work laying tools.

(i) Joint board

Joint board is a block laying tool that is used to hold mortar in the process of performing jointing.

(ii) Steel square

Steel square is a block laying tool that is used to set out right angles (90°). It is also known as mason's square or builder's square.

Extract 3.1: A sample of the correct responses to Question 3

Extract 3.1 is a sample of the student's responses, who was able to differentiate between hand tools and power tools in part (a). He/she was also able to explain ways of keeping the tools in good condition in part (b) and briefly describe the use of the given blockwork laying tools in part (c).

On the other hand, 49 (11.29%) students who attempted this question scored low marks (0 – 2.5) and some scored zero. These students in part

(a), failed to differentiate between hand tools and power tools. Their responses were incorrect or overly vague, such as confusing hand tools with power tools or failing to mention any clear distinctions. For example, some of the students described all tools as *manual* or used generic terms without explaining the specific characteristics of each category.

In part (b), the majority of these students were unable to provide correct answers regarding the maintenance of tools. They listed only one or two methods, or gave incorrect responses, such as *tools should be used with care* without specifying practical measures example cleaning after use or checking for damage. Their answers lacked depth or demonstrated a misunderstanding of how tools should be cared.

In part (c), poor performers struggled to identify the correct uses of the joint board and steel square. They completely missed the correct functions of these tools or confused their uses with other unrelated tools. For example, they failed to explain that the joint board helps with the even laying of mortar or that the steel square checks the angles of walls. These students might have been unfamiliar with these tools or failed to apply practical knowledge while responding.

Overall, students who scored zero showed a significant lack of understanding and preparedness for the question. Their responses indicated gaps in both theoretical knowledge and practical skills, which may have reflected insufficient study or lack of exposure on the necessary tools and techniques. Extract 3.2 is an illustration of an incorrect responses from a student's script.

3. Suppose you have been appointed as a school workshop supervisor:

(a) How will you differentiate hands from power tools?

.....
 .. Hand tools these are tools which can be carried/moved
 .. from one place to another and they simplify work
 .. while
 .. Power tools these tools which uses power to work

(b) What are the five ways of keeping the tools in good conditions?

(i) It helps them not to be stole.
 (ii) It helps them not to be destroyed.
 (iii) Helps them to be used again.
 (iv) These helps them to stay safely.
 (v) These helps the tools to be re-used again.

Extract 3.2: A sample of incorrect responses to Question 3

Extract 3.2 shows a sample of responses from a student who failed to differentiate between hand tools and power tools in part (a) of the question. In part (b), the student mentioned the advantage of tool storage instead of explaining the proper methods for storing tools.

2.2.2 Question 4: Building Materials

The question consisted of two parts (a) and (b). In part (a), the students were required to outline five forms of commercial glasses available, which are used in construction. In part (b), the students were required to identify the five uses of glasses in buildings. The question aims to assess students' knowledge of the types of commercial glass used in construction and their understanding of the various applications of glass in buildings.

This question was attempted by 434 (100%) students, where 96 (22.12%) students scored from 0 to 2.5 marks. The students who scored from 3 to 6 marks were 202 (46.54%) while 136 (31.34%) of students scored from 6.5 to 10 marks. Figure 5 summarizes the performance of the students in question 4.

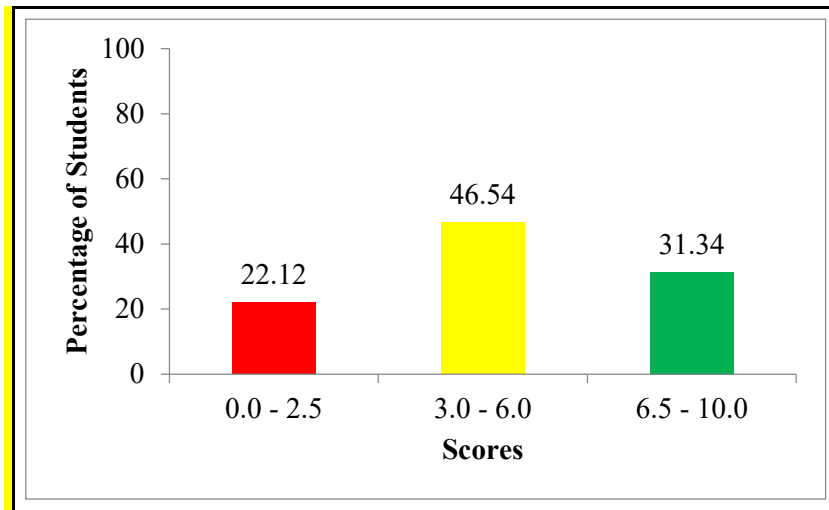


Figure 5: *The Students' Performance in Question 4*

Generally, the students' performance in this question was good as 338 (77.88%) students scored from 3 to 10 marks. Students who scored higher marks (6 – 10) provided comprehensive and accurate responses to both parts of the question. In part (a), they successfully outlined five distinct types of commercially available glass used in construction, such as sheet glass, frosted glass, safety glass, wired glass, and plate glass. Their answers demonstrated a clear understanding of the topic.

In part (b), they identified five practical uses of glass in buildings, including glazing doors, windows, and skylights, constructing partitions, making mirrors, decorating interiors, and insulating pipes. Good performance was attributed to familiarity with the topic, and the ability to distinguish clearly between the forms and uses of glass. These students demonstrated confidence and understanding in their responses.

Students who scored average marks (3 – 6), showed partial understanding on the type and use of commercial glass. In part (a), they were able to list some types of commercially available glass. Their answers included partially correct responses such as *plain glass* without further clarification.

In part (b), they provided some uses of glass in buildings. Their responses were sometimes repetitive or lacked depth, such as listing generalized uses like they are used in construction or used for windows and doors without elaboration. The average performance reflects a moderate level of preparation and understanding. Extract 4.1 provides a sample of correct response from one of the students.

4. Glass is a building material which is commonly used in modern buildings.
- (a) Outline five forms of commercial glasses available which are used in construction.
- (i) Wired glass
 - (ii) Coloured glass
 - (iii) Toughened glass
 - (iv) Opaque Coloured glass
 - (v) heat reflecting glass
- (b) What are the five uses of glasses in buildings?
- (i) In cladding works
 - (ii) In bridging openings such as doors and windows
 - (iii) As insulating material
 - (iv) Glass can be used as a building component example in wall
 - (v) As glass can be used as roofing material

Extract 4.1: A sample of the correct responses to Question 4

Extract 4.1 is a sample of responses by a student who managed to outline the forms of commercial glass available, which are used in construction in part (a), and identified the five uses of glass in buildings in part (b).

Despite a good performance in this question, 96 (22.12%) of the students performed poorly. The majority of the students who scored low marks, in part (a), were unable to outline any correct forms of commercially available glass. Some provided irrelevant answers, such as listing materials unrelated to glass example *wood or metal*, while others wrote incomplete or incorrect responses due to lack of knowledge on commercially available glass for construction.

In part (b), students failed to identify any correct uses of glass in buildings. Many gave irrelevant responses or copied content from unrelated questions in the paper. For instance, some students wrote phrases like *used in building houses* without specifying its practical applications in construction.

Students, who scored zero most of them left the question blank or they either provided completely irrelevant responses, or entirely misinterpreted the question. The poor performance highlights insufficient preparation, lack of basic knowledge of Building Materials, and difficulty in understanding

the question's requirements. Extract 4.2 is a sample of the student's incorrect responses.

4. Glass is a building material which is commonly used in modern buildings.
(a) Outline five forms of commercial glasses available which are used in construction.
(i) Aluminium glasses.
(ii) Plastic glasses.
(iii) Standard glasses.
(iv) Cement glasses.
(v) Iron glasses.
(b) What are the five uses of glasses in buildings?
(i) Use to protect from the dust in the building.
(ii) Use to make the building smart and attractive
(iii) Use to make the building away from theft
(iv) Used to avoid from different geographical weather
(v) Used to avoid from coldness or hotness of a place.

Extract 4.2: A sample of the incorrect responses to Question 4

Extract 4.2 is a sample of the responses from one of the students who provided irrelevant answers in part (a), by listing materials unrelated to glass. In part (b), the student also failed to identify correct uses of glass in buildings, giving inaccurate and impractical uses.

2.2.3 Question 5: Building Materials

In this question, the students were required to differentiate the softwood from hardwood by considering the given factors; annual ring, fire resistance, strength, structure and weight. The aim of the question is to assess the students' ability to differentiate between softwood and hardwood based on key characteristics, demonstrating their understanding of the physical and structural properties of wood and their application in construction.

This question was attempted by 434 (100%) students, where 96 (22.12%) students scored from 0 to 2.5 marks. The students who scored from 3 to 6 marks were 190 (43.78%), while 148 (34.10%) students scored from 6.5 to 10 marks. The distribution of students' scores in this question is summarized in Figure 6.

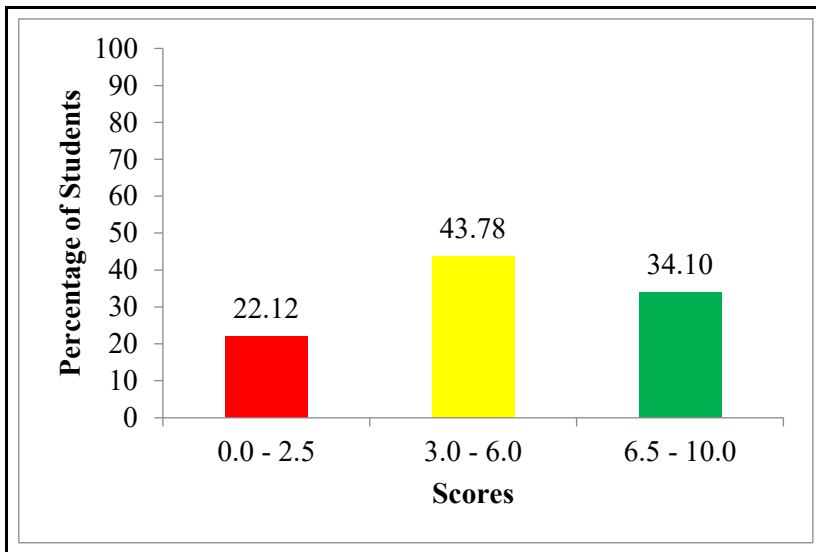


Figure 6: *The Students' Performance in Question 5*

The performance in this question was generally good as 338 (77.88%) students who attempted the question scored between 3 and 10 marks. Students who scored between 6.5 and 10 marks displayed a strong understanding of the topic. They were able to accurately differentiate softwood from hardwood across factors and presented their answers in a clear and structured manner. These students demonstrated sufficient knowledge and skills to classify the qualities and properties of timber correctly.

The students who scored average (3 – 6) marks showed partial understanding of the topic. They were able to identify some differences between softwood and hardwood but struggled to address all factors accurately. For example, they correctly explained one or two differences, such as strength and weight, but failed to provide sufficient detail or clarity on the remaining factors. Their responses indicate moderate knowledge of the topic but an inability to provide comprehensive answers. Extract 5.1 is a sample of the students' correct responses.

5. The qualities and properties of timber depend on the quality of tree from which it is obtained. Differentiate the softwood from hardwood by considering the factor shown in the following table:

Factor	Soft Wood	Hard Wood
Annual ring	It has many annual rings.	It has fewer annual rings.
Fire resistance	It does not resist fire in high level.	It highly resist fire
Strength	Not more strong.	It is more strong.
Structure	It has thin leaves	It has broad leaves
Weight	It has less weight to that of hard wood.	It has high weight.

Extract 5.1: A sample of the correct responses to Question 5

Extract 5.1 is a sample of responses from a student who managed to differentiate between softwood and hardwood across all five factors, as a result, scored full marks.

Among the students who attempted this question 96 (22.12%) had poor performance. The majority of these students showed significant difficulty with the question. They were unable to differentiate correctly between softwood and hardwood. Many provided irrelevant or incorrect responses, interchanging the qualities of softwood and hardwood or copying phrases from unrelated questions on the paper. Others misunderstood the requirements of the question therefore failed to address the factors listed in the table.

The poor performance indicates insufficient knowledge of the topic of Building Materials, particularly the qualities and properties of timber. Some students were unable to recall and apply this knowledge effectively. Extract 5.2 illustrates an example of incorrect responses from a student in this question.

5. The qualities and properties of timber depend on the quality of tree from which it is obtained. Differentiate the softwood from hardwood by considering the factor shown in the following table:

Factor	Soft Wood	Hard Wood
Annual ring	Flim soil	hard firm soil
Fire resistance	Timber	Aggregates
Strength	wood	show has in foundation
Structure	first course	Fremish
Weight	Leadger	clay

Extract 5.2: A sample of the incorrect responses to Question 5

Extract 5.2 shows a sample of responses from a student who copied phrases from unrelated questions on the paper.

2.2.4 Question 6: Foundation

The students were required to explain briefly five dewatering methods, which can be used in waterlogged site. This question intended to test the ability of the student in understanding the methods of dewatering that could be used in water logged site.

A total of 434 (100%) students attempted this question. 165 (38.02%) students scored from 0 to 2.5 marks, 107 (24.65%) students scored from 3 to 6 marks and 162 (37.33%) students scored from 6.5 to 10 marks. Figure 7 summarizes the students' performance in question 6.

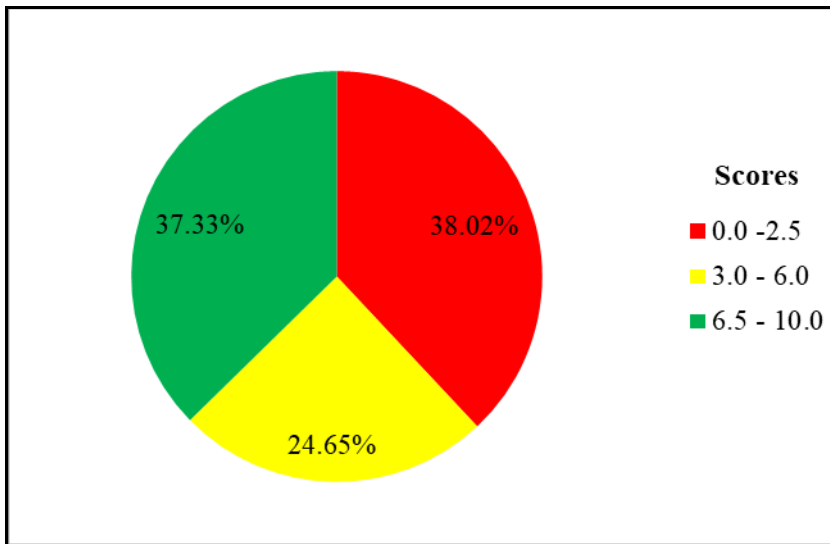


Figure 7: *The Students' Performance in Question 6*

The performance on question 6 was generally average, with 269 (61.98%) students scoring average and above marks, as illustrated in Figure 7. Students who achieved average scores demonstrated a basic understanding of dewatering methods. For instance, they identified pumping as a method but did not elaborate on the different types of pumps or the specifics of their operation in waterlogged sites. Similarly, they mentioned well-point systems, but they failed to explain how these are installed. Their responses reflected partial knowledge on the dewatering methods in water – logged site offering only a basic outline of the methods without sufficient detail, which constrained their performance.

However, the students who scored higher marks (6 -10), demonstrated a strong understanding of dewatering methods. For example, they provided detailed explanations of methods such as pumping, where water is removed using pumps; well-point systems, where water is extracted through ground water pipes wells driven into the ground around the site; and sump pumping, where water is collected using gravity in sumps and channels away from the construction sites. Their success was attributed to their clear comprehension of the question's requirements and their ability to explain effectively the dewatering methods. Extract 6.1 provides a sample of a correct responses.

6. Briefly explain five dewatering methods which can be used in water logged site.
- Dewatering by horizontal method; This is the method of reducing the water table level in a water logged site when building up or excavating of foundation trenches that uses a horizontal sheeting style.
 - Dewatering by well points; Well points are constructed either in dam construction and remove the underlying water in the soil so as to facilitate the foundation trench excavation.
 - Dewatering by construction of deep wells; Another method of dewatering is the construction of deep wells. When deep wells are constructed, the water that is in the soil will also be removed, hence water table level will be reduced to facilitate foundation trench excavation in a water logged site.
 - Dewatering by sump (drain) pumping; This method involves removing water from a water logged site by sump or drain pumping of water. This method also entails to give a comfortable environment for foundation trench excavation.
 - Dewatering by hand (buckets); This method involves dewatering manually. It involves the use of buckets that are used to fetch water manually in the site and pour them far aside. This method entails to provide a suitable environment for foundation trench excavation.

Extract 6.1: A sample of the correct responses to Question 6

Extract 6.1 is a sample of responses by a student who explained briefly dewatering methods, which are used in waterlogged site.

The analysis shows that 165 (38.02%) students scored below the pass mark. These students probably found it difficult to recall or explain dewatering methods. Their responses were unclear. they mentioned pumping without any explanation or listed the methods without providing details. For example, some wrote, *use machines to remove water*, but failed to specify what dewatering techniques involved. This suggests that there is inadequate

understanding or lack of knowledge about dewatering methods.

Students who scored zero provided either irrelevant or incomplete responses. They failed to identify any dewatering methods or offered incorrect information, indicating a lack of understanding of the topic. Extract 6.2 is a sample of incorrect responses.

6. Briefly explain five dewatering methods which can be used in water logged site.

(a) Dewatering by well point.

(b) Dewatering by well points.

(c) Dewatering by horizontal method.

(d) Dewatering by hand (buckets).

(e) Dewatering by digging trenches.

Extract 6.2: A sample of the incorrect responses to Question 6

Extract 6.2 is a sample of the responses from one of the students who was able to list some of the dewatering methods but failed to provide an explanation resulting in poor marks.

2.2.5 Question 7: Walls

The question consisted of two parts (a) and (b). The students were required to; In part (a), identify three tools that would be needed to plaster an external brick wall of a classroom building, and in part (b), briefly explain seven steps that would be followed when plastering the wall. The aim of the question is to assess students' knowledge of the tools needed for plastering an external brick wall and their understanding of the steps involved in the plastering process.

This question was attempted by 434 (100%) students. A total of 95 (21.89%) students scored from 0 to 2.5 marks and 206 (47.47%) students scored from 3 to 6 marks, while 133 (30.64%) students scored from 6.5 to 10 marks. The data is summarized in Figure 8.

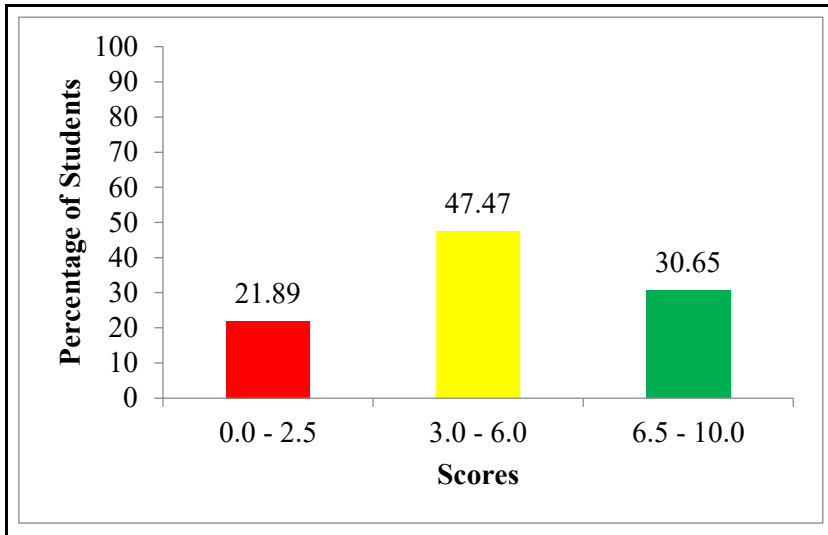


Figure 8: *The Students' Performance in Question 7*

Figure 8 shows that the performance of students in this question was good as 339 (78.11%) students scored pass marks and above. Among them, students who scored higher marks between 6.5 and 10 marks successfully identified the required tools and provided clear, explanations of the steps involved in plastering a wall. Their answers were well structured, demonstrating a deep understanding of the plastering procedures. They demonstrated a high ability in mastering of the topic.

In contrast, 206 (47.77%) students who scored an average (3 – 6) marks were able to identify such tools and explained the steps involved in plastering. However, their responses lacked details or completeness needed for a higher score. Extracts 7.1 depicts the sample of correct responses from a student who correctly answer this question.

7. Suppose you were assigned to plaster an external brick wall of a class room building.

(a) Which tools will you need for the work? Identify three tools.

- (i) Trowel.
- (ii) Float
- (iii) Mortar board.

(b) Briefly explain seven steps you will follow when plastering the wall.

Plastering a wall involves putting of a finish on the wall - It entails for decoration purposes or any other structural properties and purposes. Steps followed when plastering a wall include;

- i. Prepare all tools and equipments that will be used when plastering a wall example a trowel and float.
- ii. Ensure the surface to be plastered is well levelled and is of good condition.
- iii. Clean the surface to be levelled and move any threats available on it.
- iv. ~~Mortar~~ Mix the ingredients that will be used for plastering.
- v. Moisten the surface ready for plastering.
- vi. Apply the plaster on the wall surface.
- vii. Maintain the moisture of the wall (cure) the wall if it is cement-based plaster following the time interval for curing but not less than 7 days, as it will enhance the strength of the plaster applied on the wall surface.

Extract 7.1: A sample of the correct responses to Question 7.

Extract 7.1 is a sample of the correct responses from a student who in part (a), identified three tools that would be needed to plaster an external brick wall of a classroom building, and in part (b), briefly explained seven steps that would be followed when plastering the wall.

Further analysis reveals that 95 (21.88%) of the students scored poorly (0 – 2.5) marks, their responses were incomplete or incorrect, reflecting a lack of understanding of the plastering process and the tools required. For example, in part (a), some students confused tools with materials used for plastering by listing items such as *cement, sand, lime, and aggregate* as tools.

However, in part (b), these students were able to explain the steps of collecting the required tools and materials before starting of the plastering work. Generally, these students demonstrated lack of competence in applying practical knowledge when answering the question. Extract 7.2 below provides sample of incorrect responses from students who attempted this question.

7. Suppose you were assigned to plaster an external brick wall of a class room building.

(a) Which tools will you need for the work? Identify three tools.

(i) Cement

(ii) Water

(iii) Soil (Kham) (Sand) Aggregate

(b) Briefly explain seven steps you will follow when plastering the wall.

1. Prepare
2. Mixed the Cement, Water and Aggregate (sand)
3. Finding the Ratio and to Mixing the Cement, Water and Aggregate
4. Using the Plaster to to ^{Quality Mixing} covering the Uncourse Structure
5. After that Used the Mixing to Measure the Ratio that can be Used in the covering / Plastering.
6. Using the bucket to Skrow the Mummy substance
7. Cover Plastering the Mixing substance at the Uncourse section
8. Curing After plastering Curing the Structure at least One Week or Seven days.

Extract 7.2: A sample of the incorrect responses to Question 7

Extract 7.2 is a sample of responses by a student who incorrectly listed cement, water, and aggregate as tools for plastering in part (a). He/she also incorrectly explained the process of preparing mortar as the process of plastering in part (b).

2.2.6 Question 8: Site Analysis

The question comprised of two parts (a) and (b). The students were required to; in part (a), identify four services that should be provided at the site before commencement of the construction work. In part (b), was to give six reasons for the importance of doing site investigation before

starting construction. This question intended to measure the awareness or understanding of the services that should be provided at site before commencement of the construction process.

This question was attempted by 434 (100%) students whereby 107 (24.65%) students scored from 0 to 2.5 marks; 184 (42.40%) students scored from 3 to 6 marks while 143 (32.95%) students scored from 6.5 to 10 marks. Figure 9 shows the students' performance in question 8.

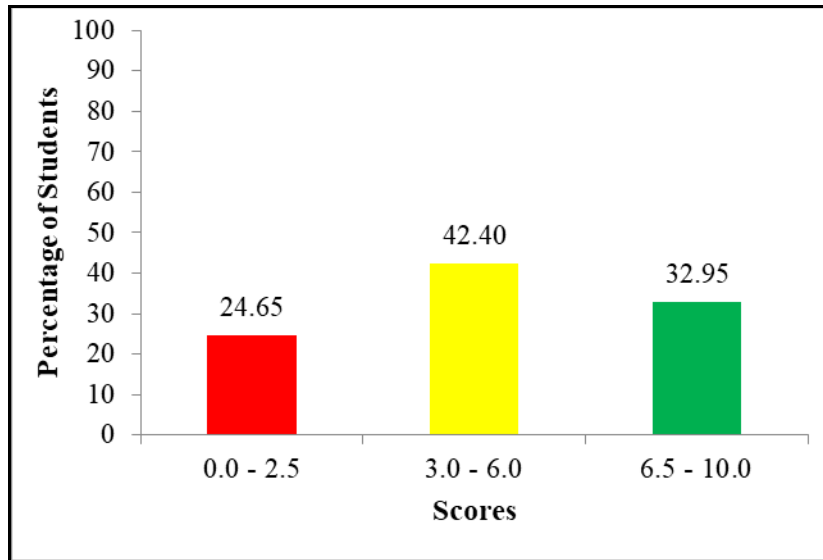


Figure 9: *The Students' Performance in Question 8*

Figure 9 shows the students' performance on this question is good as 328 (75.35%) students scored pass mark and above. The majority of the students who scored higher marks (6.5 – 10), demonstrate a strong understanding of both the services needed before construction and the importance of conducting a site investigation in part (a) of the question. These students were able to identify the necessary services, such as water supply, electricity, and waste disposal, and explained in detail the significance of site investigations, such as identifying potential hazards or assessing ground conditions. Their responses were comprehensive and well explained, showing a thorough grasp of the topics.

The student who scored average (3 – 6) marks were able to identify some services required at a construction site and provided some reasons for site investigation, but their answers lacked or completeness. They mentioned few services or provided brief explanations on why site investigations are important. Their performance indicated a basic understanding, but they

needed more depth or clarity in their responses. Extract 8.1 shows a sample of correct responses, from a student who attempted this question.

8. (a) Which services should be provided at a site before commencement of the construction work?
Identify four services.

(i) Water supply.....
(ii) Electrical supply.....
(iii) Parkings and Toilet.....
(iv) Store and office.....

(b) Why is it important to do site investigation before starting construction? Give six reasons.

(i) To identify the nature of the site, including its history.....
(ii) It helps to know different effects caused by the nature of soil found and what to be taken to prevent.....
(iii) It helps us to understand the type of soil found there and the appropriate foundation suitable for.....
(iv) It helps us to decide on the materials to be used during construction.....
(v) It helps us to know the geographical location weather condition of the site.....
(vi) It helps us to understand the engineering properties of the soil found in the site.....

Extract 8.1: A sample of the correct responses to Question 8

Extract 8.1 is a sample of a student's correct responses. In part (a), the student identified four essential site services and in part (b), the student explained six reasons for site investigations.

Conversely, 107 (24.65%) students performed poorly, scoring from 0 and 2.5 marks. The majority of these students indicated a lack of understanding or recall regarding the required services or the importance of site investigations. Some of these students described the processes undertaken during site preparation in part (a) of the question. For example, they mentioned answers like *demolition of old structures* or *the clearing of bushes and shrubs*.

In part (b) of the question, many students provided general responses rather than addressing the technical importance of site investigations. For instance, some wrote that it helps *to know the need of your site*, while

others of students stated that *it helps to know the cost of the site*. These responses reveal a significant knowledge gap, which may have stemmed from unfamiliarity with the topic. Extract 8.2 provides a sample of incorrect responses from students who attempted this question.

8.	(a)	Which services should be provided at a site before commencement of the construction work? Identify four services.
	(i)	Demolishing of old structures
	(ii)	Clearance of unwanted vegetation
	(iii)	Removal of top layer of the soil
	(iv)	Clearance of unwanted substances
	(b)	Why is it important to do site investigation before starting construction? Give six reasons.
	(i)	It help to understand your site well and know to provide for it
	(ii)	It help to determine properties of your site
	(iii)	Help in designing process of a building
	(iv)	It help to know the type of soil found in the site
	(v)	It help to know the needs of your site
	(vi)	It help to construct building with high weather resistance

Extract 8.2: A sample of the incorrect responses to Question 8

Extract 8.2 is a sample of responses from a student who incorrectly described site preparation processes instead of the required services before construction in part (a). In part (b), the student gave general responses rather than focusing on the technical importance of site investigations.

2.2.7 Question 9: Foundation

Question 9 consisted of two parts namely (a) and (b). The students were required to; in part (a), explain four functions of foundation in buildings, in part (b), with the aid of sketches, distinguish between pad foundation and raft foundation. The aim of this is to assess the students' understanding of foundational concepts in construction.

This question was attempted by 434 (100%) students, whereby 71 (16.36%) students scored from 0 to 2.5 marks, 263 (60.60%) students scored from 3 to 6 marks, while 100 (24.04%) students managed to score from 6.5 to 10 marks. This performance is summarized in Figure 10.

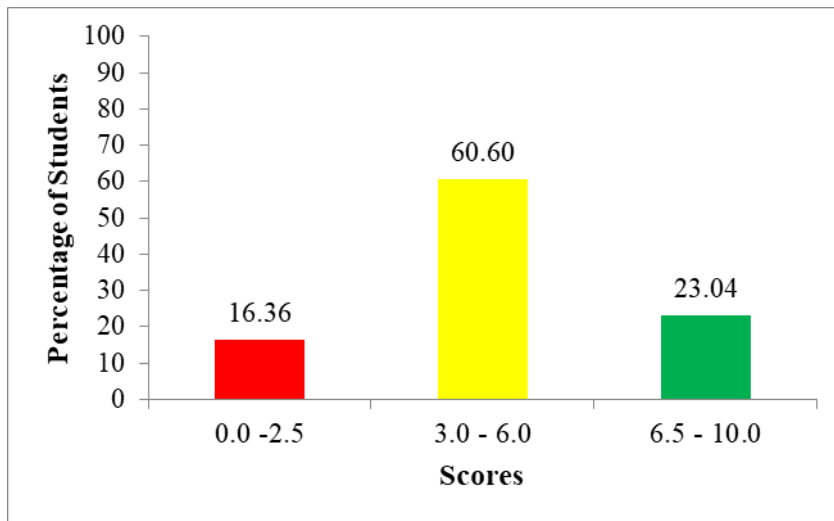


Figure 10: *The Students' Performance in Question 9*

Figure 10 shows that the performance of students on this question was good since 363(83.64%) students scored pass marks and above. The students who scored higher (6.5 – 10) marks demonstrate a strong understanding of both the functions of foundations and the differences between pad and raft foundations. These students were able to explain clearly the functions of foundations, such as supporting the structure, distributing loads, preventing settlement, and providing stability in part (a). In part (b), they used clear, accurate and well-labelled sketches to distinguish effectively between pad and raft foundations, showing a solid grasp of both theoretical concepts and practical applications.

The majority of students, 263 (60.60%), who scored average (3-6) marks demonstrated a basic understanding of the functions of foundations in part (a). in part (b) they were able to provide correct distinctions between pad and raft foundations, but their sketch, lacked clarity, detail, or proper labelling. Extract 9.1 shows a sample of the student's correct responses.

9. (a) What are the four function of foundation in buildings?

- (i) Foundations help to transfer load from the upper part of the building to the underlying firm soil & strata.
- (ii) Foundations prevent unevenly settlement of the building.
- (iii) Foundations help to support the walls and floor of a building structure.
- (iv) Foundation enable the building structure to be stable.

(b) With the aid of sketches, distinguish between pad foundation and raft foundation.

Pad foundation is the type of foundation that supports columns and free standing piers and transfer the loads to the soil. While Raft foundation is the foundation which is constructed at the bottom of the entire building in areas with weak soil.

A sketch of pad foundation

Extract 9.1: A sample of the correct responses to Question 9

Extract 9.1 is a sample of responses from a student who explained the functions of foundations in buildings and in part (b), distinguished with pictorial sketches between pad foundation and raft foundation.

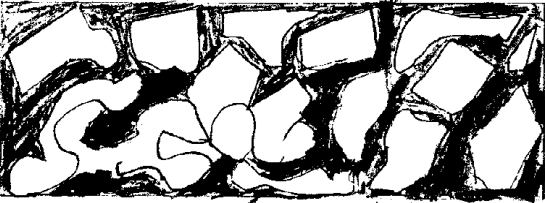
However, 71 students (16.36%) failed to score above the pass marks. The majority of these students were unable to explain all four functions of foundations in part (a) of the question. In part (b), they provided incorrect or inadequate sketches, which were poorly drawn, lacked proper labels or

proportions, and made it difficult to understand the differences between the two foundation types. For example, some students provided an elevation sketch of stone or brick foundation walls, while others drew different types of foundations. This indicates a lack of comprehension in this area. Extract 9.2 is a sample of responses from a student who provided incorrect answers.

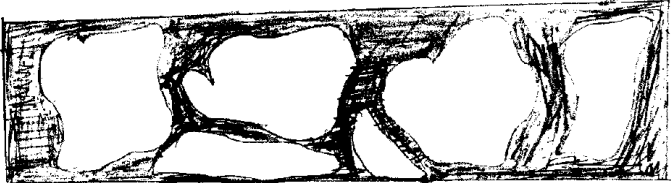
(b) With the aid of sketches, distinguish between pad foundation and raft foundation.

pad foundation it is foundation which arranged to obtain the point ~~are~~ among the stones and therefore the concrete and raft is the foundation which arranged zig zag stones to in line and leveling.

A sketch of pad foundation



A sketch of raft foundation



this is raft foundation.

Extract 9.2: A sample of the incorrect responses to Question 9

Extract 9.2 is a sample of responses by students' in which they incorrectly explained and sketched stone masonry foundation walls instead of differentiating between pad and raft foundations.

2.3 SECTION C: STRUCTURED QUESTION

2.3.1 Question 10: Building Materials

The question comprised of three parts: (a), (b), and (c). Students were required to: (a) identify four properties of aggregates suitable for pouring concrete in a classroom building; (b) list four factors affecting the

workability of fresh concrete; and (c) explain two methods for testing the strength of hardened concrete. The aim of this question was to evaluate their understanding of concrete mix components, factors influencing workability, and methods of strength testing.

This question was attempted by 434 (100%) students, whereby 265 (61%) students scored from 0 to 4.5 marks, 110 (25.35%) students scored from 4.5 to 9.5 marks, while 59 (13.59%) students scored from 10 to 15 marks. This performance is summarized in Figure 11.

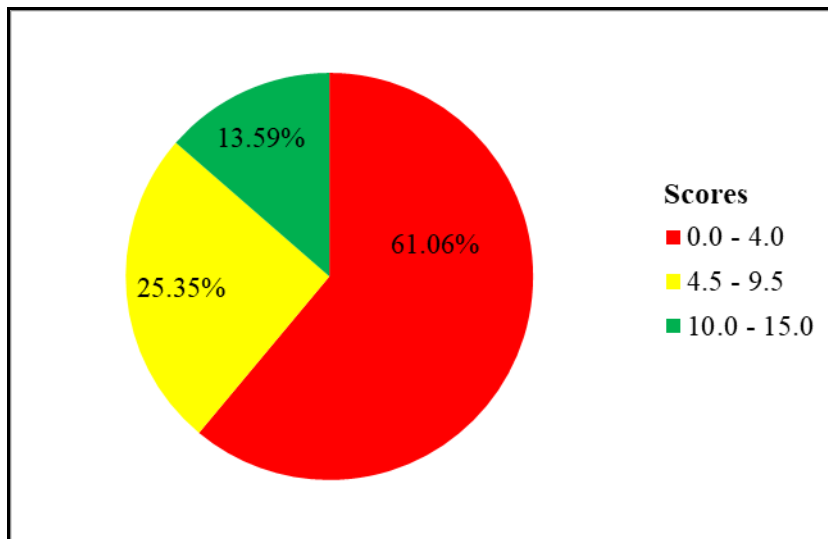


Figure 11: *The Students' Performance on Question 10*

Generally, the performance was average as 39 per cent of the candidates who attempted this question scored average and above marks as depicted in Figure 11. Students who performed average and well in this question demonstrated a comprehensive understanding of all parts of the question. In part (a), they identified key properties of aggregates such as size, shape, texture, and cleanliness and explain how each affects the quality of concrete. In part (b), these students identified and explained factors affecting workability, such as water content, aggregate size, temperature, and admixtures, giving relevant examples of how these factors influence fresh concrete's ease of mixing, placing, and finishing. In part (c), they correctly explained methods for checking the strength of hardened concrete such as the compressive strength test, rebound hammer test and electrical pulse method detailing when and why each method is used. These students had a clear and thorough understanding of concrete-related concepts and could connect them to practical construction processes questions. Extract

10.1 is a sample of the students' correct response.

10. Suppose you are supervising pouring of concrete in a class room building.

(a) What are the four properties of aggregates to be used for the work?

(i) Must be free from impurities

(ii) Must pass to a sieve of 5mm

(iii) Must be stable

(iv) Must have high strength

(b) What are the four factors that may affect the workability of a fresh concrete?

(i) Amount of water; the concrete will not be workable when it has little or a lot of water

(ii) Amount of cement; it should be cement with recommended ratio

(iii) Compaction; that is concrete will a lot of air inside if not workable

(iv) Amount of sand; because for workable concrete it should have recommended ratio of sand.

(c) Briefly explain two methods of checking the strength of hardened concrete.

1/ Rebound hammer testing. Is the method of checking the strength of hardened concrete by leaving the concrete for few days and after few days the hammer is used in hitting the concrete to test for its strength.

2/ Cube crushing. This is the method of checking the strength of hardened concrete, where the cube is dipped into the water for period of either 7, 14 or 28 days. After the 7 days the cube is taken to the laboratory to test / check its strength and the same with 14 days and 28 days. And it is seen that the cube with 28 days is stronger than for 7 or 14 days.

Extract 10.1: A sample of the correct responses to Question 10

Extract 10.1 is a sample response from a student who: in part (a) identified the properties of aggregates suitable for pouring concrete, in part (b) listed the factors affecting the workability of fresh concrete, and in part (c) explained the methods for testing the strength of hardened concrete.

Further analysis shows that 265 (61%) students scored poor (0 – 4) marks. The majority of these students showed significant gaps in their knowledge and understanding. In part (a), these students struggled to identify the correct properties of aggregates. For example, some students only named one word, such as *strength* without specifying the characteristics of strength in relation to the aggregate. Other students provided vague explanations, such as *good for concrete*, without offering further details.

In part (b), they had difficulty in identifying or explaining the factors affecting the workability of fresh concrete. For instance, some students incorrectly mentioned *water* instead of the water-cement ratio, or *aggregate* without specifying the size or shape.

In part (c), these students were unable to explain methods for checking concrete strength, providing responses such as *use a machine* instead of referring to specific tests. Others mentioned tests that are used for assessing other properties of concrete, such as the *slump test*, indicating a lack of understanding of the testing procedures. Extract 10.2 is a sample response from a student who provided incorrect answers.

<p>10. Suppose you are supervising pouring of concrete in a class room building.</p> <p>(a) What are the four properties of aggregates to be used for the work?</p> <p>(i) <i>strength</i></p> <p>(ii) <i>Impermeability</i></p> <p>(iii) <i>Weather resistance</i></p> <p>(iv) <i>Dimensional change</i></p> <p>(c) Briefly explain two methods of checking the strength of harden concrete.</p> <p><i>iv slump test: This method does not test the workability of a concrete</i></p> <p><i>ii Crush test: For determining the work ability of a concrete</i></p>
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Extract 10.2: A sample of the incorrect responses to Question 10

Extract 10.2 is a sample of responses by students who incorrectly used terminologies without specifying the characteristics related to the aggregate in part (a), and mention tests for other concrete properties in part (c).

3.0 ANALYSIS OF THE STUDENTS' PERFORMANCE PER TOPIC

The topics covered in Building Construction subject for FTNA 2024 were *Building construction, workshop orientation, science and technology, building construction site analysis, Building Material, Masonry works, Foundation setting out, Walls and Temporary support.*

The analysis of the students' performance in different topics indicates that students had a good performance in six (6) out of eight (8) topics which were tested in the Building Construction subject. Seven out of eight topics were tested in question one, which consisted of multiple-choice items. About 97.47 percent of all students scored a pass mark and above in question 1.

Other topics that students performed well were *Workshop Orientation* (88.71%), *Walls* (78.11%), *Building Construction Site Analysis* (75.35%) and *Foundation Setting Out* (72.81%). However, students' performance was average in the topic of *Building Materials* (64.90) and *Masonry Works* (52.99) The students' performance per question and per topic is summarized in Appendices A and B, respectively.

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

The analysis of students' performance was done in all the questions that were examined in Building Construction assesment paper in 2024. Generally, the performance of the students was good as 368 (84.79%) students were able to score pass mark and above.

The students' performance in questions 1, 3, 6, 7, 8 and 9 is good while the performance in questions 2, 4, 5 and 10 is average. No question was poorly done.

The average performance of the students was attributed by failure to correctly interpret the requirements of the questions, insufficient knowledge on the tested topic including lack of practical skills specifically on *Building Materials* and *Masonry Works* topic. Poor command of the English language was also a factor for their average performance.

4.2 Recommendations

Based on the performance observed in this analysis, the following recommendations are worth noting by both students and teachers:

- (a) Recommendations to Students
 - (i) Students should be urged to read carefully the instructions before attempting the questions in order to understand the requirement of the questions.
 - (ii) Students are encouraged to search and study appropriate materials from different books or internet sources in order to widen their knowledge. This will help them to grasp relevant and modern concepts and theories applied in the building and construction engineering.
 - (iii) Students should be involved in practical works (activities) whenever they get chance to participate. This will help them to learn by doing.
- (b) Recommendations to Teachers
 - (i) In order to improve the students' performance, teachers should provide sufficient exercises and tests to their students before they sit for the National Assessment. The exercises and tests given should compressively cover the entire syllabus.
 - (ii) Teachers should assist students in developing practical skills to enable them to integrate theoretical knowledge with practical experience, thereby acquiring the expected competencies.
 - (iii) Teachers should help students to develop practical skills to be able to integrate theories with practical experiences, hence acquiring the expected competencies.
 - (iv) Teachers should be provided with enough learning resources that will be able to meet student's practical demands as articulated in textbooks and the syllabuses.

Appendix A

Analysis of the Students' Performance per Question

S/N	Topic	Question Number	Percentage of Students who Scored 30% or More	Remarks
1	Building construction, science and technology, Building site construction, Building material, Masonry works, Foundation setting out, Walls and Temporary support.	1	97.47	Good
2	Workshop Orientation	3	88.71	Good
3	Foundation Setting Out	9	83.64	Good
4	Walls	7	78.11	Good
5	Building Materials	4	77.88	Good
6	Site Analysis	8	75.35	Good
7	Building Materials	5	77.88	Good
8	Foundation Setting Out	6	61.98	Average
9	Masonry Works	2	52.99	Average
10	Building material	10	38.94	Average

Appendix B

The Students' Performance per Topic

S/N	Topic	Question Number	Percentage of Students who Scored 30% or More	Remarks
1	Building construction, science and technology, Building construction site analysis, Building material Masonry works, Foundation setting out, Walls Temporary support.	1	97.47	Good
2	Workshop Orientation	3	88.71	Good
3	Walls	7	78.11	Good
4	Site Analysis	8	75.35	Good
5	Foundation Setting Out	6 & 9	72.81	Good
6	Building Materials	4, 5 & 10	64.90	Average
7	Masonry Works	2	52.99	Average

