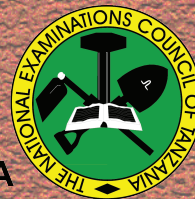




THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA



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

WOODWORK AND PAINTING ENGINEERING



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074 WOODWORK AND PAINTING ENGINEERING

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FOREWORD

This report presents the Students' Items Response Analysis (SIRA) report on Form Two National Assessment in the subject of Woodwork and Painting Engineering which was conducted in November 2024. The report aims to provide feedback to education stakeholders on the factors that contributed to the student's performance in the Woodwork and Painting Engineering subject.

The Form Two National Assessment (FTNA) is a formative evaluation that intends to monitor students' learning outcomes and provide feedback that teachers, students and other education stakeholders can use to improve the teaching and learning process. This analysis shows justification of the student's performance in the Woodwork and Painting Engineering subject. The students who attained high scores demonstrated their ability to understand the demands of the questions as well as enough knowledge, skills and competence in the subject matter. Students who scored low marks lacked adequate knowledge of the concepts tested and failed to respond well according to the demands of the questions.

Furthermore, the report identifies students' strengths and weaknesses, which, in turn, will help to improve learning before sitting for their national assessment. Also, it will help teachers to identify challenging areas and act appropriately during the teaching and learning process.

The National Examinations Council of Tanzania (NECTA) expects that feedback provided in this report will enable education stakeholders to take proper measures to improve the teaching and learning of woodwork and painting engineering subject. Consequently, students will be able to acquire the knowledge, skills, and competence indicated in the syllabus for better performance in future assessments and examinations.

The Council appreciates the contributions 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 the student's performance on Form Two National Assessment (FTNA) 2024 in Woodwork and Painting Engineering subject. The assessment adequately covered the Form Two Syllabus for Technical Secondary School Education issued in 2019 and the Examination Format issued in 2021.

The Woodwork and Painting Engineering assessment paper consisted of 10 questions in three sections namely A, B and C. Section A consisted of multiple-choice and matching item questions. Question one (1) consisted of ten (10) multiple-choice items, and each item weighing one (1) mark, making a total of 10 marks. Question two (2) consisted of five (5) matching items, each weighing one (1) mark, making a total of 5 marks. Multiple-choice items were composed from the following topics: *Workshop Orientation, Safety Rules and Management, Painting Materials, Signwriting and Stencilling, Colour, Oil Paints, Painting Technique, and Varnishes and Finishes*, while matching items were drawn from the topic of *Varnishes and Finishes*.

Section B comprised of seven (7) short answer questions (questions 3 to 9) derived from various topics namely: *Introduction to Painting, Workshop Orientation, Safety Rules and Management, Painting Materials, Colour, Water Paints, and Tie and Dying*. Each of these questions carried 10 marks to make a total of 70 marks. Section C comprised only one question from the topic of *Painting Materials*. This question had 15 marks.

A total of 174 students sat for the assessment whereby 41.95 percent of the students passed with satisfactory, average and good performance. This shows that performance is average. The distribution of scores and students' performance in the Woodwork and Painting Engineering subject is shown in Table 1.

Table 1: General Students' Performance in Woodwork and Painting Engineering Subject

Scores	Remarks	General Students Performance	
		Number	Percentage
0 – 29	Weak	101	58.05
30 – 64	Average	73	41.95
65 – 100	Good	0	0.00
Total		174	100

Among the students who sat for the Woodwork and Painting Engineering assessment in the year 2024, 7 (4.02%) scored grade C while 66 (37.93%) scored grade D, and the remaining 101 (58.05%) students failed by scoring grade F.

The range of the student's performance for each question was determined and an analysis of the strengths and weaknesses of the students' responses was carried out. Extracts of student's good or poor responses are used to illustrate the cases presented. At the end of this report, conclusion and recommendations are made to help education stakeholders to take necessary measures to improve future students' performance.

2.0 THE ANALYSIS OF THE STUDENTS' RESPONSES IN EACH QUESTION

2.1 SECTION A: OBJECTIVE QUESTIONS

This section consisted of two (2) questions. Question one (1) had ten (10) multiple-choice items, each carrying 01 mark to make a total of 10 marks. Question two (2) had five matching items, each carrying 01 mark to make 05 marks. The score ranges used for grading students' performance on each question have been shown.

2.1.1 Question 1: Multiple Choice Items

A total of 174 (100%) students attempted the question, whereby 35 (20.11%) scored from 0 to 2 marks, 134 (77.01%) scored from 3 to 6 marks and 5 (2.88%) scored from 7 to 10 marks. The performance on this question was good since 139 (79.89%) percent of the students who attempted this question scored from 3 to 10 marks. Figure 1 summarizes the performance of the students on this question.

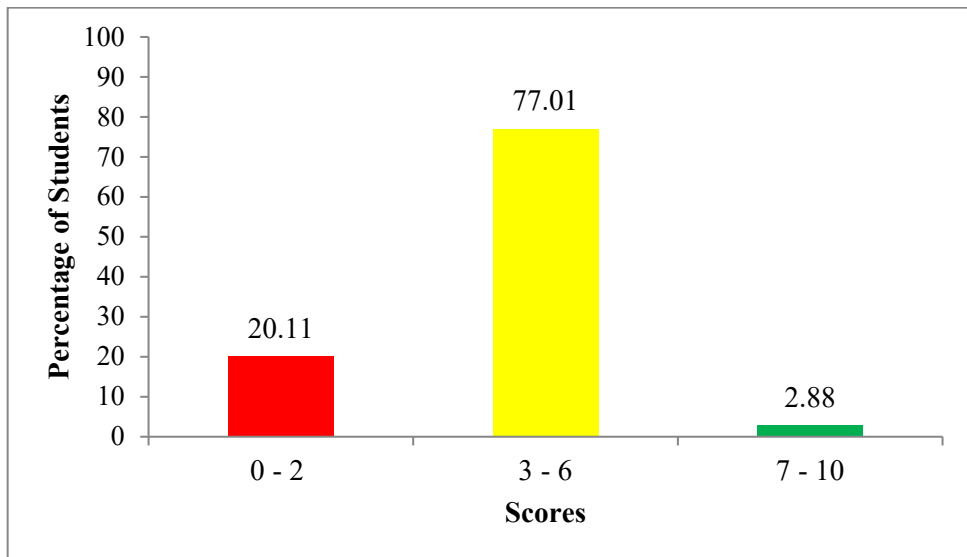


Figure 1: *The Students' Performance in Question 1*

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

Item (i) was set from the topic *Workshop Orientation*. Students were required to select the appropriate machines for cutting external curved shapes in woodwork. The question was:

Select the appropriate machines for cutting external curved shape in woodwork.

- | | | | |
|----------|---------------------|----------|----------------------|
| <i>A</i> | <i>Circular saw</i> | <i>B</i> | <i>Cross cut saw</i> |
| <i>C</i> | <i>Gig saw</i> | <i>D</i> | <i>Band saw</i> |

This question intended to measure knowledge and application of woodworking machine for cutting an external curved shape in woodwork. The correct response for this item was *D, Band saw*. The students who opted for this alternative had enough knowledge of woodworking machines. Alternatively, students who chose alternative *A, Circular saw*, were incorrect because a circular saw is typically used for straight cuts. It uses a round blade that rotates at high speeds, making it difficult to move around curves, especially tight or complicated ones.

The students who opted for alternative *B, A cross-cut saw*, were incorrect because a crosscut saw is a hand saw designed to cut across the grain of the wood. It has a relatively straight blade and is made for cutting along a fixed, straight line. Similar, students who selected alternative *C, Gig saw*, were incorrect because the gig saw is specifically designed for cutting curves and

irregular shapes. It uses a straight blade that moves up and down, allowing for precise, controlled cuts in curved or complicated patterns. The question was:

*Bandages should be applied firmly enough to keep efficient dressing. The following are considered as function of dressing **except***

A ling bleeding

B reducing blood circulation

C g further injury

D absorbing discharge

Item (ii) was developed from the topic of *Safety Rules and Management*. Students were required to identify the incorrect function of a bandage applied firmly enough to keep it efficient. The purpose of this question was to assess the student's knowledge and application of first aid principles, specifically on the functions of a bandage. The correct alternative was *B, Reducing blood circulation*. The students who chose this alternative were aware that reducing blood circulation is not the function of dressing when bandages are to be applied.

Those who opted for the remaining three options, *A; Controlling bleeding*, *C; Avoiding further injury*, and *D; Absorbing discharge* were incorrect because all of these are valid functions of a dressing. Controlling bleeding is one of the primary functions of a dressing when a person sustains a wound, a dressing can help stop or slow bleeding. Avoiding further injury is a dressing that serves as a protective layer that can help prevent further injury to a wound. By covering the wound, the dressing lowers the risk of contamination from dirt, bacteria, or other harmful elements. Absorbing discharge is a dressing that is designed to absorb any discharge blood that comes from a wound, it helps to prevent the wound from becoming too moist, which could lead to infection or delayed healing.

Item (iii) was constructed from the topic *Painting Materials* in which students were asked to recommend the amount of oil needed to paint 300 m² of indoor structure given that 2.0 litres of short oil varnish are estimated to paint 1.5 m² of the same structure. The question intended to assess the students' basic mathematical skills such as multiplication and division, with a specific focus on the ability to apply proportional relationships in a real-life environment. The question was:

If 2.0 litres of short oil varnish estimated to paint 1.5 m² of indoor structure, recommend the amount of oil to be used if the total surface area of indoors structure to be painted is 300 m².

- | | | | |
|----------|-------------------|----------|-------------------|
| <i>A</i> | <i>400 litres</i> | <i>B</i> | <i>150 litres</i> |
| <i>C</i> | <i>250 litres</i> | <i>D</i> | <i>200 litres</i> |

The correct response was *A, 400 litres*. Students who opted for this alternative were correct because if the 2.0 litres varnish covers 1.5 m² surface, then the coverage rate per litre is $\frac{1.5\text{m}^2}{2.0\text{ litres}} = 0.75\text{ m}^2/\text{litre}$. Therefore, the amount of varnish for 300 m² $\frac{300\text{m}^2}{0.75\text{ m}^2/\text{litre}} = 400\text{ litres}$. This shows that they had enough mathematical skills. Alternatives B, C and D were not correct because they represent the amount of varnish that is insufficient to cover the required area of 300 m².

Item (iv) was developed from the topic of *Painting Materials*. Students were required to identify the appropriate painting material that was required to paint government vehicles. The question intended to assess students' knowledge to identify the types of paints regarding their types and applications. The question was:

TAMESA workers are required to paint ten government vehicles. Identify the appropriate painting material that will be used for the required task.

- | | | | |
|----------|------------------------|----------|-------------------------|
| <i>A</i> | <i>Aluminium paint</i> | <i>B</i> | <i>Colloidal paint</i> |
| <i>C</i> | <i>Cellulose paint</i> | <i>D</i> | <i>Bituminous paint</i> |

The correct alternative was *C, Cellulose paint*. Students who opted for this alternative were aware that cellulose paint is a type of automotive paint that is quick-drying and gives a high-gloss finish. It is durable and provides good protection against the elements. Cellulose-based paints are commonly used in vehicle manufacturing and repairs.

Students who opted for alternative *A, Aluminium paint*, were incorrect because aluminium paint is commonly used for surfaces exposed to high temperatures or harsh environments. Similarly, students who selected alternative *B, Colloidal paint*, were incorrect because colloidal paint is used in specialized applications, such as coating items that require a thick, gel-like layer. Furthermore, students who chose alternative *D, Bituminous paint*, were incorrect because this is a type of protective coating used for waterproofing and corrosion in roofs, foundations, and pipes.

Item (v) was set from the topic *Varnishes and Finishes*. Students were required to identify the finishes that could be used to emphasize wood grain and impart colour to the surface of the stock. This question intended to evaluate students' understanding of material properties, their uses, and practical decision-making based on task requirements. The question was:

Identify the finishes that can be used to emphasize wood grain and impart colour into the surface of the stock.

- | | | | |
|----------|--------------------|----------|---------------------|
| <i>A</i> | <i>Wood sealer</i> | <i>B</i> | <i>Wood filler</i> |
| <i>C</i> | <i>Wood stain</i> | <i>D</i> | <i>Wood varnish</i> |

The correct response was alternative *C*, *Wood stain*. Stains allow the natural texture of the wood to show through while changing the wood's colour to the desired shade.

Students who selected alternative *A*, *Wood sealer*, were incorrect because the wood sealer is used to seal the surface of the wood and prepare it for finishing. It helps to prevent moisture absorption, which can lead to swelling or warping. Similarly, those who chose alternative *B*, *Wood filler*, were incorrect because the wood filler is used to fill cracks, holes, or imperfections in the wood surface before finishing. Furthermore, students who opted for alternative *D*, *Wood varnish*, were incorrect because this is a clear finish that provides a protective layer over the wood. It can enhance the appearance of the wood and give it a glossy finish.

Item (vi) was developed from the topic of *Signwriting and Stencilling*. Students were required to identify the type of defect which might be caused when a stencil was used without removing the dirt during stencilling. This question is designed to test students' knowledge of stencilling and surface preparation. The question was:

A sign writer won a tender that required her to apply stencilling. She decided to use the stencil without removing the dirt. What type of defect the sign writer might cause due to her decision?

- | | | | | | | | |
|----------|--------------|----------|----------------------|----------|-----------------|----------|------------------|
| <i>A</i> | <i>Creep</i> | <i>B</i> | <i>Lifting paint</i> | <i>C</i> | <i>Smudging</i> | <i>D</i> | <i>Bittiness</i> |
|----------|--------------|----------|----------------------|----------|-----------------|----------|------------------|

The students with adequate knowledge of signwriting and stencilling opted for the correct alternative *D*, *Bittiness*. These students were aware that bittiness refers to the presence of small particles or imperfections in the paint layer, which is commonly caused by contamination of things dust or dirt, resulting in a rough or uneven finish. If the surface has dirt and the stencil is

applied over it, the dirt particles can mix with the paint and cause a rough or gritty texture.

Students who selected alternative *A*, *Creep*, were wrong because creep is a defect that is caused by the movement of paints beyond the intended edges of the stencil due to improper sealing or stencil shifting. Similarly, those who opted for *B*, *Lifting paint*, were incorrect because lifting paint happens when the paint layer adheres to the surface due to poor surface preparation. All students who opted for alternative *C*, *Smudging*, were wrong because smudging occurs when paint is not given to set before the stencil is removed or when the stencil is not applied cleanly.

Item (vii) was constructed from the topic *Colour*. Students were required to choose the type of warm colour which would be produced when red, orange and yellow colours were mixed. This question assesses the student's knowledge of colour relationships and how specific colours mix to produce different effects. The question was:

Which warm colour will be produced when red, orange and yellow colours are mixed?

- | | | | |
|----------|--------------------------|----------|-----------------------------|
| <i>A</i> | <i>Advance colour</i> | <i>B</i> | <i>Monochromatic colour</i> |
| <i>C</i> | <i>Achromatic colour</i> | <i>D</i> | <i>Discordant colour</i> |

The correct response was alternative *A*, *Advance colour*. because warm colours tend to visually stand out and generate a sensation of closeness or nearness, students who chose the correct option were already familiar with the warm colour.

Students who selected alternative *B*, *Monochromatic colour*, were incorrect as monochromatic colour is produced by using variations of a single colour, achieved by altering its tints, shades, or saturation. Similarly, those who opted for alternative *C*, *Achromatic colour*, were wrong because the achromatic colour is produced by combining black, white, and shades of grey, which lack any hue.

Furthermore, students who opted for alternative *D*, *Discordant colour*, were incorrect because the discordant colour is formed by combining colours that have strong contrasts and do not harmonize well with each other. This can be achieved by using complementary colours or intense hues. Generally, those who failed to provide the correct answer had no or little knowledge of the topic of colour.

Item (viii) was extracted from the topic *Oil Paint*, where students were required to suggest the painting surface in which oil paint can be used with double-boiled linseed oil as a binder which could increase the alkali attack behaviour of oil paint. The question was:

Double boiled linseed oil is a binder which can increase alkali attack behaviour of oil paint. Suggest the painting surface in which oil paint can be used with such a binder.

- | | | | |
|----------|--------------------------------|----------|-------------------------------|
| <i>A</i> | <i>New iron steel surface</i> | <i>B</i> | <i>Plastered surface</i> |
| <i>C</i> | <i>Galvanized iron surface</i> | <i>D</i> | <i>Repainting old surface</i> |

The correct alternative was *B, Plastered surface*. Students who opted for this alternative were correct because a plastered surface is a suitable substrate for oil paints with double-boiled linseed oil as the binder. A plaster, when fully cured, becomes less alkaline and provides a stable base that minimizes the risk of alkali attack on the oil paint.

The students who opted for alternative *A, New iron steel surface*, were incorrect because this is not ideal for painting with oil paint that contains double-boiled linseed oil. Metal is highly prone to oxidation and rusting, which can lead to poor adhesion, peeling, or degradation of the paint. Those who opted for alternative *C, Galvanized iron surface*, were incorrect because a galvanized iron surface is not ideal for painting with oil paints using double-boiled linseed oil as a binder due to the chemical interaction between zinc and oil binder. This can lead to poor adhesion, chalking, peeling, and paint failure. Likewise, students who opted for alternative *D, Repainting old surface*, were wrong because repainting an old surface with oil paint containing double-boiled linseed oil as a binder is not recommended because of the alkali attack behaviour of the paint, which can lead to poor adhesion, cracking, peeling, or chalking of the new paint layer.

Item (ix) was developed from the topic of *Painting Technique*. Students were asked to identify the cause of seeing the undercoat or first coat through the top coat during the application of the painting. This item is intended to assess the students' understanding of painting techniques, and their ability to troubleshoot and identify common painting defects in a practical environment. The question was:

It was reported that during painting the coating was applied but the undercoat or first coat is seen through the top coat. What might be the cause of such surface defect?

- A Painting sections of a surface at different times.*
- B Damaged by rain or condensation.*
- C Draughts, a damp surface or high humidity.*
- D Over-brushing, using thin paint and wrong colour undercoat.*

Those students who opted for alternative *D, Over-brushing, using thin paint and the wrong colour undercoat*, were able to choose the correct response because over-brushing, using thin paint, and applying the wrong colour undercoat can all result in the undercoat being visible through the top coat due to insufficient coverage, opacity, and improper paint application techniques.

Students who opted for alternative *A, Painting sections of a structure at different times*, were incorrect because as long as each section is properly prepared, each layer of paint is sufficiently dry before the next coat is applied, and the correct number of top coat layers are applied, the timing of painting sections does not lead to the undercoat showing through. Those who opted for alternative *B, Damaged by rain or condensation*, were incorrect because this defect typically occurs due to insufficient coverage or thin application of the top coat, rather than moisture exposure. While rain or condensation can cause damage to the paint such as blistering it does not directly affect the opacity of the paint. Students who opted for alternative *C, Draughts, a damp surface or high humidity*, were wrong because this is not the cause of the undercoat being visible through the top coat but can affect the overall quality of the paint finish and cause other defects such as blistering, poor adhesion, or uneven drying.

Item (x) was set from the topic *Varnishes and Finishes*. Students were required to identify the main use of varnish as a resinous solution which forms a hard transparent coating when applied in a thin film. The question was:

Varnish is a resinous solution forming hard transparent coating when applied in a thin film. What is its main use?

- A To enable timber furniture to be attractive to the customer*
- B To smooth timber furniture after being made in workshop*
- C To enable timber furniture dry quickly after being made*
- D To protect and improve the appearance of furniture*

The correct alternative was *D, To protect and improve the appearance of furniture*. Students who opted for this alternative were familiar with the uses of varnishes.

However, students who selected alternatives *A, To enable timber furniture to be attractive to the customer*, *B, To smooth timber furniture after being made in the workshop* and *C, To enable timber furniture to dry quickly after being made*, were incorrect because none of these are correct uses of varnish.

2.1.2 Question 2: Matching Items

This question consisted of five matching items derived from the topic of *Varnishes and Finishes*. The students were required to match description of paint purpose with their corresponding paint term by writing the letter of the correct response below the corresponding item number in the table provided. The question was as follows:

Match the description of painting purpose in **List A** with the corresponding painting term in **List B** by writing a letter of the correct response below the item number in the table provided. The responses from List B may be used more than once.

List A	List B
(i) <i>To protect the material surface.</i>	A. <i>Sanitation</i>
(ii) <i>To make the material surface washable.</i>	B. <i>Decoration</i>
(iii) <i>To provide a pleasing appearance of the material surface.</i>	C. <i>Preservation</i>
(iv) <i>To prevent rusting of the material surface.</i>	D. <i>Levitation</i>
(v) <i>To denote the material surface.</i>	E. <i>Induction</i>
	F. <i>Insulation</i>
	G. <i>Identification</i>
	H. <i>Limitation</i>

A total of 174 (100%) students attempted this question. Out of whom, 29 (16.67 %) scored from 0 to 1 mark, 81 (46.55%) scored from 2 to 3 marks and 64 (36.78%) scored from 4 to 5 marks out of 5 marks allocated. Their overall performance on the question is summarized in Figure 2.

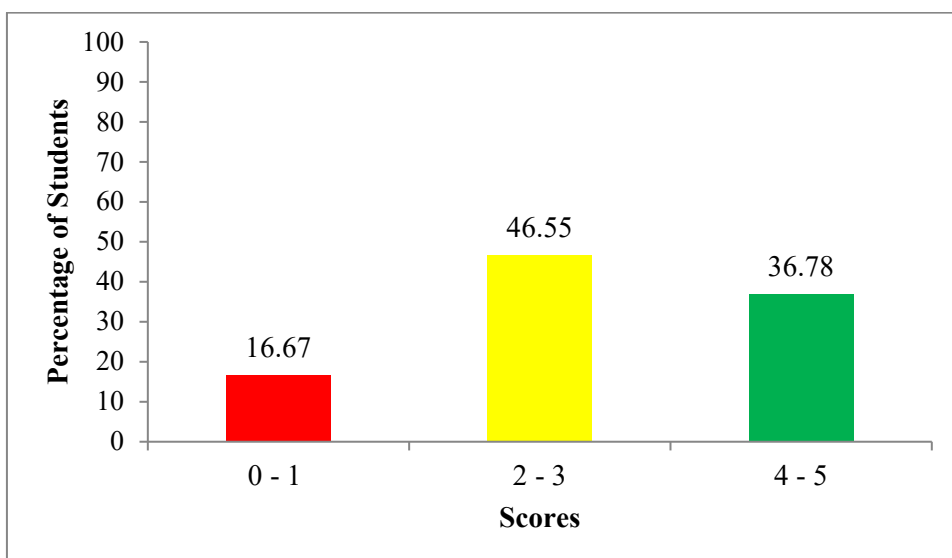


Figure 2: *The Students' Performance in Question 2*

Generally, the student's performance on this question was good since 145 (83.33%) students scored 2 marks and above. This indicates that, students had adequate knowledge of *Varnishes and Finishes* topic. Further analysis of the students' performance in each item is as follows:

Item (i), required the students to identify the term which matches correctly with the statement *To protect the material surface*. The correct response was *C, Preservation*. The majority of students answered this item correctly, indicating their adequate knowledge of the meaning of preservation in woodwork. However, a few students selected option *F, Insulation*, indicating a misunderstanding as insulation refers to the process or material used to protect against heat, cold, sound, or electricity.

In item (ii), the students were required to match the term that means to make the material washable. The correct response was *A, Sanitation*. The students, who responded correctly to this item, understood that making a material washable is related to sanitation, ensuring that it can be cleaned and kept hygienic. This signifies that they had sufficient knowledge of the specific concept asked. However, some of the students chose option *D, Levitation*. Such students failed to differentiate between sanitation and levitation. Levitation does not match any of the purposes of treating material surface from the given list. It is more related to making objects float or levitate.

Item (iii), students were required to provide a suitable response which matches correctly with the statement *To provide a pleasing appearance of*

the material surface. The correct response was *B, Decoration*. Students who matched this item correctly demonstrated a clear understanding that decoration involves improving the look of the surface, which aligns directly with providing a pleasing appearance.

Item (iv) students were required to identify a term that means to prevent rusting of the material surface. The correct response was *C, Preservation*. The analysis of the students' responses indicates that they performed well on this item. However, a few students selected other options, indicating their lack of knowledge of painting materials.

Item (v) requires the students to recognize a term that relates to denote the material surface. The correct answer was *G, Identification*. Some of the students failed in this item by choosing *E, Induction*. Such students failed to differentiate between the identification and the induction. Induction does not seem to align directly with any of the surface treatment functions or purposes outlined in the list. Extract 1.1 shows a sample of students' correct matches in question 2.

Answers

List A	(i)	(ii)	(iii)	(iv)	(v)
List B	C	A	B	C	G

Extract 1.1: A sample of the correct responses to Question 2

In Extract 1.1, the student matched correctly the description of the painting purpose in List A with the corresponding painting term in List B. This shows that the student had sufficient knowledge of the description of the painting's purpose.

On the other hand, 29 (16.67%) students who scored low marks incorrectly matched the description of painting purpose with the corresponding term. This indicates that they lacked adequate knowledge of the description of painting purpose of the surface.

Extract 1.2 shows a sample of incorrect responses given by one of the students in question 2.

Answers

List A	(i)	(ii)	(iii)	(iv)	(v)
List B	D	C	F	G	H

Extract 1.2: A sample of incorrect responses to Question 2

In Extract 1.2, the student incorrectly matched the description of the painting purpose in List A with the corresponding painting terms from List B. This shows that the student had insufficient knowledge about the purpose of painting.

2.2 SECTION B: SHORT ANSWER QUESTIONS

This section consisted of seven (7) questions constructed from the following topics: *Introduction to Painting; Workshop Orientation; Safety Rules and Management; Painting Materials; Colour; Water Paints*, and *Tie and Dying*. Each question carried 10 marks, making a total of 70 marks. The score intervals used for grading the performance of the students for each question in this section are indicated in Table 2.

Table 2: Score Intervals for Questions 3 to 9

Score Range (Marks)	Remarks
0 – 2.5	Weak
3 - 6	Average
6.5 - 10	Good

2.2.1 Question 3: Introduction to Painting

The question had three parts (a), (b) and (c). The question aimed to test the students' knowledge on types of paints. The question stated:

Suppose you are given a site to paint using various types of cement paint:

- (a) What would be the appropriate composition of the paint according to its nature?*
- (b) How could you prepare the cement paint?*
- (c) What will you do to get the quality of a painting work on the cement painted surface?*

The data analysis shows that the question was answered by 174 (100%) students and among them, 149 (85.63%) students scored from 0 to 2.5 marks, and 25 (14.37%) students scored from 3 to 6 marks out of 10 marks allocated. Figure 3 shows the performance of the students in this question.

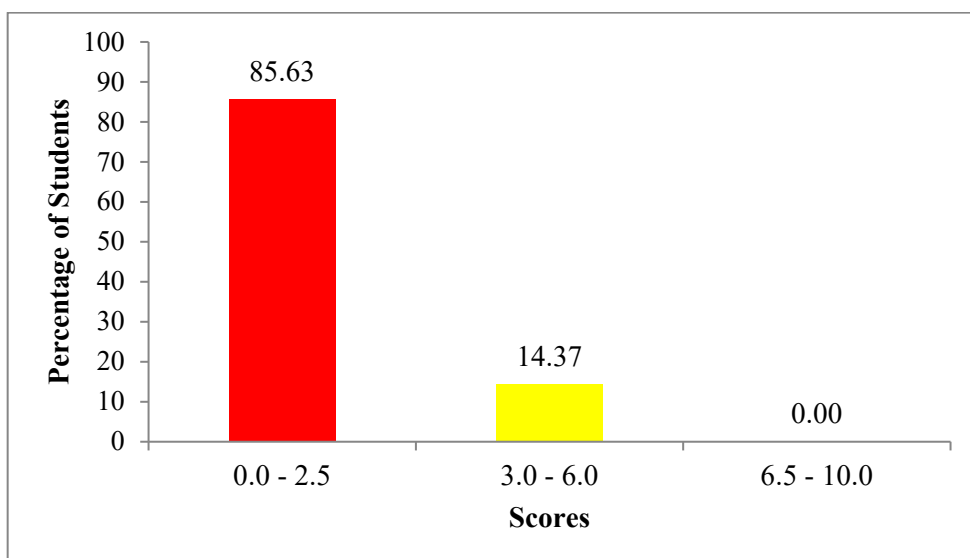


Figure 3: *The Students' Performance in Question 3*

Figure 3 shows that the students' performance in this question was poor, with 25 (14.37%) students scoring from 3 to 10 marks. Further analysis reveals that those who scored low marks faced difficulties in answering all three parts of the question. This difficulty may be attributed to several factors, including a lack of knowledge about painting materials and an inability to fully understand the question requirements.

The students who scored average performance were relatively able to give correct responses in some parts (a), (b) and (c) of the questions. In part (a), the majority of the students failed to identify the types of cement paint that would be the appropriate composition of the paint according to its nature, as they response *colour pigment, binder, solvent* and *additives*. In part (a) the appropriate composition of cement paint according to the nature of particular paint it should be; white cement (60% to 75%), hydrated lime (10 % to 20%), hygroscopic salt (calcium or sodium chloride) (4% to 5%), calcium or aluminium stearate (1%) and white pigment (titanium dioxide or zinc sulphate) (2% to 5%).

In part (b), in order to prepare the paint cement; Cement types should available in powder form which requiring mixing only in proper volume of water before use to form cement paints. The cement powder which mix with proper volume of water is warmly stirring in a suitable container to certain period of time to avoid solid particles which can be deposited at the bottom of container during application. Lastly, to obtained quality painting work on

the cement painted surface ensure before the first coat is applied, the surfaces are wetted to even and control suction and to assist the hardening process of the cement paint. The moisture content should not be present on the surface when the paint is applied. The second coat is applied not less than 24 hours after the first coat. It is essential to keep the surface wet after the final coat for about two days by frequent splashing of water to get the best performance. Some students provided irrelevant answers by copying words of other questions from the same question paper and making them as their responses for this question. For example, one student copied question number 1(i) *circular saw this is the appropriate machine for cutting external curved shapes in woodwork.*

Other students responded by copying question number 1(iii) *the appropriate composition of the paint is 400 litres, 200 litres and 250 litres in 300 m².* In parts (b) and (c), some of these students were able to explain how to prepare cement paint and how to get the quality of painted work. Extract 2.1 is an example of incorrect responses from the student who attempted this question.

3. Suppose you are given a site to paint using various types of cement paint:

(a) What would be the appropriate composition of the paint according to its nature?

Cement paint is composed of
 → gypsum
 → cement
 → colour and
 → chemicals.

(b) How could you prepare the cement paint?

I can prepare cement paint by mixing
 gypsum, chemicals, cement and colour.

(c) What will you do to get the quality of a painting work on the cement painted surface?

how I do to get the quality of painting
 by touching the surface if it is smooth or
 rough but if it is smooth it can be the
 quality of a painting work.

Extract 2.1: A sample of incorrect responses to Question 3

Extract 2.1 shows a sample of students' responses who provided incorrect answers to all parts of the question.

2.2.2 Question 4: Workshop Orientation

This question intended to test students' understanding of basic hand tools, their practical applications, and how they can be effectively used in surface preparation during minor repairs. The question stated that;

Painters and decorators should be able to collect and select basic hand tools to enable surface preparation during minor repairs of computer laboratory. How would you use the following hand tools to repair computer laboratory?

- (a) Claw hammer
- (b) Pincer
- (c) Nail punch
- (d) Wire brush
- (e) Screw driver

The analysis of students' performance showed that 174 (100%) students attempted this question, out of which 64 (36.78%) students scored from 0 to 2.5 marks. Students who scored from 3 to 6 marks were 92 (52.87%) and 18 (10.35%) scored from 6.5 to 10 marks. Generally, the performance of this question was average because 63.22% of the students scored more than 2.5 marks as shown in Figure 4.

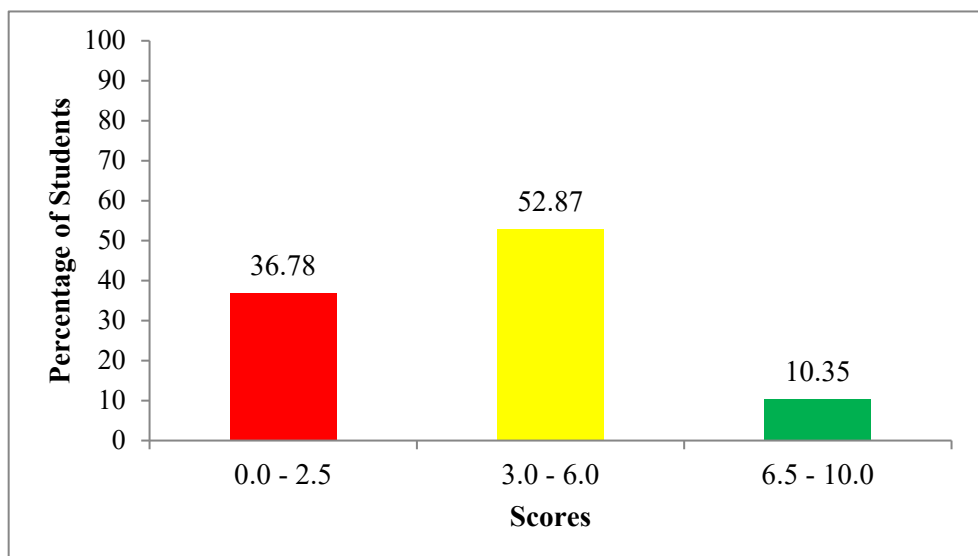


Figure 4: *The Students' Performance in Question 4*

Figure 4 indicates that the overall performance on the question was average, with 110 (63.22%) of the students scoring 2.5 marks and above. The analysis reveals that students who scored average marks were able to respond to the question in some parts, alternating from part (a) to part (e). Further analysis

shows that students who scored from 6.5 to 10 marks had sufficient knowledge of the hand tools. These students managed to explain correctly how would they use the listed tools to prepare the surface during repair of the computer laboratory. Extract 3.1 is a sample of correct responses provided by one of the students who attempted the question.

4. Painters and decorators should be able to collect and select basic hand tools to enable surface preparation during minor repairs of computer laboratory. How would you use the following hand tools to repair computer laboratory?	
(a) Claw hammer	It is used with a better make chisel to chop the grain of the wood or with nail.
(b) Pincer	Used to hold or to cut ^{small} materials such as nail.
(c) Nail punch	Used to punch or dipping the nail.
(d) Wire brush	Used to scrub or to prepare surface to be painted.
(e) Screw driver	Used to screw or to unscrew a screw in wood work.

Extract 3.1: A sample of correct responses to Question 4

Extract 3.1 is a sample of student responses who managed to connect the theoretical knowledge of the tools with their practical applications in the environment of repairing or maintaining a computer laboratory.

Further analysis reveals that 64 (36.78%) students scored 2.5 marks and below. Among these students, the one who scored 0 failed to provide relevant answers on how to use the tools. For example, one student wrote, *Claw hammer is a tool used to bend the wood, Pincer provide appearance of the material, Nail punch is used to punch materials found in computer laboratory, Wire brush is used to connect to get internet and, Screw driver is used to tighten material in computer laboratory.* This is an indication that students in this category lacked knowledge of workshop tools. The primary reasons for these results might be limited practical experience, misinterpretation of the question, or insufficient understanding of how each tool functions in the repair process. Extract 3.2 provides an example of incorrect responses from a student who attempted this question.

4. Painters and decorators should be able to collect and select basic hand tools to enable surface preparation during minor repairs of computer laboratory. How would you use the following hand tools to repair computer laboratory?

(a) Claw hammer
 claw hammer. It is used for cutting wood in order for making furnitures like bed, chair, table.

(b) Pincer
 It enables timber to furnicher to be attractive to the customer to sell.

(c) Nail punch
 To provide pleasing appearance of the material surface.

(d) Wire brush
 To prevent rusting in the material surface.

(e) Screw driver
 To make the material surface to be washable.

Extract 3.2: A sample of incorrect responses to Question 4

Extract 3.2 is a sample of students' responses who failed to explain how to use basic hand tools for the recommended task.

2.2.3 Question 5: Safety Rules and Management

This question tested the student's ability to recall safety procedures, apply them in a practical environment, and demonstrate an understanding of safety in tool operation. The question stated that;

A grinder can be dangerous tool if the user fails to follow safety rules of operating tools. Recommend five safety rules to be followed in order to minimize the risk of the grinder.

The data analysis shows that the question was answered by 174 (100%) students and among them, 69 (39.65%) students scored from 0 to 2.5 marks, 101 (58.05%) students scored from 3 to 6 marks, while 4 (2.30%) students scored from 6.5 to 10 marks. Figure 5 shows the performance of the students in this question.

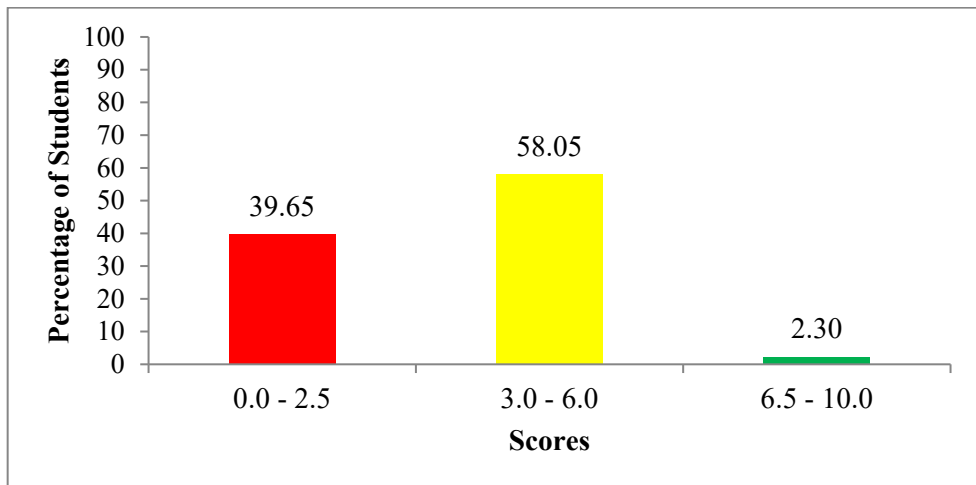


Figure 5: *The Students' Performance in Question 5*

Figure 5 shows that 105 (60.35%) students scored 3 marks and above, indicating average performance. The analysis shows that, these students had basic theoretical knowledge or practical experience of the safety measures associated with grinders. This level of performance reflects good preparation, a clear understanding of the question, and the ability to apply safety rules effectively. Furthermore, it demonstrates that while the students were able to grasp the essential concepts, there are areas for improvement to achieve a higher level of skill. But also, it is likely that students who performed well were well-prepared, had sufficient exposure to grinder related safety training, and could clearly articulate relevant safety measures for minimizing risks. Extract 4.1 is an example of correct responses from the student who attempted this question.

5. A grinder can be dangerous tool if the user fails to follow safety rules of operating tools. Recommend five safety rules to be followed in order to minimize the risk of the grinder.
- Wear protective equipment (PPE) when going to work on grinding machine.
 - Stand against the grinding machine in order to avoid the accident of being thrown by particles.
 - A person should concentrate on his/her work not think about other things when working on grinding machine.
 - Grinding machine should be used for their specific purpose don't use them for the other uses.
 - Keep well grinding tools to avoid the accident.

Extract 4.1: A sample of correct responses to Question 5

Extract 4.1 is a sample of students' responses who managed to recommend safety rules to be followed in order to minimize the risk of the grinder.

On the other hand, 69 (39.66%) students scored below pass marks, among these 23 (33.33%) students scored a 0 mark. This indicates that these students had insufficient knowledge in applying theoretical safety rules to practical situations. Further analysis reveals that students who scored a 0 mark, failed to recommend safety rules to be followed to minimize the risks associated with using a grinder. For example, one student wrote, *Do not play football when working with tools, Do not move working tools in the workshop, Do not enter in the workshop without permission*. Extract 4.2 is an example of incorrect responses from the student who attempted this question.

5.	A grinder can be dangerous tool if the user fails to follow safety rules of operating tools. Recommend five safety rules to be followed in order to minimize the risk of the grinder.	
(a)	.....	.....
(b)	.....	.....
(c)	.....	.....
(d)	.....	.....
(e)	.....	.....

Extract 4.2: A sample of incorrect responses to Question 5

Extract 4.2 is a sample of students' responses who listed personal safety gears instead of safety rules to be followed in order to minimize the risk of the grinder.

2.2.4 Question 6: Painting Materials

This question is designed to test a students' knowledge of varnish and paint as finishing materials, focusing on their composition, purpose, and application process. The question was as follows:

Varnish and paint are two materials used in the finishes works applied on the different surface with the same procedure.

(a) *What is the major difference between the two materials?*

(b) *How do they differ in the process of application?*

A total of 174 students attempted this question, whereas 120 (68.96%) students scored from 0 to 2.5 marks, 50 (28.74%) students scored from 3 to 6 marks and 4 (2.30%) students scored from 6.5 to 10 marks. Generally, the performance of the question was average because 68.77% of the students scored more than 2.5 marks as shown in Figure 6.

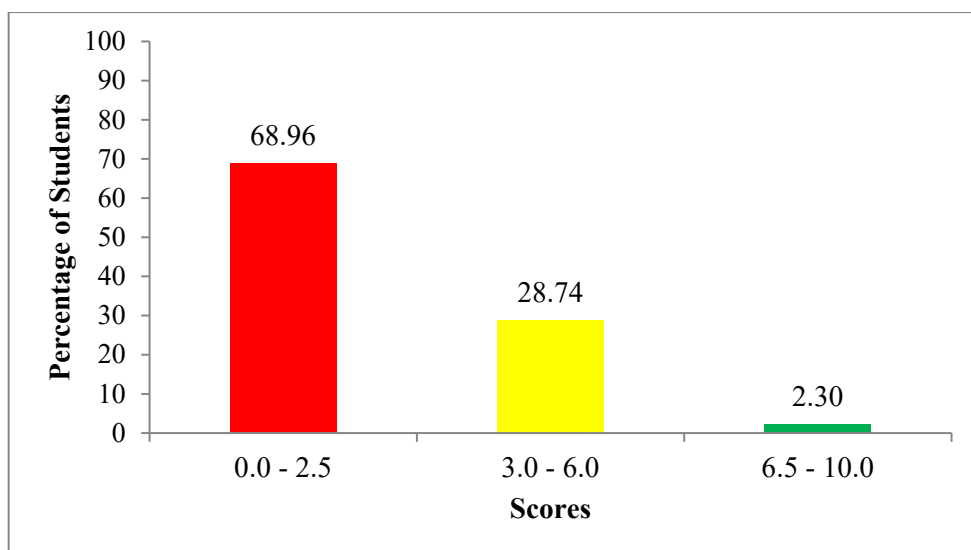


Figure 6: *The Students' Performance in Question 6*

Figure 6 shows that 54 (31.04%) students scored 3 and above, indicating average performance. The analysis shows that most of the students were not able to respond correctly to the question in both parts. In part (a) majority of students failed to accurately distinguish between varnish and paint. For example, one student distinguished these materials as *varnish material is a solvent that is added to the varnish before using to make it easier to be applied*, while *paint material is a pigment that is added to accelerate the paint*. The primary causes of the students' weak performance are likely to be lack of material knowledge and practical experience, difficulty in understanding and interpreting the question. Extracts 5.1 provides an example of incorrect responses from a student who attempted this question.

6. Varnish and paint are two materials used in the finishes works applied on the different surface with the same procedure.

(a) What is major difference of the two materials?

Water varnish and oil varnish

Water varnish → Are the varnish that are hold or mixing to the water because of get good water varnish. while

Oil varnish → Are the varnish that are hold or mixing to the oil and colour because of get good oil varnish surface.

(b) How do they differ in the process of application?

water varnish → This varnish can apply at home, hospital, laboratory

while

Oil varnish → This varnish can apply by some material example Grain, car, Airplane, Bus

Extract 5.1: A sample of incorrect responses to Question 6

Extract 5.1 shows a sample of responses from one of the students who did not accurately distinguish between varnish and paint, and explain their differing application processes.

Further analysis reveals that few students who scored from 6.5 to 10 marks had sufficient knowledge of the painting materials. These students managed to differentiate between varnish and paint in part (a). *They described varnish as a liquid material that forms a transparent layer when applied on a wooden surface to form a protective surface and paint as an organic liquid applied on various surfaces such as walls, wood, and metal.* Furthermore, they explained their differing application process in part (b) as *varnish is mainly applied on wooden surfaces using brushes, rollers, and spray guns, and paint is applied to walls, metal, and wooden surfaces using brushes, rollers, and spray guns.*

Extract 5.2 shows a sample of correct responses provided by one of the students.

6. Varnish and paint are two materials used in the finishes works applied on the different surface with the same procedure.

(a) What is major difference of the two materials?

Varnish is a resinous solution forming hard transparency coating when it is applied with the thin in the surface while Paint is a solid or liquid material which is applied to the surface for the purpose, decoration, identification, and preservation.

(b) How do they differ in the process of application?

Varnish is mostly applied with the spraying process to the wood surface to protect and improve the appearance of furniture articles. Paint is applied with any of the method such as brushing or rolling to the wall surface or other surfaces such as wood or metal.

Extract 5.2: A sample of correct responses to Question 6

Extract 5.2 shows a sample of responses from one of the students who managed to distinguish between varnish and paint, and explain their differing application processes.

2.2.5 Question 7: Colour

This question intended to assess knowledge of colour, the ability to compare and differentiate related concepts, and the application of colour concepts in painting. The question was as follows:

Differentiate the following colour as used in painting works:

(a) *Paste colour and retiring colours*

(b) *Split complementary and complimentary colours.*

A total of 174 students attempted this question, out of whom 144 (82.76%) students scored from 0 to 2.5 marks, 29 (16.67%) students scored from 3 to 6 marks and 1 (0.57%) student scored 8 marks.

The performance of students in this question was weak, as the majority of them (82.76%) scored below the average marks. Figure 7 summarizes students' performance in this question.

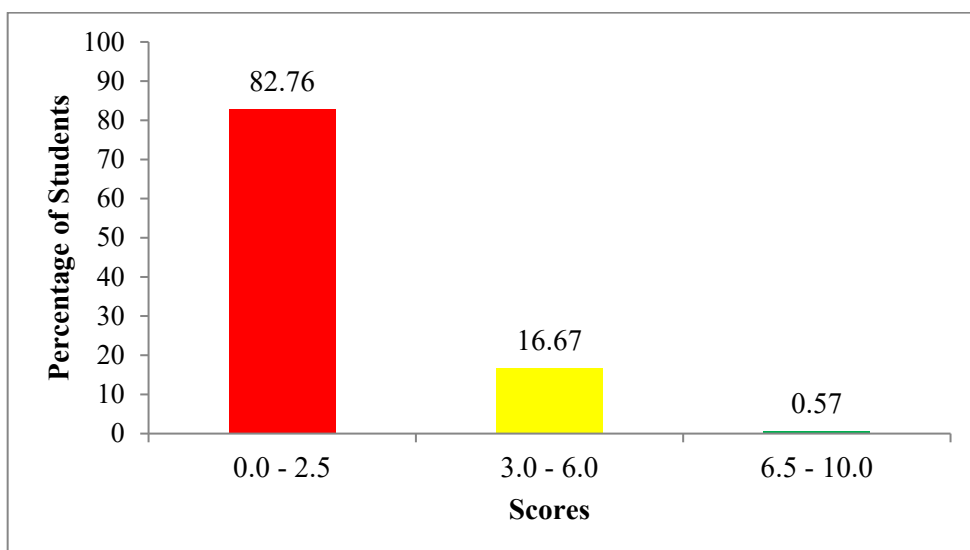


Figure 7: The Students' Performance in Question 7

Among 144 (82.76%) students who scored below the average marks, 64.58% scored zero marks as they completely failed to answer the question correctly in both parts of the question.

Figure 7 illustrates that the general performance of the students in this question was poor, as 30 (17.24%) students scored 3 to 10 marks. Majority of these students in part (a) were unable to correctly differentiate between retiring and paste colours. For example, one student distinguished these materials as follows; *paste colour is the colour that is applied on the surface through the parting method*, while *retiring colour is the colour that is applied on the surface by means of shading*.

In part (b) the students failed to differentiate between split complementary and complimentary colours. For instance, one students wrote *split complementary colour is the colour that is obtained after mixing two secondary colours* and *complimentary colour is the colour that is obtained by mixing up two split complementary together*. The weak performance on this question may be due to insufficient knowledge of colour theory, confusion about terminology, and possibly a lack of practical experience with colour application in painting. Extract 6.1 provides an example of incorrect responses from a student who attempted this question.

7. Differentiate the following colour as used in painting works:

(a) Paste colour and retiring colours

Paste colour is a form of colour that formed with
discordant colour in the colour scheme.

Retiring colours is a form of colour that formed with a
discordant colour in the colour scheme.

(b) Split complementary and complimentary colours.

Split complementary colours are colours that are divided
from the complementary colours while
Complimentary colours are colours that are same from or
produced by the monochromatic colour.

Extract 6.1: A sample of incorrect responses to Question 7

Extract 6.1 shows a sample of responses from one of the students who provided irrelevant answers in parts (a) and (b).

Apart from students' weak performance, 17.24% of students scored above-average marks. The majority of these managed to provide partial answers to some parts of the question. The students' responses revealed that they had little knowledge and practical in experience in colour concepts. Extract 6.2 is an example of correct responses from the student who attempted this question.

7. Differentiate the following colour as used in painting works:

(a) Paste colour and retiring colours

Paste colour - is a colour which is obtained naturally. example Blue, Red and Yellow. WHILE
Retiring colours - is a types of a colour which is obtained by mixing two Paste colour. example of retiring colour is orange, green and Purple.

(b) Split complementary and complimentary colours.

SPLIT complementary - is a using of one dominant colour and two colours in colour scheme. WHILE
Complimentary colours - is a using on two colour opposite to each other in colour scheme.

Extract 6.2: A sample of correct responses to Question 7

Extract 6.2 shows a sample of responses from one of the students who provided correct answers in parts (a) and (b).

2.2.6 Question 8: Water Paints

This question assessed the students' capacity for independent thinking as well as judgment. It specifically evaluates a student's capacity to convince the school administration to select water-based paint over oil paint by using reasoning and supporting facts, as well as any possible obstacles that may arise throughout the process of making decisions. The question was as follows:

The school management planned to paint classrooms but they still have difficulties in making decision on the type of paint to be used.

- (a) *Convince them to use water paint instead of oil paint by providing five facts.*
- (b) *Despite having convinced the school management to use water paint, remind them about five disadvantages of it.*

This question was answered by 174 (100%) students. Among them, 15 (8.62%) scored from 6.5 to 10 marks, which is good performance; 116 (66.67%) scored from 3 to 6 marks, which is average performance; and 43 (24.71%) scored from 0 to 2.5 marks, which is weak performance. Among 43 (24.71%) students who scored below the average mark, 12 (27.91%) scored zero marks because they absolutely failed to answer the question correctly. The general performance on this question was good since 131 (75.29%) scored from 3 to 10 marks. Their overall performance on the question is summarized in Figure 8.

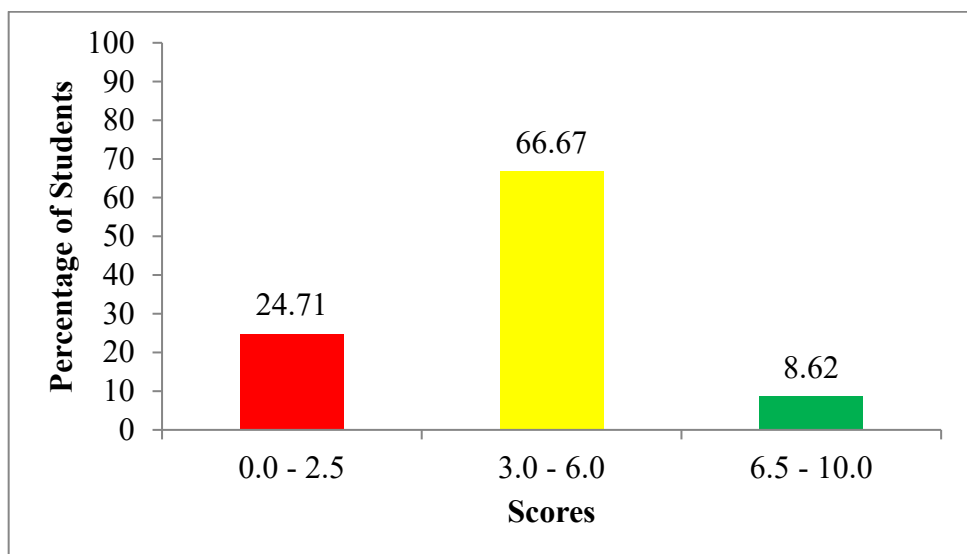


Figure 8: *The Students' Performance in Question 8*

Figure 8 indicates that the general performance on this question was good, as 131 (75.29%) students scored average and above marks. Among all students who attempted this question, there were 15 (8.62%) students who scored higher marks 6.5-10 provided relevant responses as per the requirements of the question. However, 116 (66.67%) students who scored average marks (3 to 6) were able to give a correct response to one part of the question or mix correct and incorrect responses for both parts. For example, one student managed to answer correctly in part (a) but failed the whole of part (b). This indicates that she/he had partial knowledge of both water paint and oil paint. Extract 7.1 shows a sample of correct responses provided by one of the students.

8. The school management planned to paint classrooms but they still have difficulties in making decision on the type of paint to be used. (a) Convince them to use water paint instead of oil paint by providing five facts. (i) It is non-flammable (ii) It has low cost (not expensive) (iii) It can dry very quickly (iv) It is easy to apply with simple tools (v) It has no toxic fumes to users (b) Despite having convinced the school management to use water paint, remind them about five disadvantages of it. (i) It is non-washable so can be removed when washed with water (ii) It is not durable than oil paint (iii) It does not stick well to the surface as oil paint (iv) It can be affected by weather conditions (v) It is not strong as oil paint
--

Extract 7.1: A sample of correct responses to Question 8

Extract 7.1 shows a sample of responses from a student who managed to convince the school management to use water paint instead of oil paint, and despite having convinced them, the student reminded them about the disadvantages of water-based paint.

Further analysis reveals that 43 (24.71%) students scored poor marks in the question. These students lacked knowledge of water paint and oil paint as most of them provided irrelevant answers. For example, in part (a), one student selected water-based paint over oil paint by providing the following reasons; *water paint has good appearance, water paint is applied directly over oil based paint and water paint has good appearance.*

Consequently, in part (b), they failed to produce the disadvantages of using water paint. For example, one student responded; *that it cannot function when oil is used as a thinner, it is easier to be removed by water, it provides bad appearance and it is only used for walls*. Extract 7.2 is an example of incorrect responses taken from one of the students' scripts.

8. The school management planned to paint classrooms but they still have difficulties in making decision on the type of paint to be used.

(a) Convince them to use water paint instead of oil paint by providing five facts.

- (i) Water paint it is durable
- (ii) Water paint it is long last
- (iii) Water paint it is decorative
- (iv) Water paint it is does not affected by weather
- (v) Water paint it is does not bring of sense of seeing

(b) Despite having convinced the school management to use water paint, remind them about five disadvantages of it.

- (i) It is have is not bleed when not applying good
- (ii) It is is Saponticate when not applied well
- (iii) It is faint when not applied well
- (iv) It is Flaking when not applied well
- (v) It is Cracking when not applied well

Extract 7.2: A sample of incorrect responses to Question 8

Extract 7.2 shows a sample of responses from a student who produced poor responses by failing to give the reasons for selecting water-based paint instead of oil-based paint and the disadvantages of water paint.

2.2.7 Question 9: Tie Dyeing

This question assessed students' knowledge of dyes and their uses in real-life situations. The question was as follows:

Provide the uses of the following types of dyes:

- (a) Direct dyes
- (b) Acidic dyes

The analysis of students' performance shows that out of 174 students who attempted this question, 158 (90.81%) scored from 0 to 2.5 marks, with 118 students scoring zero marks. Moreover, 7.47% of students scored from 3 to 6 marks, while 3 (1.72%) managed to score from 6.5 to 10 marks. The distribution of students' performance in this question is summarized in

Figure 9.

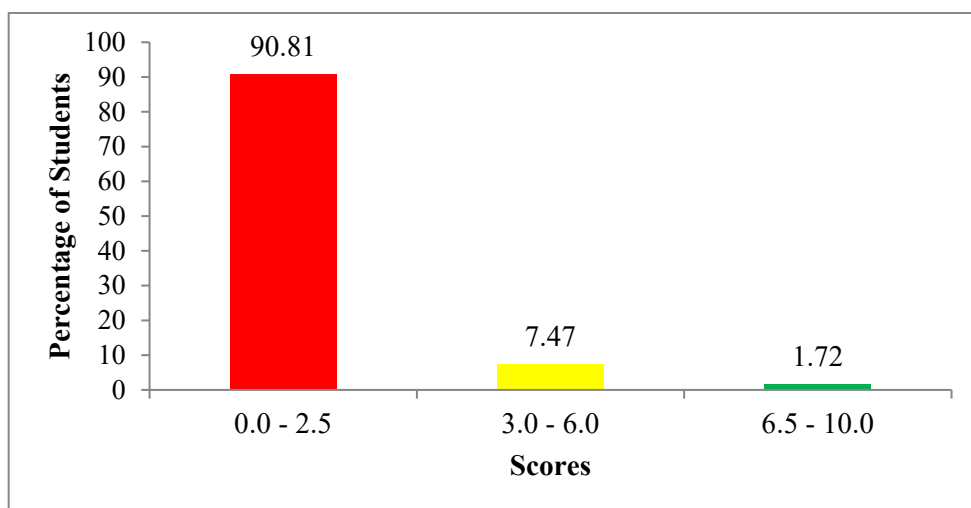


Figure 9: The Students' Performance in Question 9

Generally, a large number of students scored poorly, with 118 out of 174 students scoring zero. This indicates that a majority of students may not have studied the topic of *tie-dyeing* or may have been unfamiliar with the specific uses of direct dyes and acidic dyes. Most of the students failed to provide the uses of direct dyes and acidic dyes. In part (a), they responded, *direct dyes are dyes applied by people using a pair of scissors, or clothes direct on the surface*. Some students provided irrelevant answers by copying words of other questions from the same question paper and making their responses for this question. For example, one student copied question number 2(iii) to provide a pleasing appearance of the material surface. In part (b), they also failed to produce the uses of acidic dyes by writing that; *acidic dyes are used to produce colour in fabrics that are free from dust*. Extract 8.1 is a sample of incorrect responses to this question.

9. Provide the uses of the following types of dyes:

(a) Direct dyes

Direct dyes is used for drying water based paint.

(b) Acidic dyes

Acidic dyes is used for drying oil based paint.

Extract 8.1: A sample of incorrect responses to Question 9

Extract 8.1 shows a sample of responses from one of the students who provided irrelevant answers in parts (a) and (b).

Apart from students' weak performance, 9.19% of students scored average marks. The majority of these students managed to provide partial answers to some parts of the question. The students' responses revealed that they had little knowledge and practical in experience in tie-dyeing concepts. Extract 8.2 is an example of correct responses from the student who attempted this question.

9. Provide the uses of the following types of dyes:

(a) Direct dyes

Direct dyes - This is the type of dye which applied on the surface of fabrics by touching or putting the fabric on it directly; it is ~~used~~

- It is used to provide the new pattern design on the fabric
- It is used to provide the good appearance of the fabric.
- It is used when the faster dyeing is required

(b) Acidic dyes

Acidic dyes - This is the type of dye which is applied to the surface of fabrics and it contains the acidic material to its composition

- It is used to increase the durability and stability of the fabrics
- It is used to increase the attraction of the fabric to the users.

Extract 8.2: A sample of correct responses to Question 9

Extract 8.2 shows a sample of responses from one of the students who provided relevant answers in parts (a) and (b).

2.3 SECTION C: STRUCTURED QUESTION

This section consisted of one question, weighing 15 marks. The score ranges used for grading the performance of students in this section are indicated in Table 3.

Table 3: Score Ranges for Grading Students' Performance in Question 10.

Scores Range	General Performance
0.0 – 4.0	Weak
4.5 – 9.5	Average
10.0 – 15.0	Good

2.3.1 Question 10: Painting Materials

The question intended to assess reasoning, problem-solving, mathematical skills, and practical application in painting fields. The question was as follows:

Suppose you have to supply painting materials at a computer laboratory owned by a government school having 20 m length, 6 m width, 8 m height with door and window opening being 4 m² and 15 m²;

- Which nine criteria would you consider when selecting the appropriate painting materials for your tender?*
- How much will the project cost if 5 litres of painting materials which is sold at Tsh 8000 per litre was used to paint 35 m² of surface and 25% of this cost was used as labour charge?*

A total of 174 (100%) students attempted this question, where 87 (50.00%) students scored from 0 to 4 marks, 86 (49.43%) students scored from 4.5 to 9.5 marks, and 1 (0.57%) student scored above average marks. Figure 10 shows the trend of students' performance in question 10.

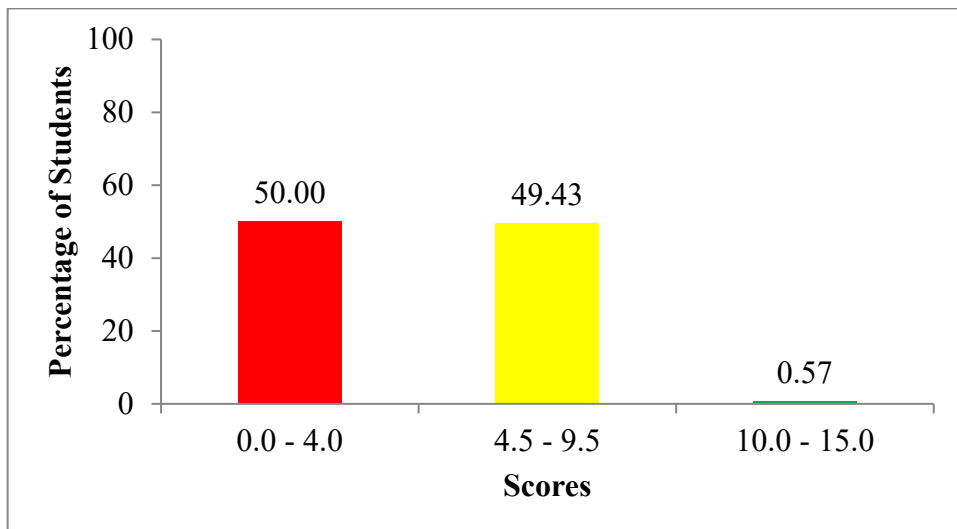


Figure 10: The Students' Performance in Question 10

Figure 10, indicates 87 (50%) students scored from 4.5 and 15, showing an average level of performance. These students were relatively able to give correct responses in parts (a) and (b) of the question. In part (a), majority of the students correctly managed to state the criteria for selecting the appropriate painting materials. Examples of such correct responses were; *spreading capacity, opacity of the paint, durability, drying speed and consistency*. In part (b), they managed to score few marks due to their partial mathematics skills as they were able to find the area but failed to find the cost. The Overall responses of students demonstrate a satisfactory understanding of painting materials. Extract 9.1 is a sample of correct responses from a student who attempted this question.

10. Suppose you have to supply painting materials at a computer laboratory owned by a government school having 20 m length, 6 m width, 8 m height with door and window opening being 4 m^2 and 15 m^2 ;

(a) Which nine criteria would you consider when selecting the appropriate painting materials for your tender?

- (i) The Spreading Capacity of the painting material
The appropriate painting materials should have the high Spreading Capacity
- (ii) The Opacity of the painting Materials
It should be Opaque when applied to the surface
- (iii) The Constituency of the painting Materials
It should have a proper constituents
- (iv) The Viscosity of the painting Materials
It should have the high viscous
- (v) The stability of the painting Materials
It should be stable and strong
- (vi) The durability of the painting Materials
The appropriate painting material should be durable
- (vii) The drying rate of the painting Materials
The good paint should have the moderate drying rate
- (viii) The availability of the painting Materials
The appropriate painting materials should be available.
- (ix) The flexibility of the painting Materials
The good painting materials should be flexible

(b) How much will the project cost if 5 litres of painting materials which is sold at Tsh 8000 per litre was used to paint 35 m² of surface and 25% of this cost was used as labour charge?

Soln

Given
 $5 \text{ litres} = 35 \text{ m}^2$

1 litre = 8000; 25% of this cost for labour charge

Dimensions: 20m, 6m, 8m
 $\text{Volume} = (20 \times 6 \times 8) \text{ m}^3$

$\text{Area} = (20 \text{ m} \times 8 \text{ m}) 2 + (8 \text{ m} \times 6 \text{ m}) 2$
 $= 320 \text{ m}^2 + 96 \text{ m}^2 = 416 \text{ m}^2$

Wall Surface = Full area - openings (window and door)
 $= 416 \text{ m}^2 - (4 \text{ m}^2 + 15 \text{ m}^2)$
 $= 397 \text{ m}^2$

Then
 $1 \text{ litre} = 8000 \text{ Tsh}$
 $5 \text{ litres} = ?$
 $= 40000 \text{ Tsh}$

$5 \text{ litres} = 35 \text{ m}^2$
 $? = 397 \text{ m}^2$
 $= 56.7 \text{ litres}$

Then,
 $5 \text{ litres} = 40,000 \text{ Tsh}$
 $56.7 \text{ litres} = ?$

$\frac{5 \text{ litres} \times}{5 \text{ litres}} = \frac{40,000 \text{ Tsh} \times 56.7 \text{ litres}}{5 \text{ litres}}$
 $= 453600 \text{ Tsh}$

labour charge = $\frac{25}{100} \times 40,000$
 $= 10,000 \text{ Tsh}$

labour charge, 5 litres = 10,000 Tsh
 $56.7 \text{ litres} = ?$
 $\frac{56.7 \times 10,000}{5 \text{ litres}} = \frac{5 \text{ litres}}{5 \text{ litres}}$
 $x = 113400 \text{ Tsh}$

The total cost = Labour charge + Litres cost.
 $= 113400 \text{ Tsh} + 453600 \text{ Tsh}$
 $= 567000 \text{ Tsh}$

$\therefore$ The total cost of the project is 567,000 Tsh.

Extract 9.1: A sample of correct responses to Question 10

Extract 9.1, shows a sample of students' work done who provided correct responses in parts (a) and (b) of the question.

Further analysis shows that the other 87(50%) students scored poor marks. The majority of the students performed poorly in all parts of the question, indicating that either they did not understand the requirement of the question or lacked knowledge of the paint materials and had poor mathematical skills. Examples of the responses from students include: *the economic status of the*

painter, the percentage composition of paint ingredients, the size of the area to be painted, and painting tools. Extract 9.2 is an example of responses from a student who responded poorly.

10. Suppose you have to supply painting materials at a computer laboratory owned by a government school having 20 m length, 6 m width, 8 m height with door and window opening being 4 m² and 15 m²;

(a) Which nine criteria would you consider when selecting the appropriate painting materials for your tender?

- The window and door should be active and do not died
- The door and window should stand for long time
- The window and door should be clean.
- The window and door is use the trangle, etrowel and other tools for painting
- The door and window is used to control the material
- The door and window is used to prevent accident
- The window and door is the used to classes class and to open
- The door and window there is materials for tender
- The window and door is select to a proper painting

(b) How much will the project cost if 5 litres of painting materials which is sold at Tsh 8000 per litre was used to paint 35.m² of surface and 25% of this cost was used as labour charges?

20m length	
6 m width	
8 m height	
$(20 \times 2) + (6 \times 8) =$	
$160 \times 2 + 48 \times 2$	
$320 + 96$	
Area = 416 m ²	
Window opening 4m ² and 15m ²	
5 litres	
Tsh 8000 per litres	
35 m ²	
25% cost	
cost	
8000×5	
40,000 Tsh. litres	

Extract 9.2: A sample of incorrect responses to Question 10

Extract 9.2, shows a sample of students' responses who provided incorrect answers to all parts of the question.

3.0 THE STUDENTS' PERFORMANCE ON EACH TOPIC

The Woodwork and Painting Engineering paper for FTNA 2024 had ten topics that were assessed. These topics are *Workshop Orientation*, *Safety Rules and Management*, *Painting Materials*, *Signwriting and Stencilling*, *Colour*, *Oil Paints*, *Painting Technique*, *Varnishes and Finishes*, *Introduction to Painting*, *Water Paints* and *Tie Dyeing*.

The analysis of students' performance shows that the students attained good performance in question 1 which was a multiple-choice item (79.89%). The items were composed from general knowledge of various topics such as; *Workshop Orientation*, *Safety Rules and Management*, *Painting Materials*, *Signwriting and Stencilling*, *Colour*, *Oil Paints*, *Painting Technique*, and *Varnishes and Finishes*. Good performance was also observed in question 2 which covered the topic of *Varnishes and Finishes* (83.33%) and question 8 on the topic of *Water Paints* (75.29%). The good performance of these topics is a result of the students' adequate knowledge and practical skills of the topic tested and correct interpretation of the questions.

On the other hand, the average performance was observed in question 4 (63.22%) on the topic of *Workshop Orientation*, question 5 (60.35%) on the topic of *Safety Rules and Management*, question 6 (31.04%) on the topic of *Painting Materials* and question 10 (50.00%) on the topic of *Painting Materials*.

The weak performance was observed in question 3 on the topic of *Introduction to Painting* (14.37%), question 7 on the topic of *Colour* (17.24%) and question 9 on the topic of *Tie Dyeing* (9.19%). The weak performance was attributed to insufficient knowledge and poor skills of the concepts tested and lack of practical skills.

The performance of students on different topics and questions is summarized in Appendices I and II respectively.

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

The summary of the distribution of students' performance in Table 1 shows that the general performance in the Woodwork and Painting Engineering subject was average since 73 (41.95%) students scored 30 marks and above.

However, some students had weak performance, which was attributed to different factors as explained in the analysis of each question. These include; lack of sufficient knowledge and inadequate practical skills of the tested subject matters, poor mathematical and drawing skills and failure to determine the demand of the questions. Further analysis shows that students with average and good scores were competent in the assessed topics as they provided correct responses as per the requirements of the questions.

4.2 Recommendations

In order to improve and achieve better performance for students in Woodwork and Painting Engineering subject, the following are recommended:

- (a) In the teaching and learning process, teachers and students should adhere to teaching and learning strategies emphasized in the syllabus for better students' acquisition of knowledge in the given topics. Additional efforts are required to address low-achieving and underperforming topics.
- (b) For students to apply theories to real-life situations and eventually get the required competencies, teachers should assist them in obtaining practical abilities by practicing learn by doing approach.
- (c) Students should be guided and encouraged to read various woodwork and painting engineering books to widen their knowledge and skills.
- (d) Students should develop the culture of reading questions carefully before attempting them so that they understand the requirements of the questions.

Appendix I

Analysis of the Students' Performance Per Topic

S/N	Topic	Question Number	Percentage of Students who Scored 30% or More	Remarks
1	Workshop Orientation, Safety Rules and Management, Painting materials, Signwriting and Stencilling, Colour, Oil paints, Painting techniques, Varnishes and Finishes	1(Multiple Choice Items)	79.89	Good
2	Varnishes and Finishes	2	83.33	Good
3	Water paints	8	75.29	Good
4	Workshop Orientation	4	63.22	Average
5	Safety Rules and Management	5	60.35	Average
6	Painting materials	6 & 10	40.52	Average
7	Introduction to Painting	3	14.37	Weak
8	Colour	7	17.24	Weak
9	Tie Dyeing	9	9.19	Weak

Analysis of the Students' Performance Per Question

S/N	Topic	Question Number	Percentage of Students Who Scored 30% or More	Remarks
1	Workshop Orientation, Safety Rules and Management, Painting materials, Signwriting and Stencilling, Colour, Oil paints, Painting techniques, Varnishes and Finishes	1	79.89	Good
2	Varnishes and Finishes	2	83.33	Good
3	Water Paints	8	75.29	Good
4	Workshop Orientation	4	63.22	Average
5	Safety Rules and Management	5	60.35	Average
6	Painting Materials	6	31.04	Average
7	Painting Materials	10	50.00	Average
8	Introduction to Painting	3	14.37	Weak
9	Colour	7	17.24	Weak
10	Tie Dyeing	9	9.19	Weak

