THE NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

CANDIDATES' ITEM RESPONSE ANALYSIS REPORT FOR THE CERTIFICATE OF SECONDARY EDUCATION EXAMINATION (CSEE) 2018

071 BUILDING CONSTRUCTION

THE NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

CANDIDATES' ITEM RESPONSE ANALYSIS REPORT FOR THE CERTIFICATE OF SECONDARY EDUCATION EXAMINATION (CSEE) 2019

071 BUILDING CONSTRUCTION

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

CONTENTS

FOREWORD iv
1.0 INTRODUCTION 1
2.0 THE ANALYSIS OF THE CANDIDATES' PERFORMANCE PER QUESTION 2
2.1 Section A: Multiple Choice and Matching Items 2
2.1.1 Question 1: Multiple Choice Items 3
2.1.2 Question 2: Matching Items 5
2.2 Section B: Short Answer Questions 7
2.2.1 Question 3: Construction Materials - Mortar 7
2.2.2 Question 4: Wall 9
2.2.3 Question 5: Site Preparation 10
2.2.4 Question 6: Windows 12
2.2.5 Question 7: Floors 14
2.2.6 Question 8: Foundation 16
2.2.7 Question 9: Stair and Stair case 18
2.2.8 Question 10: Scaffolding and Shoring 20
2.3 Section C: Structured Question 22
2.3.1 Question 11: Drainage 22
2.3.2 Question 12: Floors 25
2.3.3 Question 13: Foundation 30
2.3.4 Question 14: Column and Beams 33
3.0 ANALYSIS OF THE CANDIDATES' PERFORMANCE PER TOPIC 36
4.0 CONCLUSION AND RECOMMENDATIONS 37
4.1 CONCLUSION 37
4.2 RECOMMENDATIONS 37
Appendix A 39
Appendix B 40

FOREWORD

The Candidates' Item Response Analysis Report in Building Construction subject, for the candidates who sat for Certificate of Secondary Education Examination (CSEE) 2019, has been prepared to provide feedback to education stake holders about the performance of the candidates and the challenges they encountered in attempting examination questions.

The Certificate of Secondary Education Examination marks the end of the four years of Ordinary Secondary Education. It is a comprehensive evaluation which among other things shows the effectiveness of the education system in general and the education delivery system in particular. Essentially, the candidates' responses to the examination questions is a strong indicator of what the education system was able or unable to offer to the students in their four years of Ordinary Secondary Education.

The analysis presented in this report is intended to contribute towards understanding the possible reasons behind the candidates' responses in the subject of Building Construction. The report highlights the factors that contributed to the failure of the candidates to score high marks. Such factors include failure to identify the task of the questions, inability to follow instructions and lack of though knowledge on the concepts related to the subject. The feedback provided will enable the educational administrators, school managers, teachers, students and other stakeholders to assess the teaching and learning environment so as to take proper measures in order to improve the candidates' performance in the future national examinations.

Finally, the Council would like to thank the Examination Officers, and those who participated in analyzing the data used in this report, typesetting of the document and in reviewing the report.

Dr. Charles E. Msonde

EXECUTIVE SECRETARY

1.0 INTRODUCTION

This report analyses the performance of the candidates who sat for the Certificate of Secondary Education Examination (CSEE) 2019 in Building Construction for both school and private candidates. The paper covered Civil Engineering Syllabus for Secondary Education of 1994 which was set in accordance with the Examination Format of 2019, which is revised version of the 2008 format.

The building construction paper had fourteen (14) questions divided into sections A, B and C. The candidates were required to answer all the questions in sections A and B and three (3) questions from section C. Section A consisted of two (2) questions where by question 1 carried 10 marks and question 2 carried 5 marks. Section B consisted of eight (8) questions each carrying 5 marks. Section C consisted of four (4) questions each carrying 15 marks. The candidates were required to attempt any three questions from this section.

The candidates who sat for the examination in 2019 were 391. In 2018 a total of 503 candidates sat for the examination showing a decrease of 22.3 percent compared to the candidates of 2019. Among the candidates who sat for the paper in year 2019, only 1 (0.3%) candidate scored credit pass grade B while 80 candidates (20.5%) scored credit pass grade C and 152 (38.85%) passed with grade D. The rest, 158 (40.41%) candidates failed by obtaining grade F.

The analysis shows that, there was increase of performance by 18.69 percent compared to that of 2018. Generally, a total of 233 candidates (59.59%) out of 391 passed while 158 (40.41%) failed. The distribution of scores and candidates' performance is shown in Figure 1.

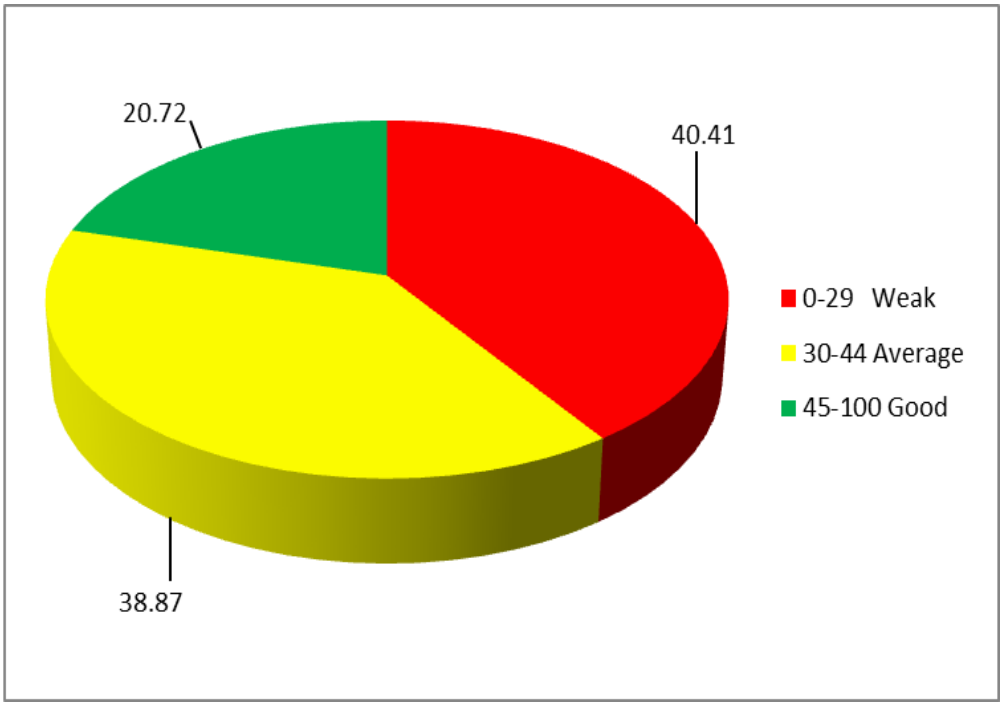


Figure 1: The Distribution of Candidates Performance in Percentage in the year 2019

During the analysis the requirement of each question, candidate's strengths and weaknesses in responding to questions are identified. Extracts of the candidates good or poor responses are used to illustrate the cases presented. At the end, conclusion and recommendation has been put forward to help education stakeholders to take necessary measures in improving future candidate's performance in CSEE.

2.0 THE ANALYSIS OF THE CANDIDATES' PERFORMANCE PER QUESTION

2.1 Section A: Multiple Choice and Matching Items

This section consisted of two questions, question 1 had 10 multiple choice items each carrying 1 mark making a total of 10 marks. Question 2 had 5 matching items each carrying 1 mark making a total of 5 marks. The score ranges used for grading candidates' performance in this section has been shown for each question. Candidates are considered to have passed if they score grade D and above.

2.1.1 Question 1: Multiple Choice Items

The score ranges used for grading performance of candidates for this question is shown in Table 1. The candidate's pass mark is grade D and above.

Table 1: Score Range for Candidates' Performance in Question 1

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

Question 1 consisted of ten (10) multiple choice items derived from various topics in the syllabus. The topics covered were *timber, roof, walling, door and window, chimney, drainage* and *beam*. The candidates were required to choose the correct answer from the given five alternatives by writing the letter of the correct alternative beside the item number.

A total of 391 (100%) candidates attempted this question, whereby 39.6 percent scored 0 to 2 marks, of which 4.6 percent scored a 0 mark. A total of 234 (59.9%) candidates scored 3 to 7 marks while 0.5 percent of the candidates scored 8 to 10 marks.

The general performance by the candidates on question was of average as 60.36 percent of the candidates scored above the pass mark. The summary of candidate's scores on this question is presented in Figure 2.

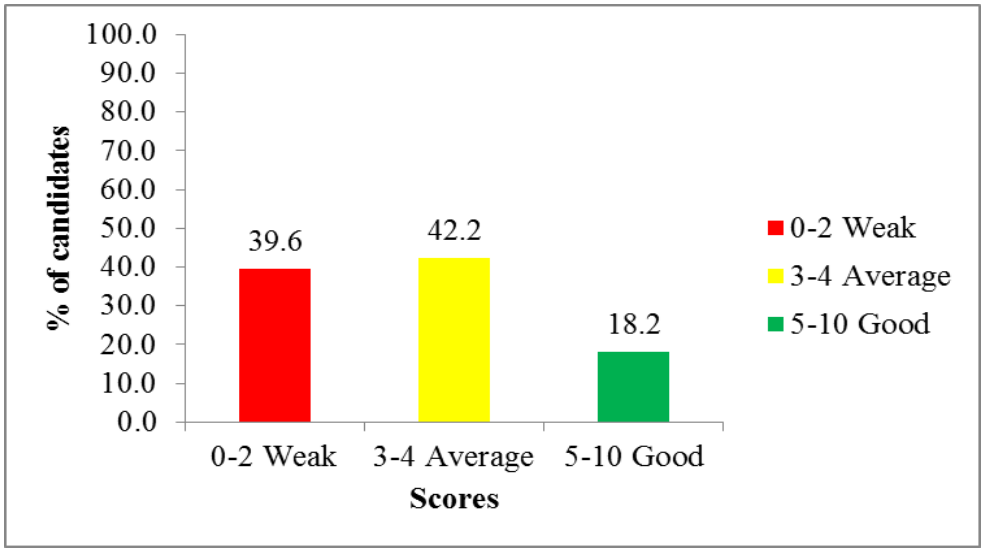


Figure 2: Candidates Performance on Question 1

Figure 2 shows that, most of the candidates (60.4%) passed. These candidates managed to score 3 to 8 marks. This implies that they had enough knowledge on various topics tested. The items which were correctly responded to most of the candidates in this question were; (ii), (iv) and (v) from the following topics of *roof, walling,* and *door and window*.

On the other hand, 39.6% of the candidates who scored 0 to 2 marks lacked enough knowledge on the tested concept. Most of the candidates in this group failed to recall the fact of different given statements, thus failed to select correct alternatives. Items (i), (viii) and (ix) from topics of *timber, drainage* and *beam* respectively were the mostly poor performed as compared with the other items.

For example in item (i), which required the candidates to identify the simplest and most economical method for conversion of light timber (construction materials) most of the candidates opted for B, *Tangetial* instead of D, *live sawing*. The choice of this distractor shows that the candidates had inadequate knowledge on timber conversion. They opted for a common method of timber conversion instead of the correct method.

Moreover, in item (viii), the candidates were required to identify the type of roof member laid over the rafter to support the tiles in pitch roof. Most of the candidates chose D, *jack raft* instead of B, *Batten*. The candidates failure in this item showed that they lacked practical skill in roof constrcution and the

word *rafter* which appeared in the distracors led them to opt for an incorrect response.

Similary in item (ix) the candidates were required to identify the size of horizontal waste pipe commonly used regarding house drainage. The candidates were given five ranges of waste pipe but most of them failed to chose the correct range because they lacked knowledge in house drainage. These candidates were confused by the common experience of using 100 mm size in house drainage. Thus most of them selected range A (100 mm to 150 mm) instead of the correct range which was response E, (30 mm to 50 mm).

2.1.2 Question 2: Matching Items

The question required the candidates to match items (i - v) in List A with responses in List B by writing the letter of the corresponding response beside the item number. Each item in this question carried 1 mark, making a total of 5 marks. The question was designed to test the candidates' knowledge about description of hinges.

The score ranges used to grade candidates performance in this question is presented in Table 2.

Table 2: Score range for Candidates' Performance in Question 2

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

This question was attempted by 389 (99.5%) candidates; whereby 58.36 percent scored 0 to 1 mark, out of which 23.7 percent scored a 0 mark. A total number of 139 (35.73%) scored 2 to 3 marks while 23 (5.91 %) candidates scores 4 to 5 marks. Only 1 candidate scored all allotted marks (5) for this question.

The performance on this question was generally of average as 41.64 percent of the candidates scored above pass mark. The summary of candidate's scores is presented in Figure 3.

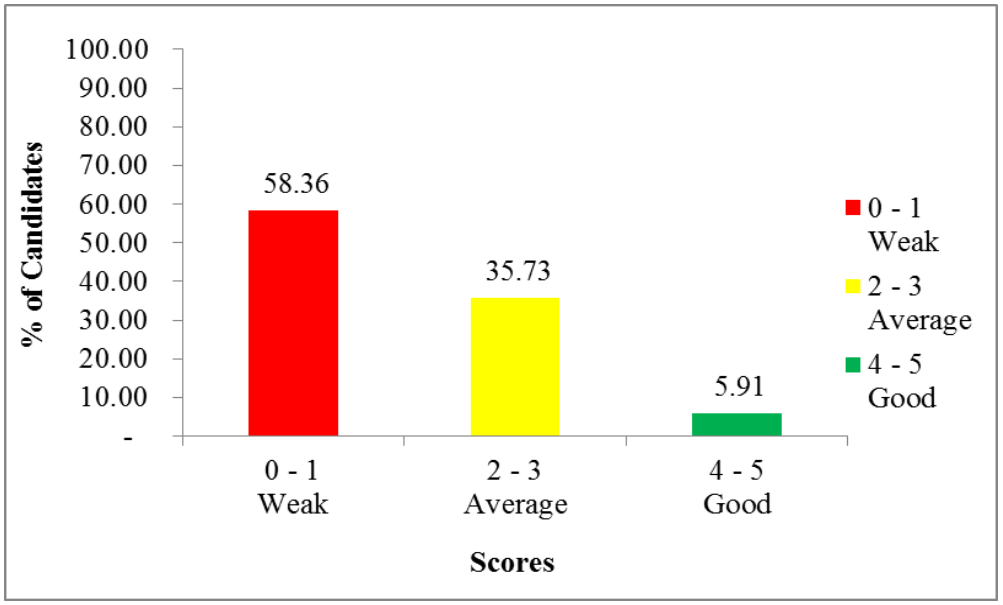


Figure 3: Candidates Performance on Question 2

As Figure 3 shows, majority of the candidates (58.36%) performed poorly on this question. This is due to lack of knowledge regarding the iron monger. The candidates failed to match the correct types of the iron mongery with the correct function of each type.

For example, items (iii) and (iv) were poorly performed by the majority of the candidates. The reason was that, the candidates confused strap hinges with tee hinges. These two hinges serve the same purpose but strap hinges can be used as a substitute of garnet hinges (T – hinges). Strap hinge is the modern hinge compared to tee hinge.

However, the rest of the candidates (41.64%) scored pass mark and above. Majority of the candidates in this group were able to match correctly items (i), (ii) and (v). In item (i) the candidates were required to identify common hinges used to fix doors and window shutters to the frame. The correct response was *butt hinge*. This is the common types of hinges, therefore it was easier for them to remember due to its uses. In item (ii) the candidates were required to identify the type of hinge used for swinging doors. The correct response was the *spring hinge.* Most of the candidates were able to get the correct answer. In item (v) the candidates were required to identify the type of hinge used for room doors with a carpet also used in place of ordinary butt hinge. It was easier for the candidates to select B, *rising hinge* because it is

clear that the door needs to be opened without causing damage to the carpet therefore it needs a rising hinge.

2.2 Section B: Short Answer Questions

This section consisted of questions 3 to 10, each carrying 5 marks. The score ranges used for grading the performance of candidates in this section is as indicated in Table 3.

Table 3: Score Ranges for Candidates' Performance in Questions 3 to 10

Scores range (marks)	General Performance	
	Remark	Grade
0 - 1	Weak	F
1.5 - 3	Average	C - D
3.5 - 5	Good	A - B

2.2.1 Question 3: Construction Materials - Mortar

This question required the candidates to list four properties of sand suitable for preparation of mortar.

The question was attempted by 378 (96.7%) candidates; whereby 47.9 percent scored 0 to 1 mark out of which, 30.4 percent scored a 0 mark. A total number of 152 (40.21%) candidates scored 1.5 to 3 marks whereas 11.9 percent scored 3.5 to 5 marks. Only 8 (2.12%) candidates scored full allotted 5 marks.

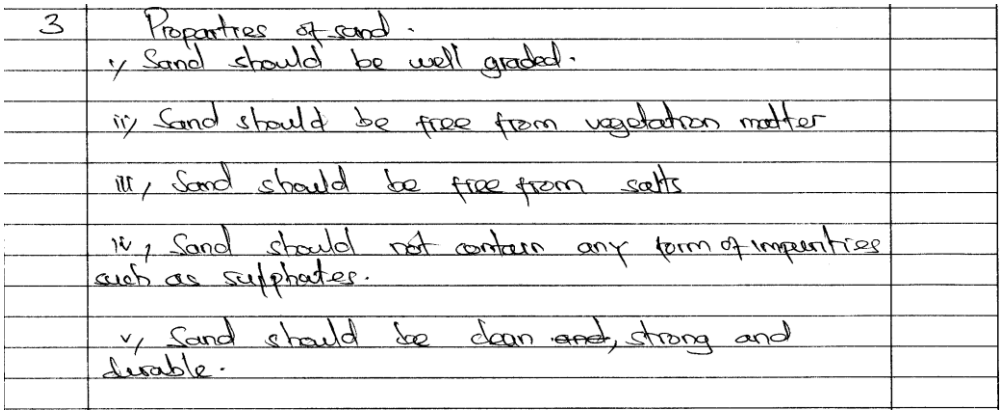
The performance on this question was generally of average as 52 percent of the candidates scored above the pass mark as summarized in Table 4.

Table 4: General Candidates' Performance in Question 3

Scores range (marks)	General Candidates Performance	
	Number	Percentage (%)
0 - 1	181	47.9
1.5 - 3	152	40.2
3.5 - 5	45	11.9
TOTAL	**378**	**100**

The analysis shows that, 52 percent of the candidates scored pass mark and above. These candidates were able to show the properties of sand suitable for

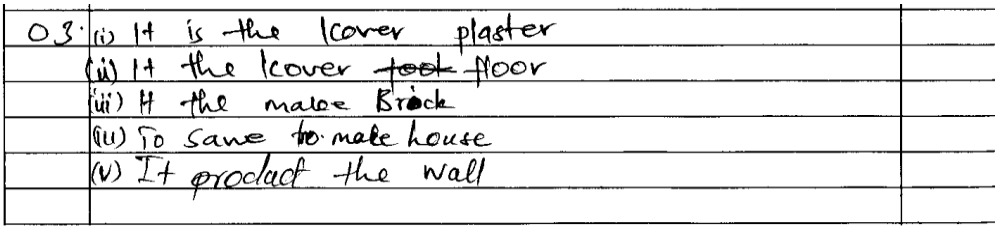
preparation of mortar. Sand is the important ingredient which affects the quality of mortar. Candidates managed to recall correctly all the properties as presented in Extract 3.1.



Extract 3.1: A sample of the candidate's good responses in question 3

Extract 3.1 shows a sample of the response from one of the candidates who was able to show the properties of sand which suitable for preparation of mortar as required through the question task.

Further analysis indicates that, 48 percent of the candidates who scored below pass mark were able either to list only one correct property or failed to list any correct property of sand suitable for mortar preparation. These candidates lacked knowledge on the construction materials specifically for preparation of mortar. Extract 3.2 is a sample of poor response from one of the candidates.



Extract 3.2: A sample of one of the candidates' poor responses in question 3

Extract 3.2 shows the incorrect response from one of the candidates who responded incorrectly to question 3. Such candidate failed to list down four properties of sand suitable for mortar preparation.

2.2.2 Question 4: Wall

The question required the candidates to show how Skirting, Architraves and Cornices differ from each other.

This question was attempted by 243 (62.12%) candidates, whereby 88.1 percent scored 0 - 1 mark out of which 75.3 % scored a 0 mark. The remaining 26 (10.7%) candidates' scored 1.5 to 3 marks. Only 1.2 percent of the candidates scored 3.5 to 5 marks.

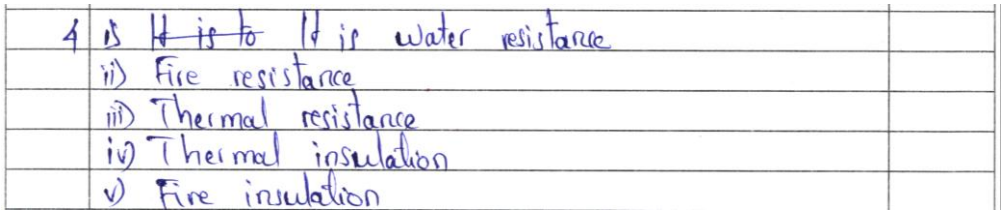
Generally, the candidate's performance on this question was weak as 88.1 percent scored below the pass mark as summarized in Table 5.

Table 5: General Candidates' Performance in Question 4

Scores range (marks)	General Candidates Performance	
	Number	Percentage (%)
0 - 1	214	88.1
1.5 - 3	26	10.7
3.5 - 5	3	1.2
TOTAL	**243**	**100**

As shown in Table 5, majority of the candidates, (88.1 %) failed in this question. The massive failure of the candidates' in this question was due to the fact that terminologies are used in modern building. Skirting boards, architraves and cornices are different, yet they serve the same purpose. They are designed to hide uneven and untidy areas around the floor/wall and door or window space areas. Their difference is based on the area they are placed. For example, skirting is used to hide uneven areas between the floor and wall, architraves between door frame and wall while cornices are placed between wall and ceiling board.

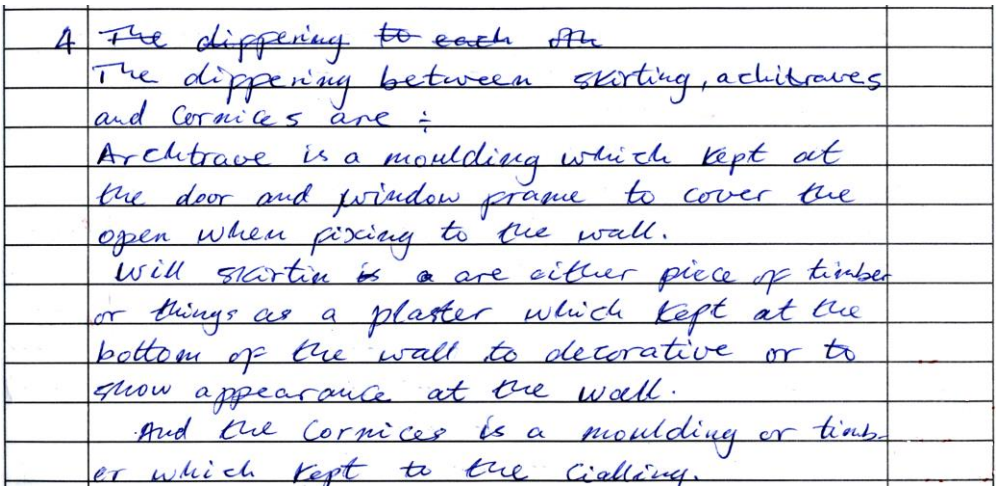
Most of the candidates, 38.88 % skipped this question. Those who attempted it produced irrelevant responses as shown in Extract 4.1.


4 i) ~~It is to~~ It is water resistance
ii) Fire resistance
iii) Thermal resistance
iv) Thermal insulation
v) Fire insulation

Extract 4.1: A sample of one of the candidates' poor responses in question 4

Extract 4.1 shows a sample of response from one of the candidates who failed to show the differences between skirting, architraves and cornices.

Despite the massive failure of the candidates in this question, a few candidates were able to score the pass mark and above. These candidates had enough knowledge of these products and their uses. They produced good responses as depicted in the Extract 4.2.


4 ~~The~~ ~~dippening~~ ~~to~~ ~~each~~ ~~oth~~
The dippening between skirting, architraves and cornices are ÷
~~Ar~~chitrave is a moulding which kept at the door and window frame to cover the open when fixing to the wall.
Will skirtin ~~is~~ a are either piece of timber or things as a plaster which kept at the bottom of the wall to decorative or to show appearance at the wall.
And the cornices is a moulding or timber which kept to the cielling.

Extract 4.2: A sample of one of the candidate's good responses in question 4

Extract 4.2 shows the sample of response from the candidate who was able to shows the differences between skirting, architraves and cornices.

2.2.3 Question 5: Site Preparation

In this question, the candidates were required to list five facilities and services required for a well managed site before starting construction works.

This question was attempted by 385 (98.47%) candidates; whereby 38.7 percent scored 0 to 1 mark out of which 34.3 percent scored a 0 mark. A total number of 37 (9.61%) candidates scored from 1.5 to 3 marks while 51.7 percent of the candidates scored 3.5 to 5 marks. Out of these 37 candidates which is 34.28 percent managed to score 5 marks.

The performance in this question was generally average as only 61.4 percent of the candidates scored above the pass mark. The trend of candidates' performance in this question is summarized in Figure 4.

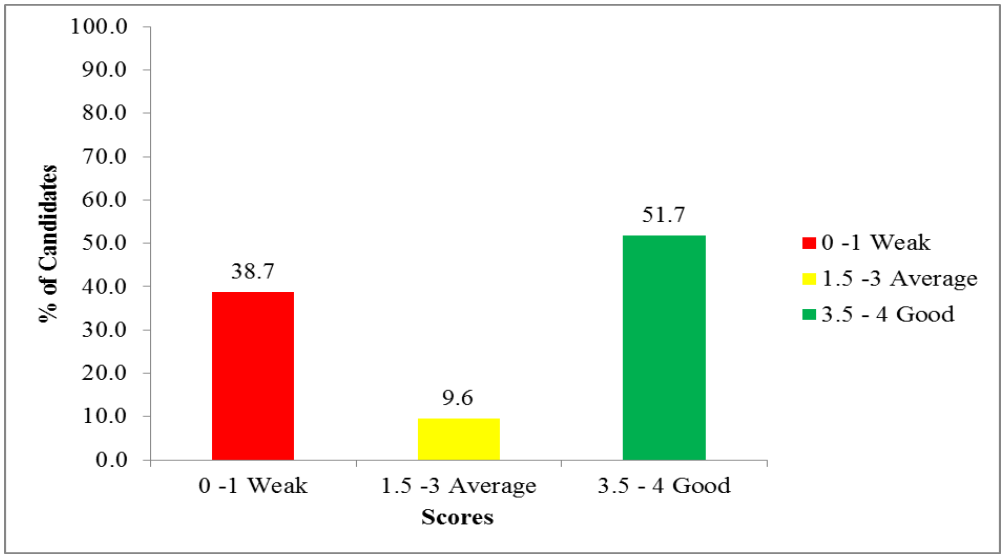
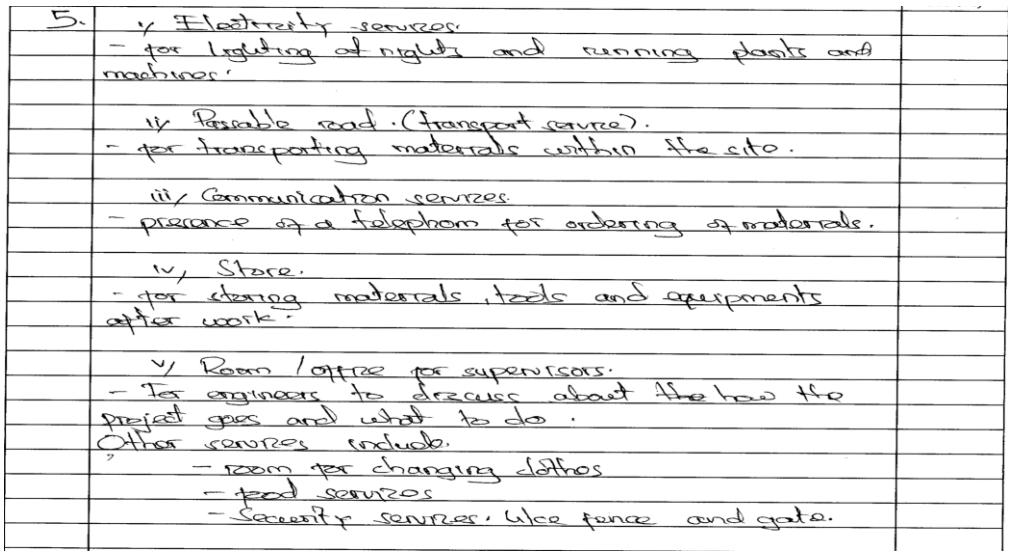


Figure 4: Candidates Performance on Question 5

Figure 4 shows that, most of the candidates (61.3 %) scored above pass marks. These had knowledge regarding the topic of site preparation. They were able to list five facilities and services required for a well-managed site before starting construction works. These candidates were able to recall all activities to be done at a new site before commencement of the work. One of the good responses given by one of the candidates from this group is shown in Extract 5.1.


5.
i/ Electricity services.
- for lighting at nights and running plants and machines.

ii/ Passable road. (Transport service).
- for transporting materials within the site.

iii/ Communication services.
- presence of a telephone for ordering of materials.

iv/ Store.
- for storing materials, tools and equipments after work.

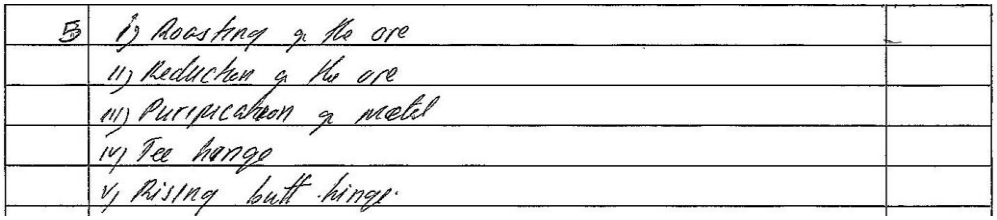
v/ Room / office for supervisors.
- for engineers to discuss about the how the project goes and what to do.

Other services include.
- room for changing clothes
- food services
- Security services, like fence and gate.

Extract 5.1: A sample of one of the candidate's good responses in question 5

Extract 5.1 shows that the candidate was able to list five facilities and services required for a well-managed site before starting any construction works.

Despite the average performance of the candidates, some of them (38.7 %) failed to list the required facilities and services in whereby 34.3 percent could not list any and thus they scored a 0 mark. These candidates lacked knowledge and practical skills on site preparation which led them to fail. Extract 5.2 is the sample of response from one of the candidates who produced poor response.



Extract 5.2: A sample of one of the candidate's poor responses in question 5

Extract 5.2 shows the sample of response from one of the candidates who failed to list five facilities and services required for a well-managed site before starting construction works.

2.2.4 Question 6: Windows

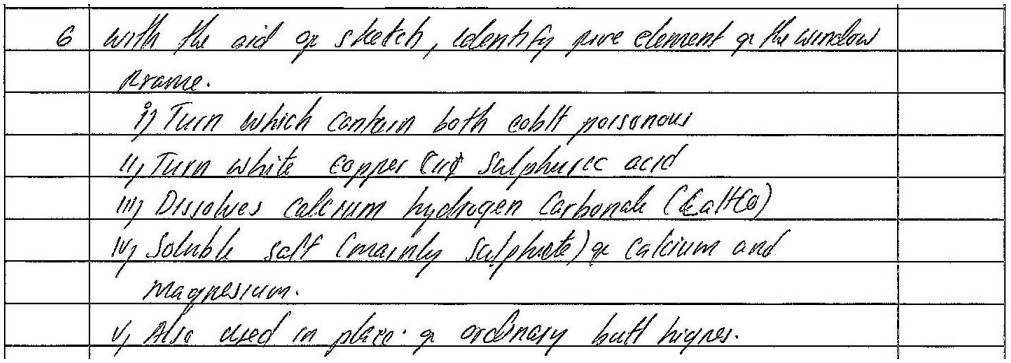
The question required the candidates to identify five elements of window frame with the aid of a sketch. A total of 365 (93.4%) candidates attempted this question, whereby 57.0 percent scored from 0 to 1 mark, from which 47.4 percent scored a 0 mark. Meanwhile, 95 (26 %) scored 1.5 to 3 marks while 17.0 percent of the candidates scored 3.5 to 5 marks out of which 7.7 percent scored all allocated 5 marks to this question.

The performance in this question was generally on average as 43.0 percent of the candidates scored above pass mark. The trend of candidates' performance in this question is summarized in Table 6.

Table 6: General Candidates' Performance in Question 6

Scores range (marks)	Remark	Candidates	
		Number	Percentage (%)
0 - 1	Weak	213	56.2
1.5 - 3	Average	99	26.1
3.5 - 5	Good	67	17.7
TOTAL		379	100

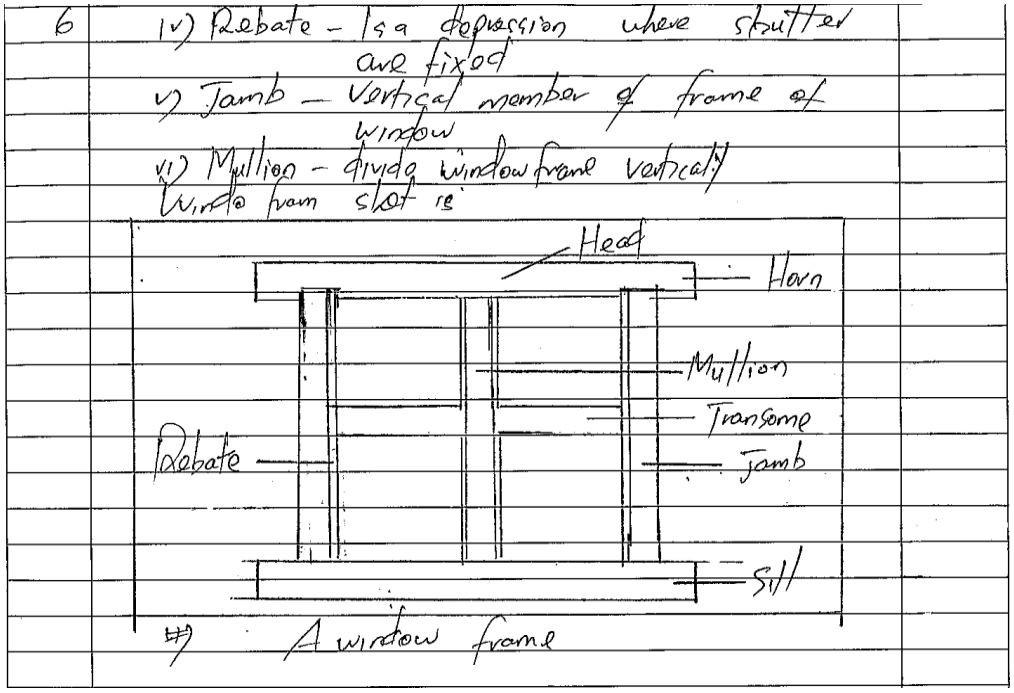
The analysis shows that, 56.2% of the candidates scored below pass mark. These candidates did not understand the need of the question. Some of them confused members with elements of windows. Most of the candidates produced irrelevant responses without any diagrams as per demand of the question. Extract 6.1 illustrate a sample script of one of such candidates.


6 with the aid of sketch, identify five element of the window frame.
i) Turn which contain both cobalt poisonous
ii) Turn white copper (II) Sulphuric acid
iii) Dissolves calcium hydrogen Carbonate ($Ca(HCO_3)_2$)
iv) Soluble salt (mainly Sulphate) of calcium and magnesium.
v) Also used in place of ordinary bath hygnes.

Extract 6.1: A sample of one of the candidates' poor responses on question 6

Extract 6.1 shows the response from one of the candidates who incorrectly identified the elements of the window frame without a sketch.

However, there were some candidates (43.8%) who scored 4 marks. Such candidates managed to identify five elements of window frame with the aid of a sketch as Extract 6.2 shows.



Extract 6.2: A sample of one of the candidate's good responses on question 6

Extract 6.2 shows a sample of candidate script who was able to draw the window and identify five elements of the window frame from the sketch.

2.2.5 Question 7: Floors

The question had two parts (a) and (b). Part (a) required the candidates to explain the use of hard core in construction of solid ground floor. In part (b) the candidates were required to explain two materials that could be used as a replacement of hardcore.

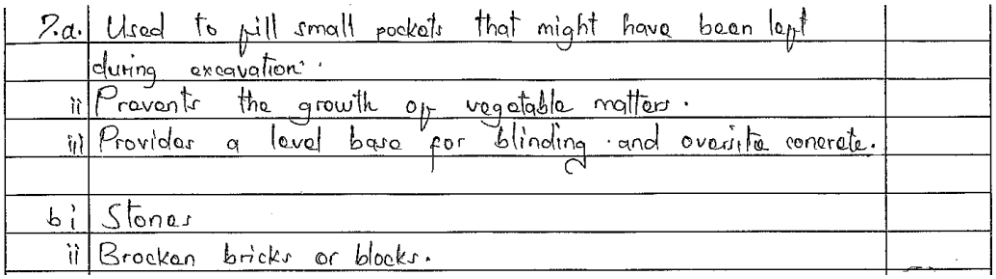
This question was attempted by 378 (96.67 %) candidates out of which 39.7 percent scored 0 to 1 mark of whom 20.4 percent scored a 0 mark out of 5 marks. The candidates who scored 1.5 to 3 marks were 46.4 percent while 14.5 percent scored 3.5 to 5 marks. These were 5.03 percent of candidates who scored full 5 marks.

The performance in this question was generally average as 60.9 percent of the candidates who attempted this question scored above the pass mark. The trend of candidates' performance in this question is summarized in Table 7.

Table 7: General Candidates' Performance in Question 6

Scores range (marks)	Remark	Candidates	
		Number	Percentage (%)
0 - 1	Weak	157	39.1
1.5 - 3	Average	180	46.4
3.5 - 5	Good	57	14.5
TOTAL		394	100

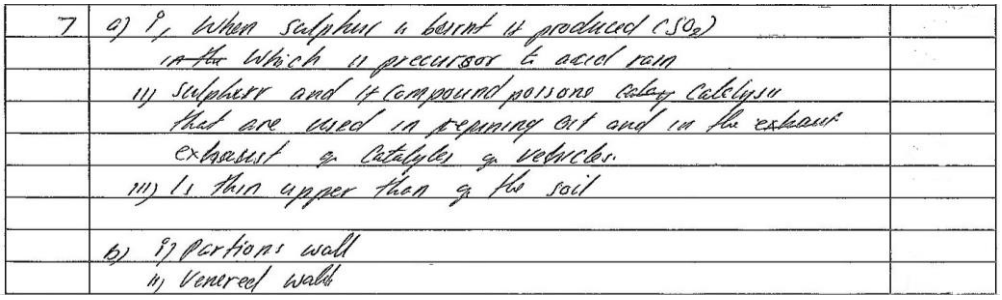
The analysis shows that, majority of the candidates (60.9%) attained the pass mark and above. The candidates managed to explain the use of hard-core in construction of solid ground floor. Also the candidates were able to recommend two materials that could be used as a hard core for building construction. These candidates had enough knowledge regarding solid ground floor construction as they were able to produce relevant responses as demanded by the question. A sample of candidate's good response is shown in Extract 7.1.


2.a. Used to fill small pockets that might have been left during excavation.
ii Prevents the growth of vegetable matters.
iii Provides a level base for blinding and ovesite concrete.
b i Stones
ii Brocken bricks or blocks.

Extract 7.1: A sample of one of the candidate's good responses on question 7

In Extract 7.1 the sampled response shows that the candidate managed to describe the uses of hardcore in construction of solid floor and could correctly recommend the materials that could be used during construction of solid ground floor apart from using hardcore.

Further analysis shows that 39.1 percent of the candidates scored below average in this question. Some of these candidates were able to attempt well in some part of the question but failed the other part. Moreover, some of the candidates scored a 0 mark. Most of the candidates produced irrelevant responses as presented in Extract 7.2.



Extract 7.2: A sample of one of the candidate's poor responses on question 7

Extract 7.2 shows the response from the candidate who failed to describe the uses of hardcore in construction of solid ground floor. Also, the candidate failed to recommend the materials that could be used for constructing of solid ground floor. This candidate explained about the solid ground floor instead of giving the importance of hardcore.

2.2.6 Question 8: Foundation

The question had two parts (a) and (b). Part (a) required the candidates to distinguish between shallow and deep foundation. In part (b) the candidates were required to explain situations where by deep foundation are preferred.

This question was attempted by 374 (95.6%) candidates out of which 39.8 percent scored 0 to 1 mark, 37.7 scored 1.5 to 3 marks while 22.5 percent scored 3.5 to 5 marks. Only 1.8 percent of the candidates were able to score a full mark.

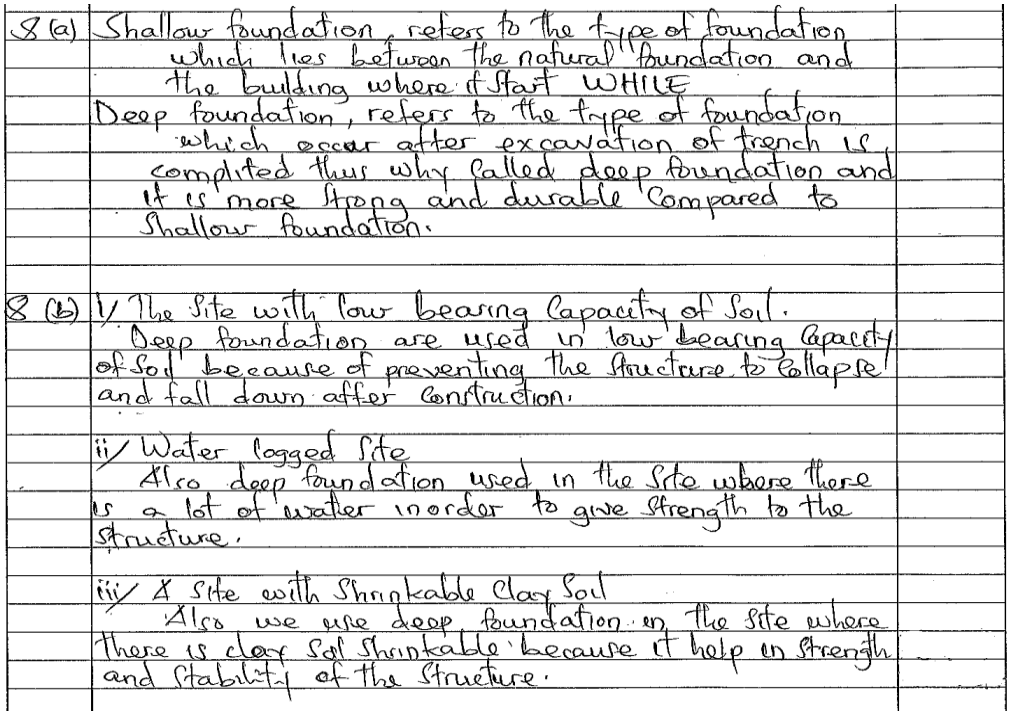
Generally, the performance was of average as 60.2 percent of the candidates who attempted this question scored above the pass mark. The trend of candidates' performance in this question is summarized in Table 8.

Table 8: General Candidates' Performance in Question 8

Scores range (marks)	Remark	Candidates	
		Number	Percentage (%)
0 - 1	Weak	149	39.8
1.5 - 3	Average	141	37.7
3.5 - 5	Good	84	22.5
TOTAL		374	100

Table 8 shows that, 60.2% of the candidates were able to scores pass mark and above in this question. This trend indicates that the candidates had

enough knowledge regarding the underlying or supporting structure of the building (foundation). They managed to differentiate between shallow and deep foundations, and they were able to explain the situations where deep foundations are preferred than other types of foundation (shallow). Extract 8.1 shows one of the good responses.


8 (a) Shallow foundation, refers to the type of foundation which lies between the natural foundation and the building where it start WHILE
Deep foundation, refers to the type of foundation which occur after excavation of trench is complited thus why called deep foundation and it is more strong and durable compared to Shallow foundation.

8 (b) i/ The Site with low bearing Capacity of Soil.
Deep foundation are used in low bearing Capacity of Soil because of preventing the structure to collapse and fall down after construction.

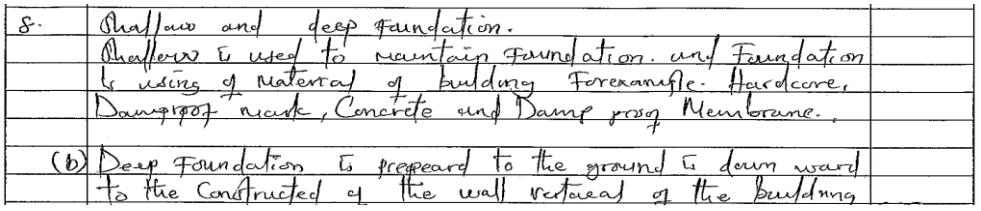
ii/ Water logged Site
Also deep foundation used in the site where there is a lot of water inorder to give strength to the structure.

iii/ A Site with Shrinkable Clay Soil
Also we use deep foundation on the site where there is clay Soil Shrinkable because it help on strength and stability of the structure.

Extract 8.1: A sample of one of the candidates' good responses on question 8

Extract 8.2 shows the sample of one of the response from candidates who were able to distinguish correctly, shallow from deep foundation and to explain the situations where deep foundation is more preferred than other foundation.

On the other hand, 39.8 % of the candidates failed to reach pass mark. Some of these candidates scored below pass mark as most of them produced irrelevant responses in all items. These candidates lacked the knowledge on the tested concepts. Extract 8.2 shows an example of the candidate's irrelevant response.


8. Shallow and deep foundation.
Shallow is used to maintain foundation. and Foundation is using of material of building Forexample. Hardcore, Dampproof mark, Concrete and Damp proof Membrane.

(b) Deep Foundation is prepeard to the ground is down ward to the Constructed of the wall vertical of the building

Extract 8.2: A sample of one of the candidate's poor responses on question 8

Extract 8.2 shows one of the candidates who failed to distinguish shallow from deep foundation and to explain the situations where by deep foundation is more preferred. The candidate wrote about some parts of the foundation or materials used during construction of foundation instead of differentiating shallow foundation from deep.

2.2.7 Question 9: Stair and Stair case

In this question the candidates were required to use the sketch of timber stair to explain how treads and risers are fastened to a housed or closed stringer.

This question was attempted by 362 (92.6%) candidates, whereby 73.8 percent scored 0 to 1 mark out of which, 70.4 percent scored a 0 mark. A total number of 88 (24.3 %) candidates scored 1.5 to 3 marks while only 1.9 percent of the candidates managed to score 3.5 to 5 marks.

Generally, the performance on this question was weak as 73.8 percent of the candidates scored below the pass mark. The trend of candidates' performance on this question is summarized in Figure 5.

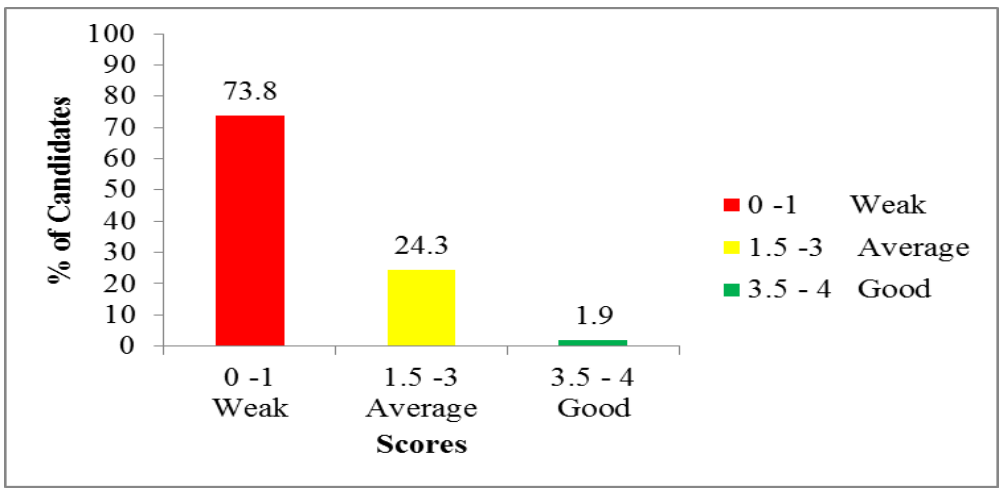
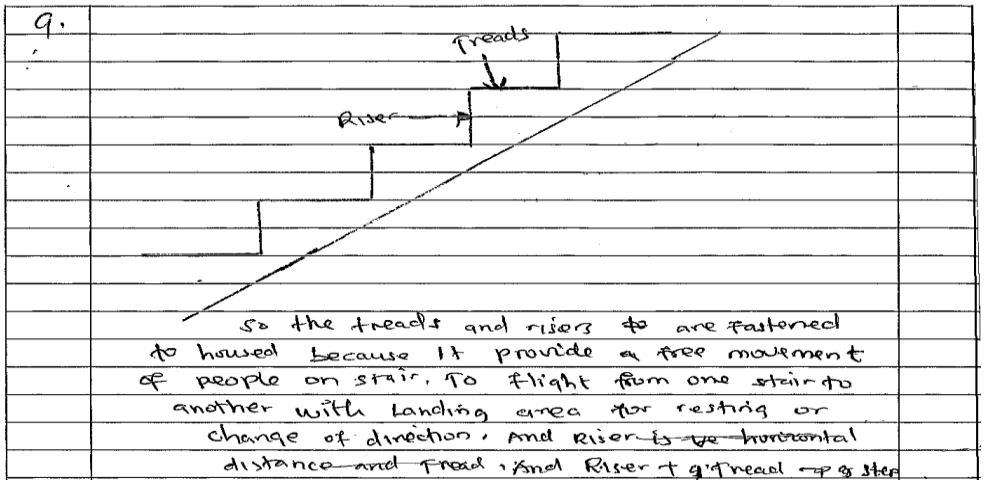


Figure 5: Candidates Performance on Question 9

Figure 5 shows that, majority (73.8%) of the candidates failed to reach pass mark. These candidates failed in either all or some parts of the question by writing irrelevant responses contrary to the demand of the question.

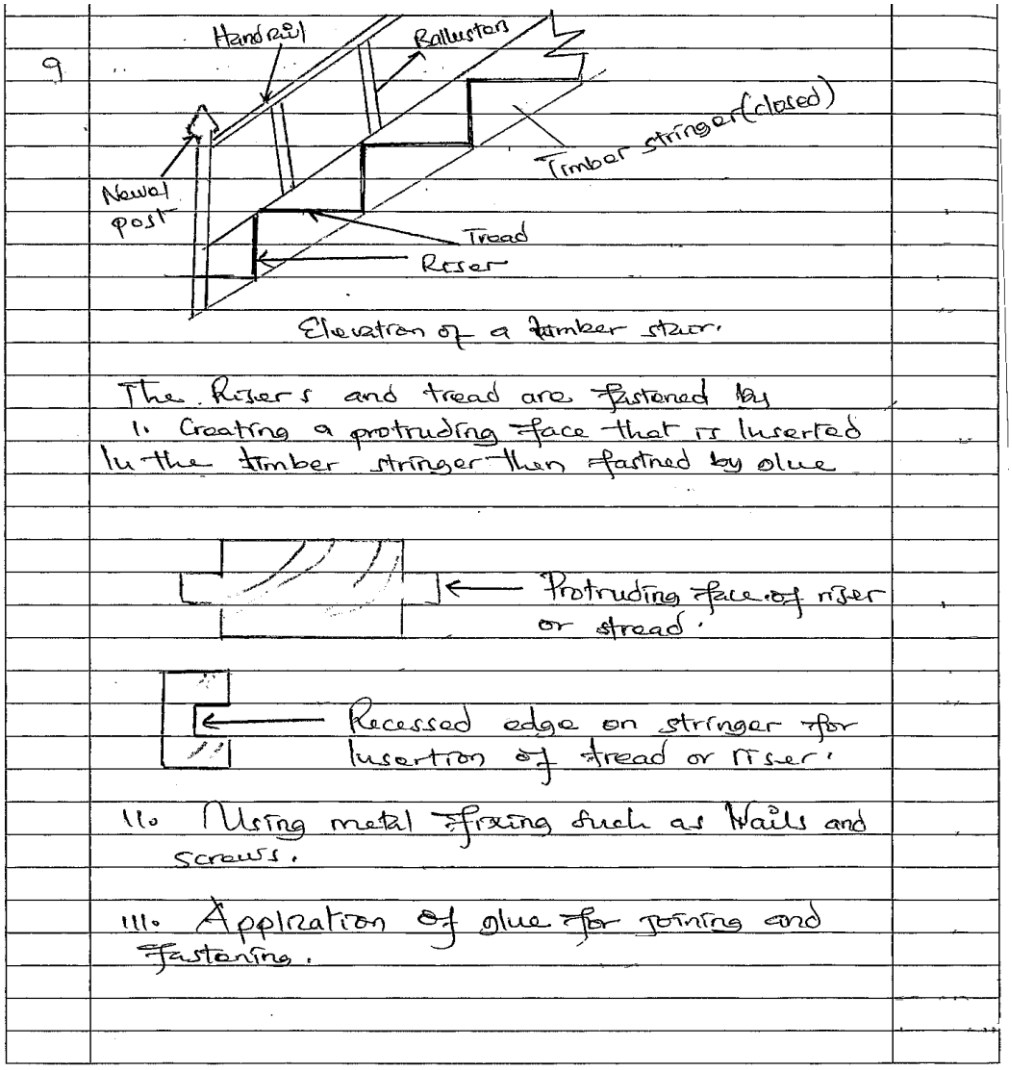
Some of the candidates failed to draw the sketch of timber stair and explain how treads and risers are fastened to a housed or closed stringer due to lack of knowledge on the stairs and staircase. The candidates were more familiar with concrete stairs rather than other type of stairs. Thus, they failed to produce relevant response. Some were able to draw the elevation of the stair but they failed to explain how treads and risers are fastened to a housed or closed stringer as presented in Extract 9.1.



Extract 9.1: A sample of one of the candidate's poor responses on question 9

As Extract 9.1 shows, the candidate failed to explain how treads and risers are fastened to a housed or closed stringer. The candidates sketched the elevation of stair and showed the riser and tread of stair but could not give the details of how the treads risers are fastened.

However, a few candidates 26.2 % were able to answer the question correctly. Thus, they were able to score above pass mark. These candidates had good knowledge on the stairs and staircase. Extract 9.2 shows one of the correct responses on question 9.



Extract 9.2: A sample of one of the candidate's good responses on question 9

Extract 9.2 shows the correct response from one of the candidates who was able to explain how treads and risers are fastened to a housed or closed stringer.

2.2.8 Question 10: Scaffolding and Shoring

The question required the candidate to differentiate shoring from scaffolding as a temporary support.

This question was attempted by 367 (93.9%) candidates; whereby 28.6 percent scored 0 to 1 mark out of which 18.3 percent scored a 0 mark. A total of 148 (40.3%) candidates scored 1.5 to 3 marks while 31.1 percent of the

candidates scored 3.5 to 5 marks out of which 4.6 percent managed score full (5) marks.

The performance in this question was generally good as 71.4 percent of the candidates scored above the pass mark. The trend of candidates' performance in this question is summarized in Figure 6.

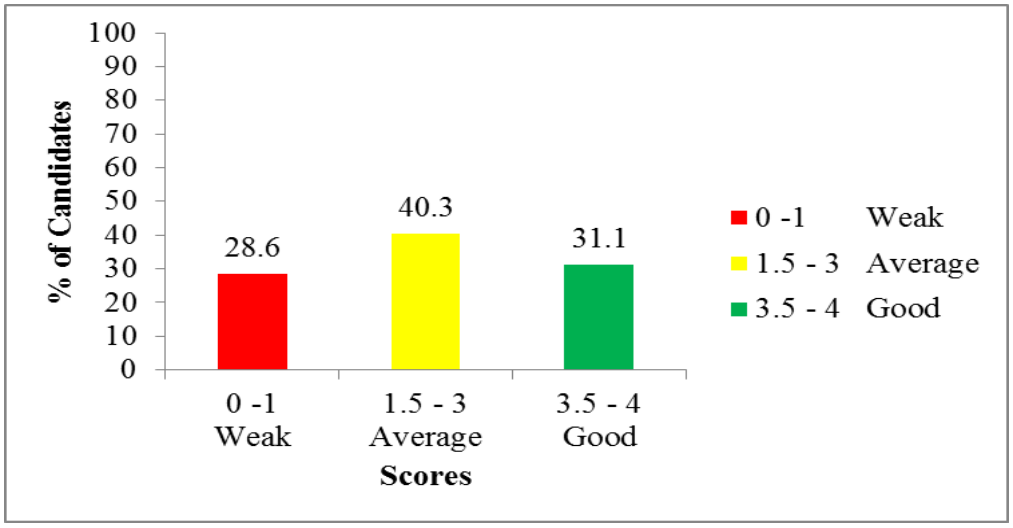
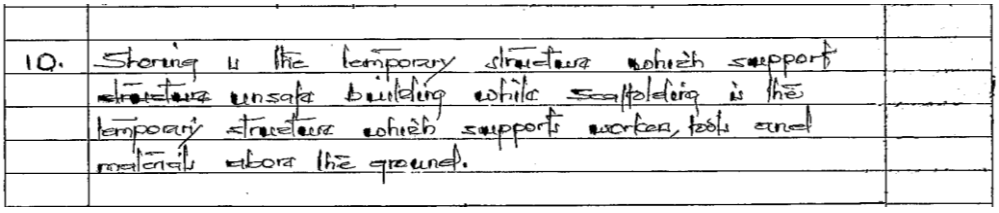


Figure 6: Candidates Performance on Question 10

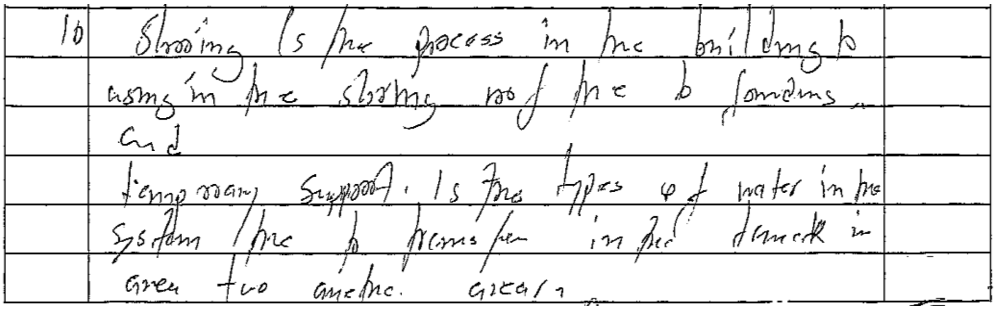
The analysis shows that, majority of the candidates (71.4%) scored pass mark and above. These candidates managed to differentiate shoring from scaffolding as a temporary support. Most of them were able to produce relevant responses by differentiating correctly both structures. These candidates had enough knowledge on the temporary structures used during construction works as the response in Extract 10.1 shows.


10. Shoring is the temporary structure which support structure unsafe building while scaffolding is the temporary structure which supports workers, tools and materials above the ground.

Extract 10.1: A sample of one of the candidate's good responses on question 10

Extract 10.1 shows the sample of good response from one of the candidates who was able to differentiate the two temporary structures correctly.

Despite this performance, 28.6 percent of the candidate scored below the pass mark. These candidates gave inappropriate responses either to all or some parts of the question. Some of the candidates provided incomplete statements. The failure of the candidates in this question was due to lack of knowledge on temporary structures used to support different activities in construction works. Extract 10.2 shows a case where a candidate responded incorrectly.


10 Shoring is the process in the building to using in the shoring of the to formding and temporary support. Is the types of water in the system the to frams for in the damck in area two anothe. area.

Extract 10.2: A sample of one of the candidates' poor responses on question 10

Extract 10.2 shows the response from one of the candidates who failed to differentiate the two temporary structures.

2.3 Section C: Structured Question

This section consisted of four questions, the candidates were required to attempt only three questions. Each question carried 15 marks. The score ranges used for grading performance of the candidates for the questions in this section is indicated in Table 9. The candidates with average to good performance were considered to have passed a particular question.

Table 9: Scores Range for Candidates' Performance in Question 11 - 14

Scores range (marks)	**General Performance**	
	Remark	Grade
0 - 4	Weak	F
4.5 - 9.5	Average	C - D
10 - 15	Good	A - B

2.3.1 Question 11: Drainage

The question had four parts namely; (a), (b), (c) and (d). In part (a) the candidates were required to give three differences between septic tank and cesspool as independent systems for collecting and treating sewage. In part

(b), the candidates were required to list six main places where inspection chambers or manhole should be introduced in the sewerage system. Part (c) required the candidates to identify three main materials which are commonly used for manufacturing of drainage pipes, and part (d) required the candidates to analyze the method used to check if the pipe is clear of obstructions with enough gradients.

This question was attempted by 311 (79.54%) candidates, whereby 55.9 percent scored 0 to 4 marks, 130 (41.9%) candidates scored 4.5 to 9.5 marks and 7 (2.3%) scored 10 to 15 marks.

This performance is generally average as 40.15 percent of the candidates scored above the pass mark. Figure 7 presents the summary of candidates' performance in this question.

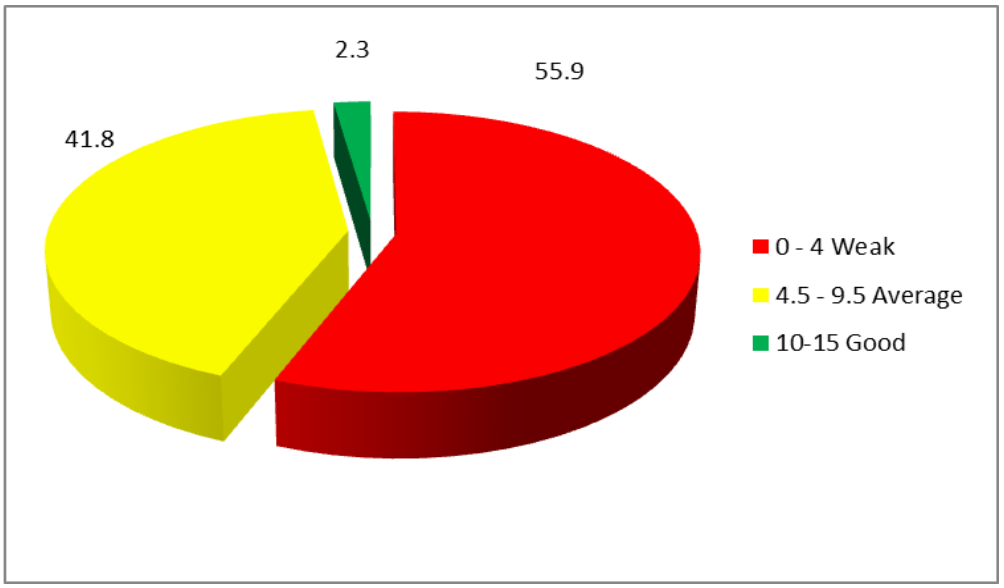
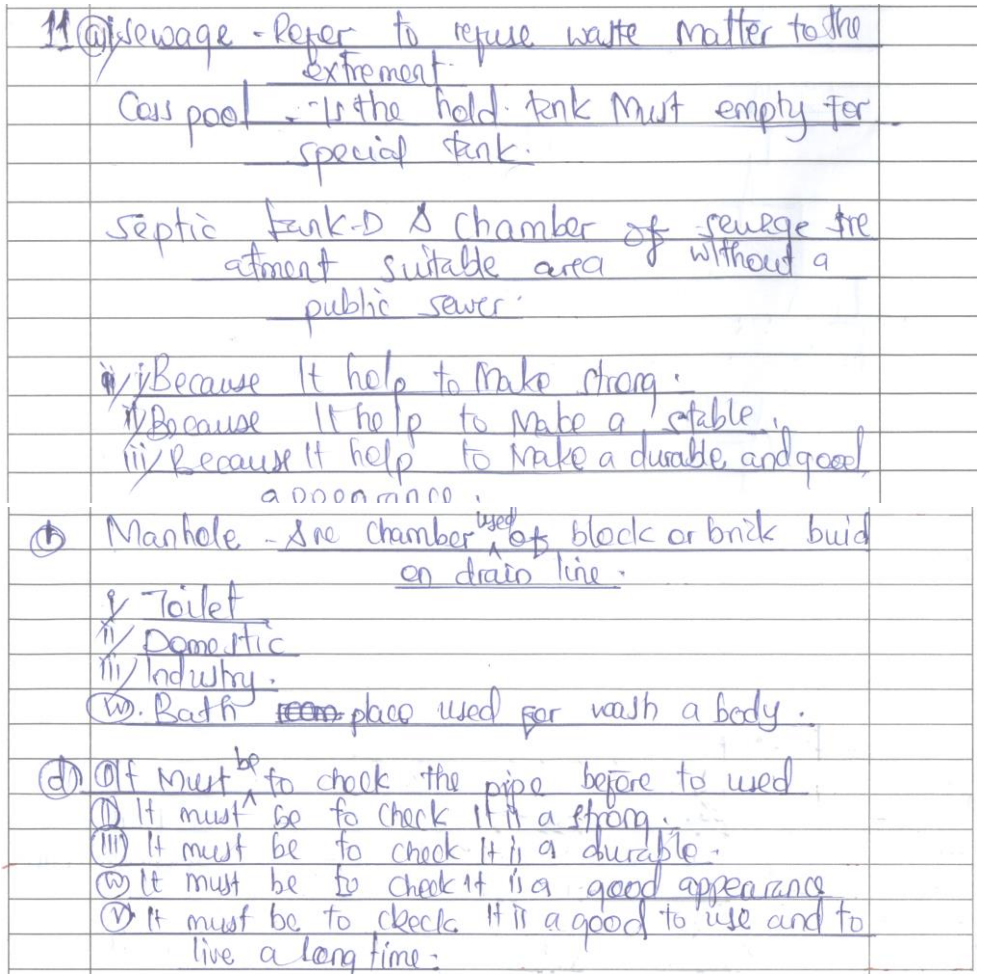


Figure 7: Candidates Performance on Question 11

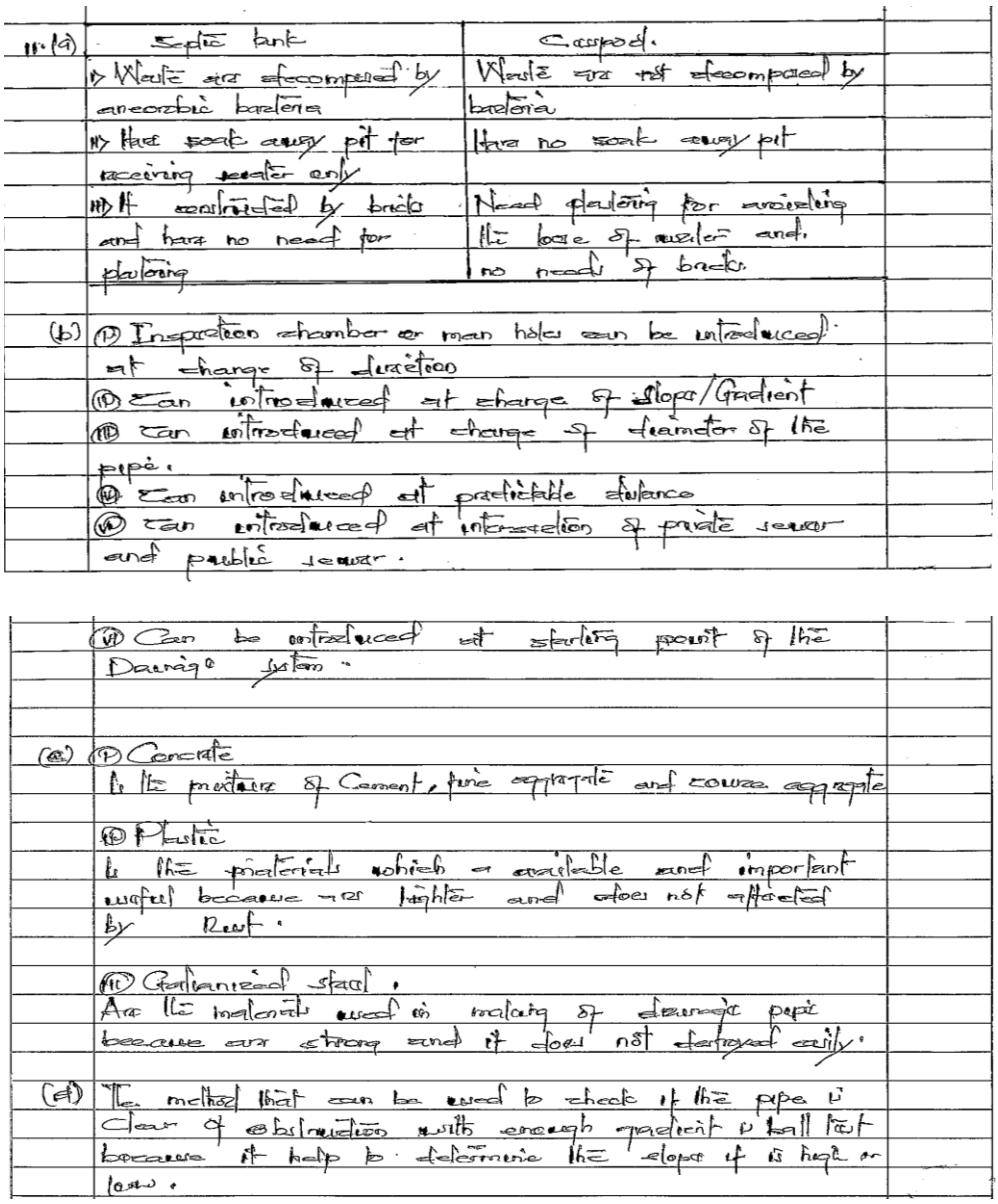
As shown in Figure 7, more than half of the candidates (55.9%) failed as they scored 0 – 4 marks. These candidates lacked knowledge on independent sewage system leading them to lack detail information on this area. They failed to differentiate septic tank from cesspool. Also they failed to show six main places where inspection chambers or manhole should be introduced in the sewerage system. Most of the candidates wrote irrelevant responses in all parts of the question as shown in Extract 11.1.



Extract 12.1: A Sample of one of the Candidate's Poor Responses on Question 11

Extract 11.1 shows one of the responses from the candidate who responded poorly thus scored a 0 mark.

However, the remaining candidates (44.1%) managed to provide good responses in many parts of the question although no one scored full marks. The candidates in this category had better knowledge regarding to the question asked. The sample of candidates' good response is given in Extract 11.2.



Extract 11.2: A sample of one of the candidate's good responses on question 11

Extract 11.2 shows one of the responses from the candidate who correctly explained the concept of independent sewer, positioning and maintenance of water supply system.

2.3.2 Question 12: Floors

This question had three parts (a), (b) and (c). In part (a) the candidates were required to explain four factors that guide the selection of joist size to be used

during construction of timber upper floor. Part (b) required the candidates to use a sketch to give clear information and details on how Corbel brick is constructed and part (c) required the candidate to identify the common joist, trimmer joist, trimming joist, trimmed joist and strutting by using a sketch.

This question was attempted by 122 (31.2%) candidates. A total of 107 (87.7 %) candidates scored 0 to 4 marks out of which 31.1 percent scored a 0 mark. There were 14 (12%) candidates who scored 4.5 to 9.5 marks and 0.3 percent who scored 12 to 15 marks.

Generally, the performance in this question was weak as 87.7 percent of the candidates scored below the pass mark. The trend of candidates' performance in this question is summarized in Table 10.

Table 10: Candidates' Performance on Question 12

Scores range (marks)	**Remark**	**Candidates**	
		Number	Percentage (%)
0 - 4	Weak	107	87.7
4.5 - 9.5	Average	14	12.0
10 - 15	Good	1	0.3
TOTAL		122	100

The analysis shows that, this question was the most skipped question in this paper as only 122 candidates attempted it. Also, the question was poorly performed as 87.7 percent of the candidates scored below the average. These candidates gave irrelevant responses. This depicts that, the candidates did not understand the demand of the question. Most of them tried to differentiate ground floor from other elevated floor such as first floor. They failed to recognize that suspended floor differ from the elevated floor. Extract 12.1 presents the sample of a poor response from one of the candidates.

12 Timber upper floor is the process in subsystem in which the construction in building may to used in measuring in the building and measuring site planning of construction in the finding the floor upper floor the using the the size and ground of function in the building.

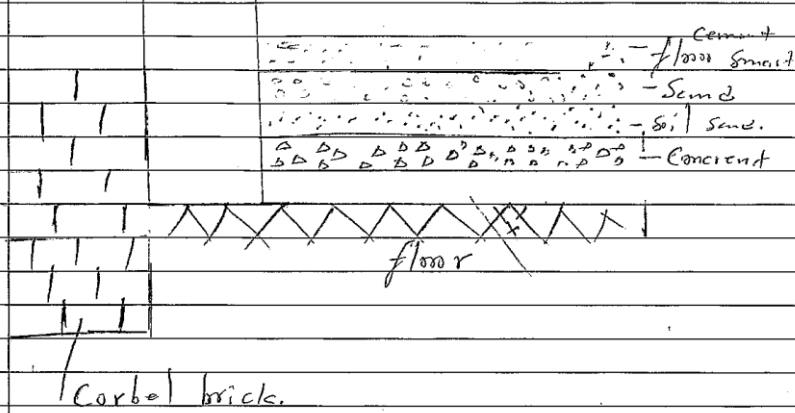
i, To used in the measuring in the building and site framing find for use in the measure area to support in the site in area, for the building house. To support in the see smart building from to see smart building in the harm install house to fit in the construction a timber selection priority, from size the to shape, of building house. x
To proceed in the good appearance in the house building to fit, in the floor, the to maintaining smart house in the down to floor building.

b) (i) Suspended floor
i, to used in the smart building
ii, to used in the shape and size
iii, To smooth in the see slimming house,

c) Corbel brick
i, to used in the building house
ii, to support in the same construction
iii, to support in the line very ~~sea~~ seamless

12

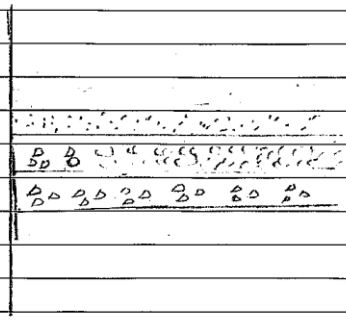
B

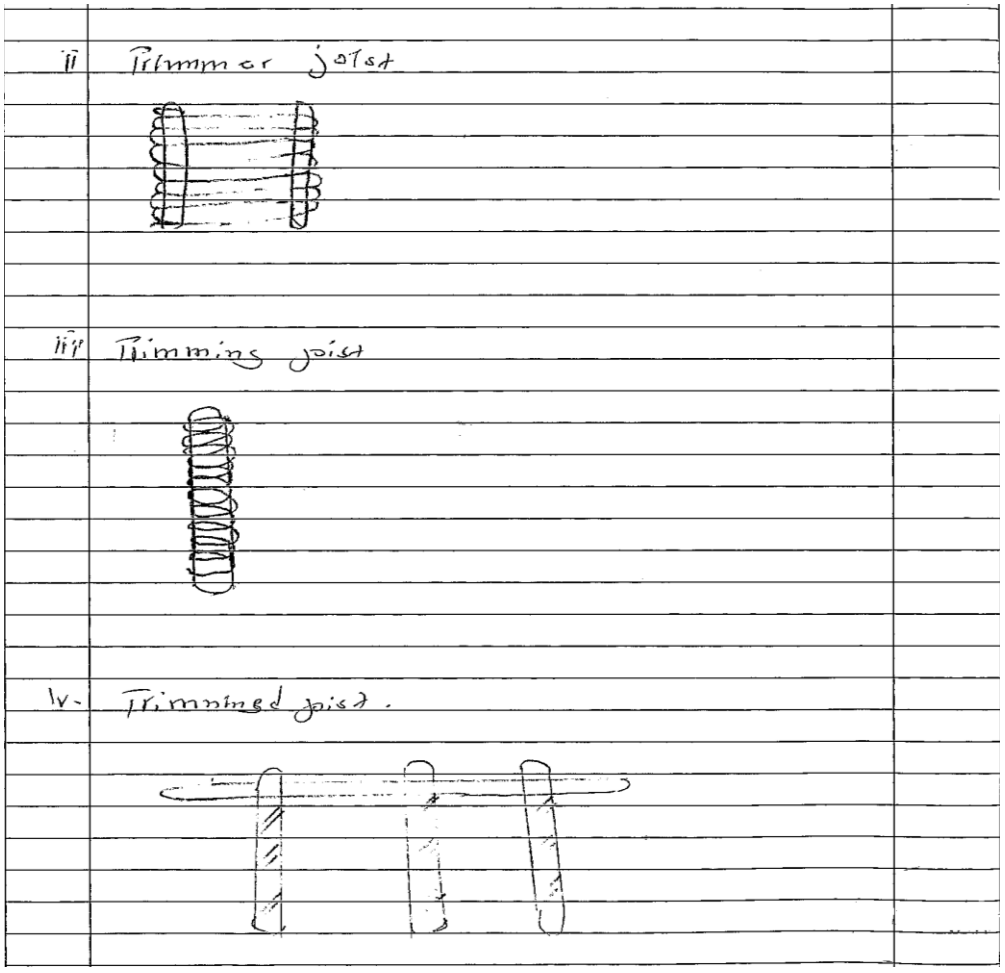


Corbel brick.

C.

1) Common joist

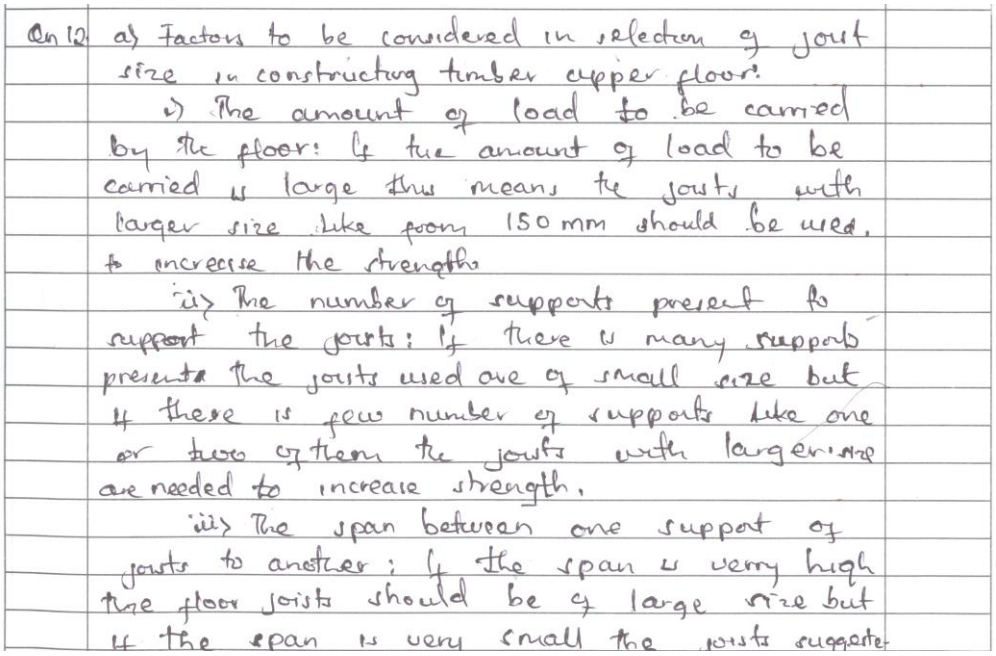




Extract 12.1: A sample of one of the candidate's poor responses on question 12

Extract 12.1 shows a from one of the candidates who failed to list the factors considered in selection of joist size in construction of timber upper floor, construction of corbel brick and to describe different type of joist.

Despite inappropriate responses from majority of the candidates, a few candidates (12.3 %) were able to scores above pass mark. However no one was able to score full allotted marks. These candidates were able to give correct responses in many parts of the question. This implies that, they were aware of the concepts asked. Extract 12.2 is the sample of the candidate response who was able to give the appropriate answers.


Qn 12 a) Factors to be considered in selection of joist size in constructing timber upper floor:
i) The amount of load to be carried by the floor: If the amount of load to be carried is large this means the joists with larger size like from 150 mm should be used, to increase the strength.
ii) The number of supports present to support the joists: If there is many supports presents the joists used are of small size but if these is few number of supports like one or two of them the joists with larger size are needed to increase strength.
iii) The span between one support of joists to another: If the span is very high the floor joists should be of large size but if the span is very small the joists supports

Extract 12.2: A sample of one of the candidate's good responses on question 12

Extract 12.2 shows one of the candidates who was able to list correctly factors considered in selection of joist size in construction of timber upper floor, construction of corbel brick and to describe different type of joist.

2.3.3 Question 13: Foundation

The question had three parts (a), (b) and (c). In part (a) the candidates were required to explain the effects of dampness to the building. In part (b) the candidate were required to explain the differences between damp proof course and damp proof membrane and in part (c) the candidate were required to draw a well labeled diagram which would show how horizontal DPC and vertical DPC are connected with DPM to form damp protection for external wall and floor.

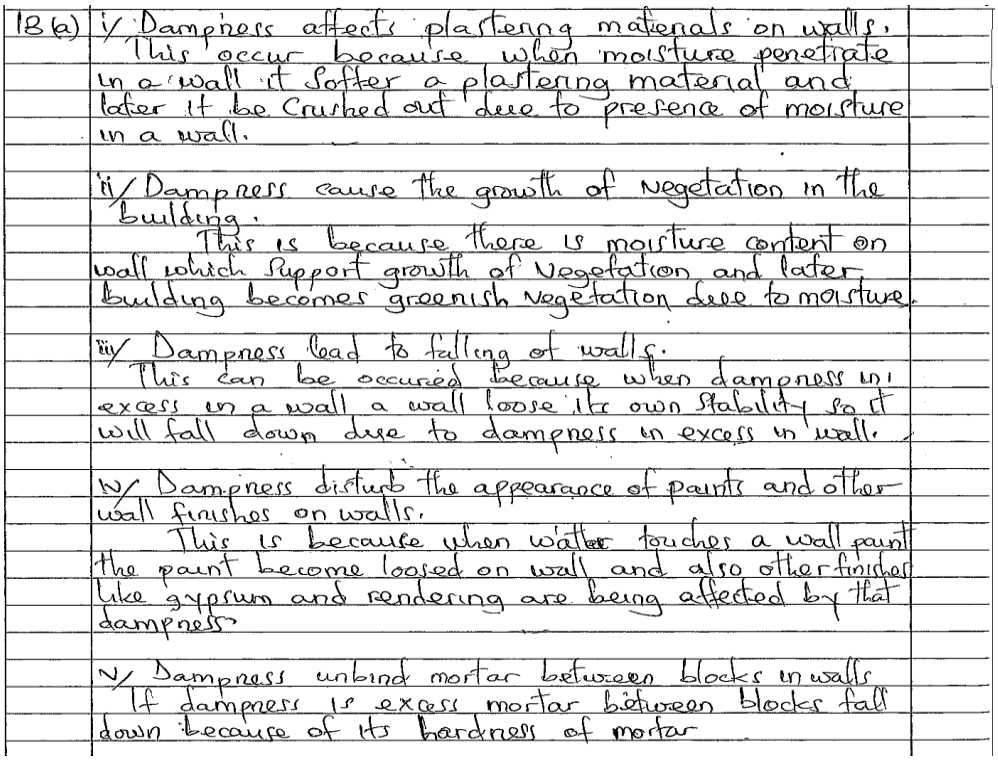
The question was attempted by 355 (90.8%) candidates out of which 48.2 percent scored 0 to 4 marks, 36.3 percent scored 4.5 to 9.5 and only 15.5 percent scored 10 to 15 marks.

Generally, the performance was of average as 51.8 percent of the candidates who attempted this question scored above the pass mark. The trend of candidates' performance in this question is summarized in Table 11.

Table 11: Candidates' Performance on Question 13

Scores range (marks)	Remark	Candidates	
		Number	Percentage (%)
0 - 4	Weak	171	48.2
4.5 - 9.5	Average	129	36.3
10 - 15	Good	55	15.5
TOTAL		355	100

The analysis shows that, 51.8 percent of the candidates scored at and above pass marks. They had adequate knowledge on the concept asked. They were able to provide good response to the questions. They understood that both DPC and DPM perform the same function though are placed at different positions. Also, they knew that DPC and DPM differ by the materials used for manufacturing and they provide prevention of continuous presence of moisture in the wall of floor which may cause efflorescence resulting in disintegration of brick and stone. Extract 13.1 is an example of a correct response from the candidate.



18 (a) i/ Dampness affects plastering materials on walls.
This occur because when moisture penetrate in a wall it softer a plastering material and later it be crushed out dese to presence of moisture in a wall.

ii/ Dampness cause the growth of vegetation in the building.
This is because there is moisture content on wall which support growth of vegetation and later building becomes greenish vegetation dese to moisture.

iii/ Dampness lead to falling of walls.
This can be occured because when dampness in excess in a wall a wall loose its own stability so it will fall down dese to dampness in excess in wall.

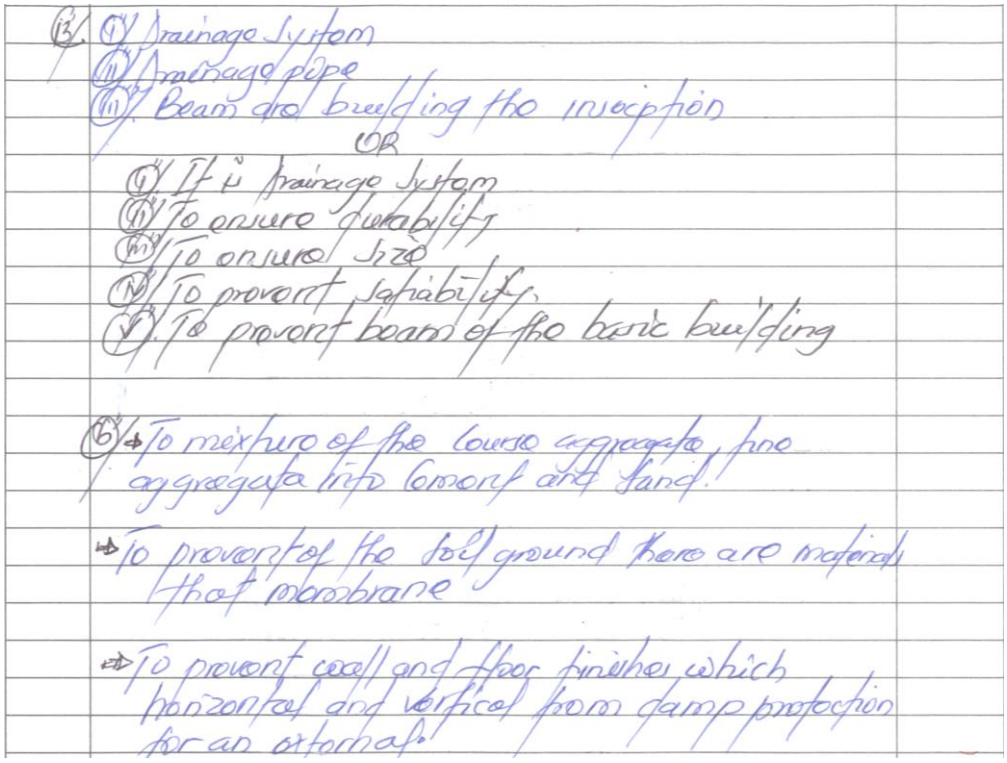
iv/ Dampness disturb the appearance of paints and other wall finishes on walls.
This is because when water touches a wall paint the paint become loosed on wall and also other finishes like gypsum and rendering are being affected by that dampness.

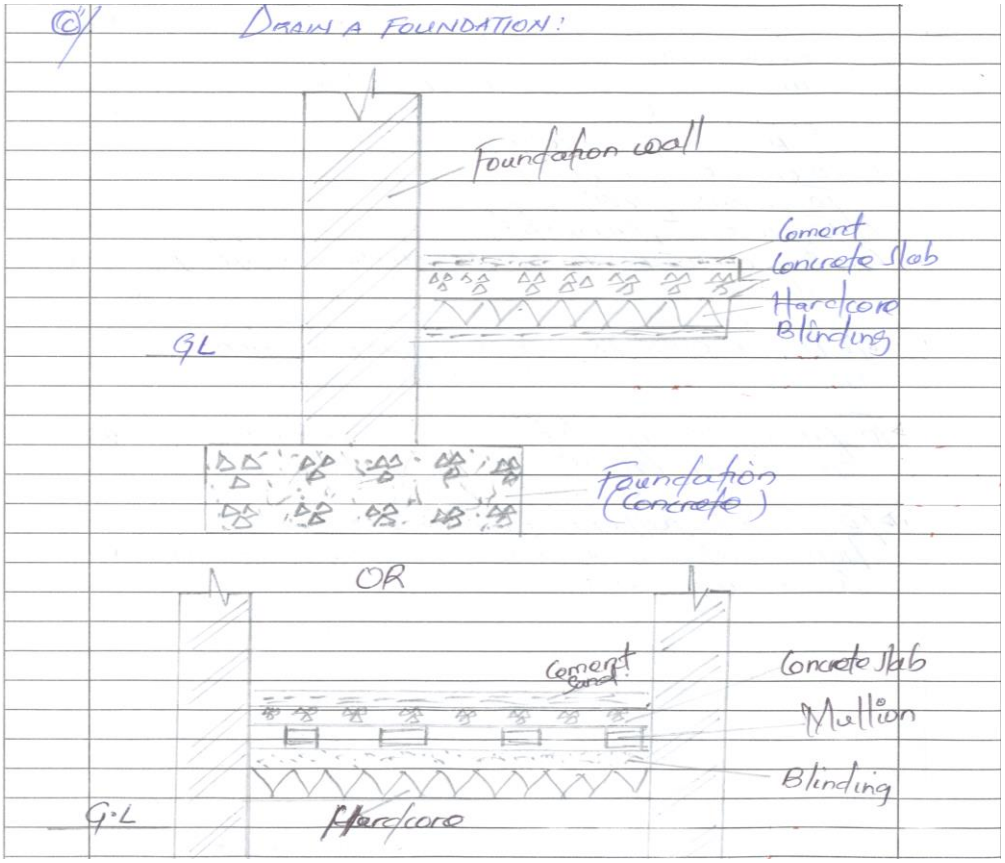
v/ Dampness unbind mortar between blocks in walls
If dampness is excess mortar between blocks fall down because of its hardness of mortar

Extract 13.1: A sample of one of the candidate's good responses on question 13

Extract 13.1 shows a sample of a response from one of the candidates who was able to explain the effects of dampness to the building, differentiate DPM and DPC as well as to show the position of DPM and DPC in foundation correctly.

Despite this performance, 48.2 percent of the candidate scored below the pass mark as they gave inappropriate responses to either all or some parts of the question. The failure of the candidates was due to lack of knowledge on DPC and DPM. Further analysis shows that, some candidates were able to draw the foundation diagram but failed to show how horizontal DPC and vertical DPC are connected with DPM to form damp protection for external wall and floor. Extract 13.2 shows one of the poor responses.





Extract 13.2: A sample of one of the candidate's poor responses on question 13

Extract 13.2 shows a response from one of the candidates who failed to explain the effects of dampness to the building, differentiate DPM and DPC as well as to show the position of DPM and DPC in foundation. The candidates drew the foundation incorrectly.

2.3.4 Question 14: Column and Beams

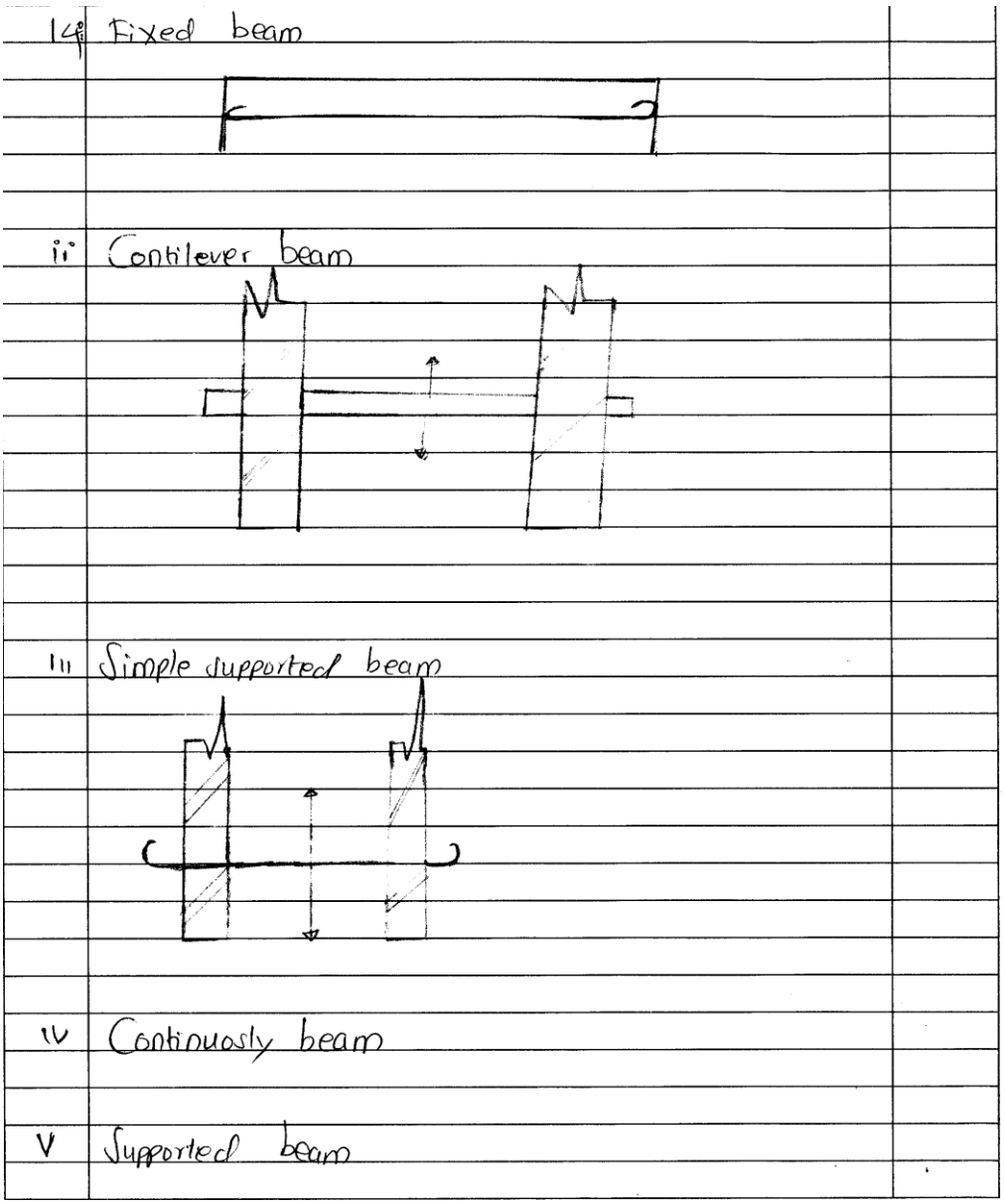
The question required candidates to use diagrams to explain types of beams based on the method of support. Out 274 (70.1%) candidates who attempted this question, 87.1 percent scored 0 to 4 marks out of which, 58.8 percent scored a 0 mark. The rest (12.9%) scored 4.5 to 10 marks. There was no candidate who scored above 10 marks. This was the most poorly performed question in section C.

The trend of candidates' performance in this question is summarized in Table 12.

Table 12: Candidates' Performance in Question 14

Scores range (marks)	Remark	Candidates	
		Number	Percentage (%)
0 - 4	Weak	249	87.1
4.5 - 9.5	Average	37	12.9
10 - 15	Good	0	0
TOTAL		286	100

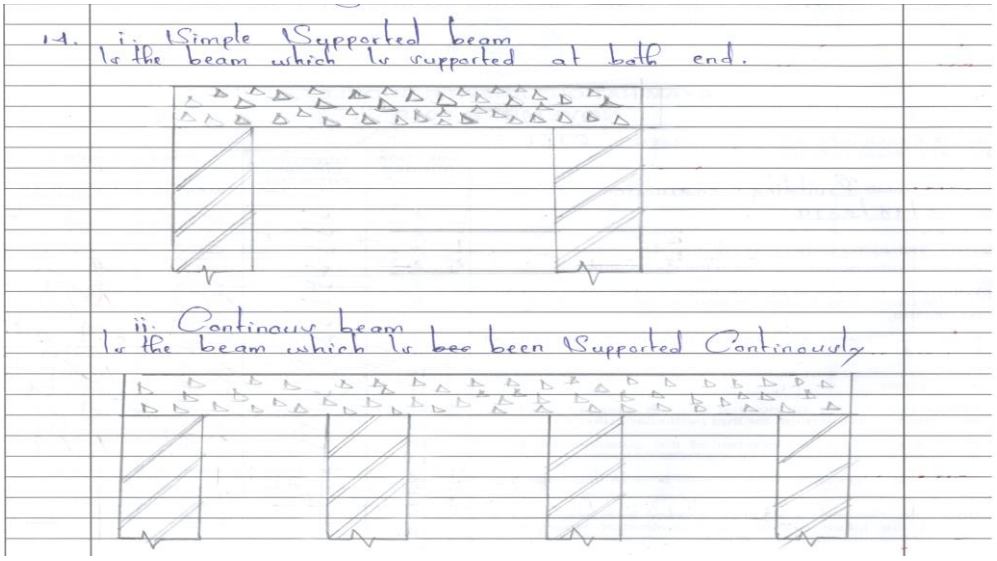
The data in Table 12 shows that, majority of the candidates (87.1%) failed to reach pass mark or above. These candidates failed in either all or some parts of the question by writing irrelevant responses contrary to the demand of the question. The massive failure of the candidates on this question was due to lack of basic knowledge on column and beam. Most of the candidates were able to draw the type of beam which is supported by the column but failed to identify the correct type of beam by name. The types of beams are identified based on the method of support. Also, some candidates failed to draw any type of beam and others drew irrelevant diagrams as Extract 14.1 shows.



Extract 14.1: A sample of one of the candidate's poor responses on question 14.

Extract 14.1 shows a response from one of the candidates who failed to draw the correct types of beams based on method of support.

Although majority of the candidates scored below the pass mark in this question, a few candidates, (12.9%) managed to draw correctly some of the types of beams based on the type of support as presented in Extract 14.2.



Extract 14.2: A sample of one of the candidate's good responses on question 14

Extract 14.2 shows a sample of good response from one of the candidates who was able to draw correctly the types of beams based on the type of support.

3.0 ANALYSIS OF THE CANDIDATES' PERFORMANCE PER TOPIC

The topics covered in Building Construction for CSEE 2019 were: *Site Preparation, Construction Materials (cement, concrete, bricks, stones and timber), Foundation, Walls, Scaffolding and Shoring, Column and Beam, floors, Roof, fire place and flues, Doors and windows, Water Supply, Finishes, Drainage* and *stair and stair case.*

The analysis of the candidates' performance on different topics indicates that 1 out of 14 topics which were tested in Building Construction paper, candidates demonstrated good performance in the topic of *Scaffolding and Shoring* (71.4%). They demonstrated average performance on *Site Preparation* (61.4%), *Floors* (60.9%), *Construction Materials* (60.28%), *Foundation* (52%), *Doors and Windows* (48.9%) *Iron Monger* (43%) and *Drainage* (40.15%). In the topics of *stair and staircase, Column and Beam, Floors* and *Walls* candidates demonstrated poor performance of (26.2%), (12.9%), (12.3%) and (11.9%) respectively.

The candidates' performance per question and per topic is summarized in **Appendix A** and **Appendix B** respectively**.**

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 CONCLUSION

The distribution of candidates' performance is summarized as shown in Figure 1. The general performance in Building Construction subject was generally of average as only 168 (41%) were able to score above the pass mark.

The candidates' performance in question 10 was 'Good' while the performance in questions 1, 2, 3, 4, 5, 6, 7, 8, 11 and 13 was Average. The poorly performed questions were question 9, 12 and 14 from the topic of *Stair and Staircase* (question 9), *Floor* (question 12) and *Column and Beam* (question 14).

Poor performance of the candidates in those questions was due to the failure to understand the demand of the questions, partial attempt of the questions, insufficient knowledge about the topics tested and lack of skills and practical experience.

4.2 RECOMMENDATIONS

Based on the performance observed in this analysis, the following recommendations are worth making for students and teachers.

Recommendations for Students

(a) Students should be encouraged to read carefully the instructions before attempting the questions so as to understand the demand of the questions.

(b) Students are encouraged to search; practice and read relevant books or media in order to widen their knowledge. This will help them to grasp relevant/modern concept/theories applied in building and construction industry.

Recommendations for Teachers

(a) In order to improve candidate's performance, teachers should give enough exercises and tests to their students before they sit for the final examination. This will make them familiar with examination questions and instructions.

(b) Teacher should help students to build practical skills to enable them relate theories and practical, hence acquire the expected competencies.

Appendix A

Analysis of the Candidates' Performance Questionwise

S/N	Topic	Question Number	Percentage of Students who Scored 30% or More	Remarks
1	Scaffolding and shoring	10	71.4	Good
2	Site preparation	5	61.4	Average
3	Floors	7	60.9	Average
4	Construction materials, roofs, wall, windows, doors, water supply, fire place and flues, drainage	1(Multiple Choice Items)	60.36	Average
5	Foundation	8	60.2	Average
6	Construction materials - mortar	3	52	Average
7	Foundation	13	48.9	Average
8	Door and Windows	6	43	Average
9	Door and Windows	2 (Matching Items)	41.64	Average
10	Drainage	11	40.15	Average
11	Stair and stair case	9	26.2	Weak
12	Column and beams	14	12.9	Weak
13	Floor	12	12.3	Weak
14	Wall	4	11.9	Weak

Appendix B

The Candidates' Performance Topicwise

S/N	Topic	Number of Questions	Percentage of Candidates who Scored 30% or More	Remarks
1	Scaffolding and shoring	10	71.4	Good
2	Site preparation	5	61.4	Average
3	Construction materials, roofs, wall, windows, doors, water supply, fire place and flues, drainage	1(Multiple Choice Items)	60.36	Average
4	Foundation	8 & 13	54.55	Average
5	Construction materials - mortar	3	52	Average
6	Door and Windows	2 (Matching Items) & 6	42.32	Average
7	Drainage	11	40.15	Average
8	Floor	7 &12	36.6	Average
9	Stair and stair case	9	26.2	Weak
10	Column and beams	14	12.9	Weak
11	Wall	4	11.9	Weak