Aga Khan University Examination Board

Notes from E-Marking Centre SSC-II Computer Science Annual Examinations 2023

Introduction

This document has been prepared for the teachers and candidates of Secondary School Certificate (SSC) Part II (Class X) Computer Science. It contains comments on candidates' responses to the 2023 SSC-II Examination indicating the quality of the responses and highlighting their relative strengths and weaknesses.

E-Marking Notes

This includes overall comments on candidates' performance on every question and *some* specific examples of candidates' responses which support the mentioned comments. Please note that the descriptive comments represent an overall perception of the better and weaker responses as gathered from the e-marking session. However, the candidates' responses shared in this document represent some specific example(s) of the mentioned comments.

Teachers and candidates should be aware that examiners may ask questions that address the Student Learning Outcomes (SLOs) in a manner that requires candidates to respond by integrating knowledge, understanding and application skills they have developed during the course of study. Candidates are advised to read and comprehend each question carefully before writing the response to fulfil the demand of the question.

Candidates need to be aware that the marks allocated to the questions are related to the answer space provided on the examination paper as a guide to the length of the required response. A longer response will not in itself lead to higher marks. Candidates need to be familiar with the command words in the SLOs which contain terms commonly used in examination questions. However, candidates should also be aware that not all questions will start with or contain one of the command words. Words such as 'how', 'why' or 'what' may also be used.

General Observations

Most candidates achieved success in constructing good responses specifically in the following topics.

- Programming in C
- Fundamentals of Input and Output Handling in C
- Computer Security and Ethics
- Trace Table of Loop Structures
- Algorithms and Flowcharts

Nonetheless, it is essential for teachers to concentrate on the following concepts and provide candidates with more practice to foster a solid understanding.

- Control Structure
- Loop Structure (ERQ)
- Computer Logic and Gates

Note: Candidates' responses shown in this report have not been corrected for grammar, spelling, format, or information.

Detailed Comments

Constructed Response Questions (CRQs)

<table>
<tr><th colspan="2">Question No. 1</th></tr>
<tr><td>Question Text</td><td>Write the name and draw the flowchart symbol in front of each description in the given table.

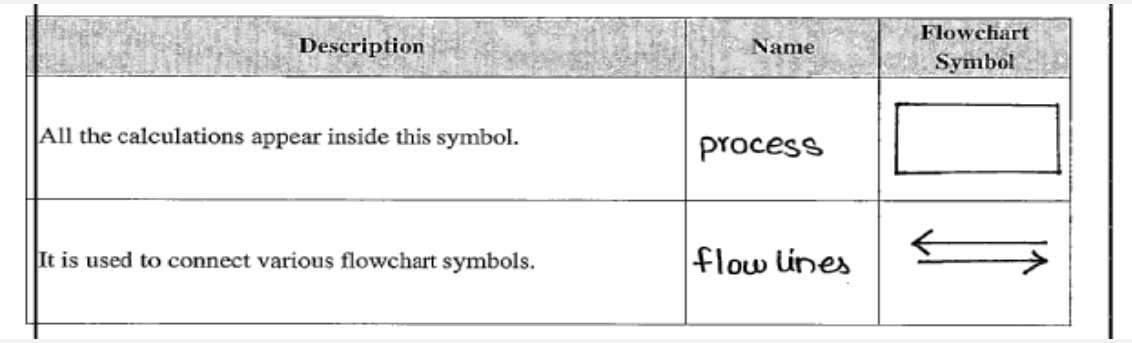
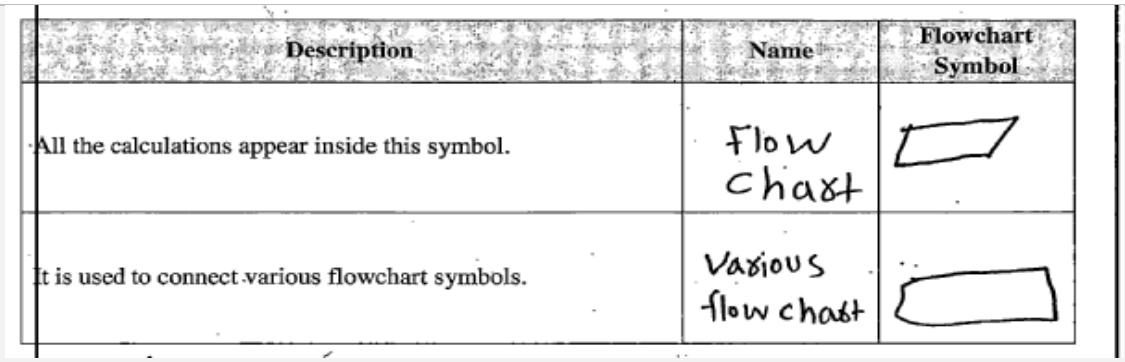
<table>
<tr><th>Description</th><th>Name</th><th>Flowchart Symbol</th></tr>
<tr><td>All the calculations appear inside this symbol.</td><td></td><td></td></tr>
<tr><td>It is used to connect various flowchart symbols.</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>SLO No.</td><td>7.3.3</td></tr>
<tr><td>SLO Text</td><td>Identify the flowchart symbols for the following:
a. input b. process c. decision making d. outputs e. terminator/ terminal point f. connectors.</td></tr>
<tr><td>Max Marks</td><td>2</td></tr>
<tr><td>Cognitive Level</td><td>U*</td></tr>
<tr><td>Checking Hints</td><td>1 mark for each correct identification of name and symbol (TWO required).
1 mark will be awarded if only names are written.
1 mark will be awarded if only symbols are drawn.</td></tr>
<tr><td>Overall Performance</td><td>The overall performance in this question was excellent, Majority candidates demonstrated a clear understanding of the topic and provided correct answers. However, a few responses were inadequate, where candidates were not able to represent the correct symbol against the name and description of flowchart. To improve further, candidates should focus on accurate symbolic representation of a flowchart.</td></tr>
<tr><td>Description of Better Responses</td><td>The candidates' responses to the flowchart question demonstrated an impressive understanding and proficiency in flowchart concepts. The symbols were accurately named, and their symbolic representations were aligned precisely with the given description. This showcased the candidates' strong grasp of the subject matter and their ability to use concepts of flowchart effectively.</td></tr>
<tr><td>Image of Better Response</td><td> 
</td></tr>
<tr><td>Description of Weaker Responses</td><td>The candidates' responses displayed some inaccuracies in the association of different symbols within the flowchart and writing the wrong name against the description like flowchart, arrows, rectangle and various flowchart etc. To improve, the candidates should focus on enhancing their understanding of flowchart concepts and ensuring the accurate use of symbols to represent the logical sequence of steps.</td></tr>
</table>

Image of Weaker Response	

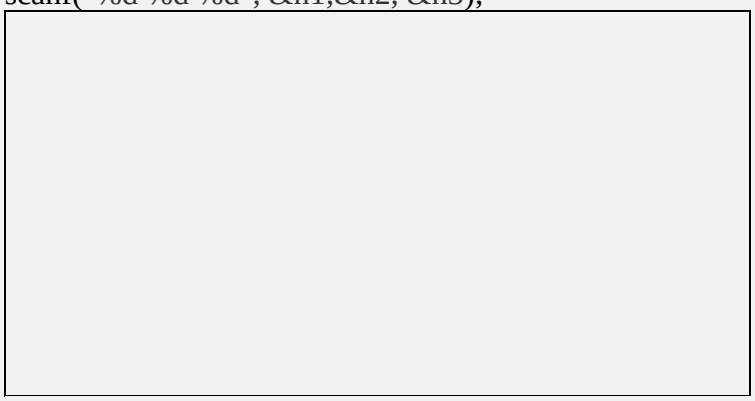
Description	Name	Flowchart Symbol
All the calculations appear inside this symbol.	Flow chart	
It is used to connect various flowchart symbols.	Various flow chart	

Suggestions for improvement (Highlighted part)

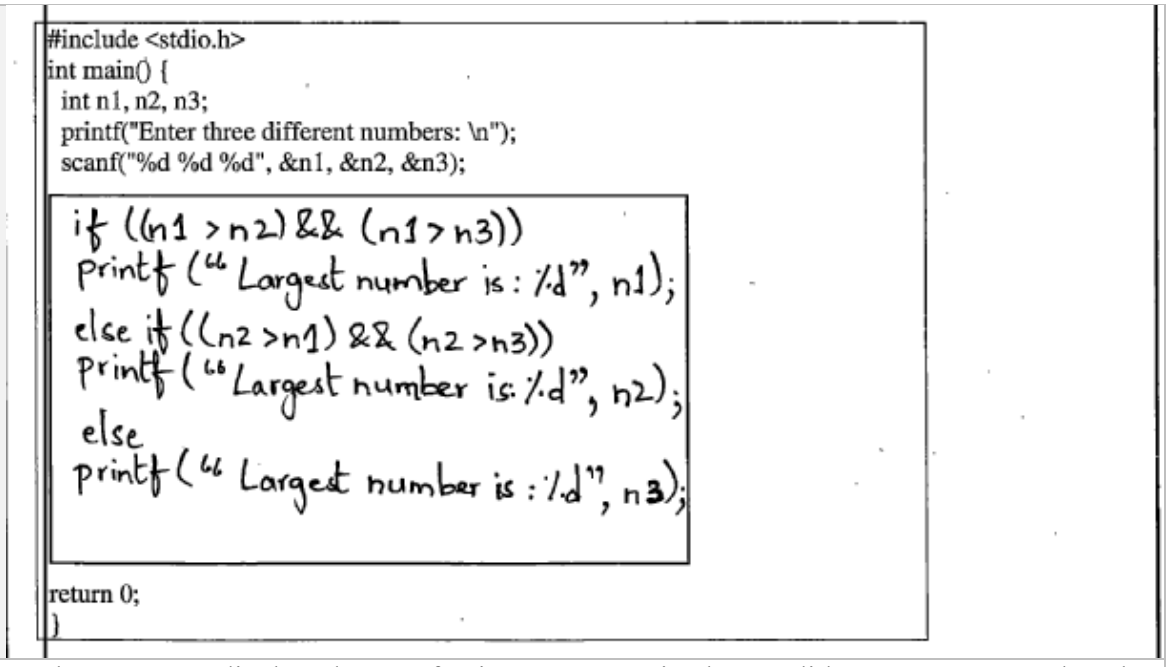
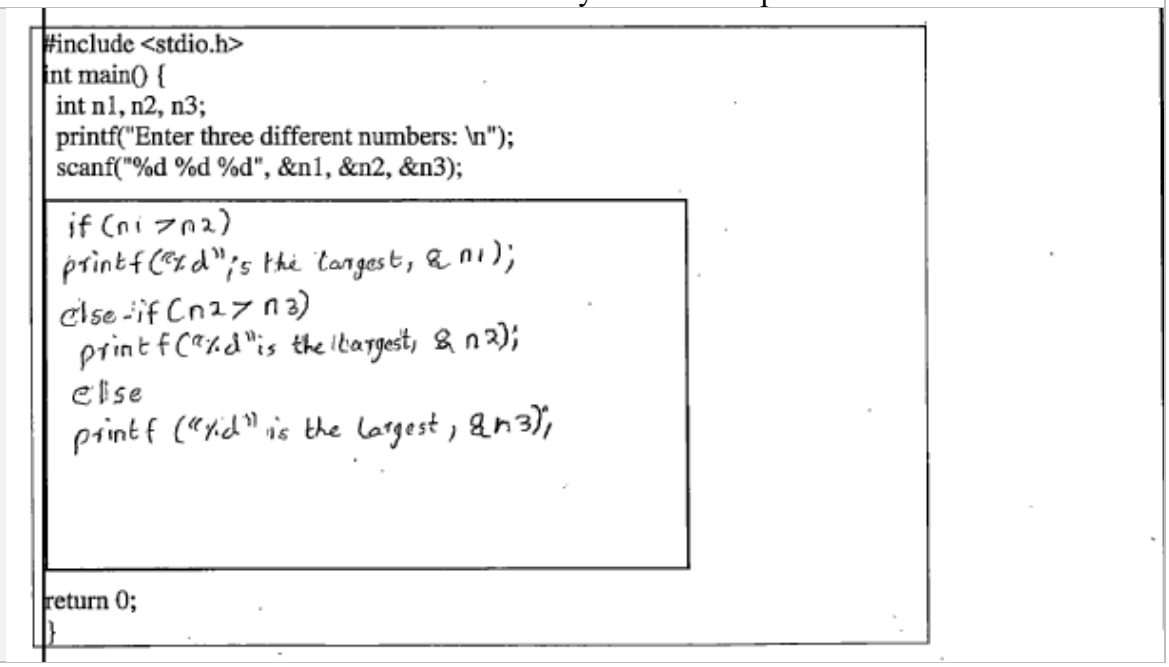
How to Approach SLO	Pedagogy** Used for that SLO	Assessment Strategies
• Understand the expectations of the command words • Look at the cognitive level • Identify the content that is required to answer that question (both in terms of understanding of concepts and any skills that may be required like analysing or evaluating) • Go through the past paper questions on that particular concept • Refer to the resource guide for extra resources	• Story Board • Cause and Effect • Fish and Bone • Concept mapping • Audio Visual resources • Think, pair and share • Questioning Technique (Socratic approach) • Practical Demonstration ** For description of each pedagogy, refer to Annexure A	• Past paper questions • Discussion on E-Marking Notes • AKU-EB Digital Learning Solution powered by Knowledge Platform
Any Additional Suggestion: Teachers are advised to show a practical demonstration of the topic using different mockup tools such as Microsoft visio or balsamiq mockup etc. It will help them to understand the topic in depth.		

*K = Knowledge U = Understanding A = Application and other higher-order cognitive skills

Question No. 2	
Question Text	A C program is written to take three integers with different values as an input and also identify the largest number amongst them. Write the missing code in the given box to achieve the mentioned task.

	#include <stdio.h>
	int main () {
	int n1, n2, n3;
	printf("Enter three different numbers:\n");
	scanf("%d %d %d", &n1,&n2, &n3);
	 
	return 0;
	}

SLO No.	10.1.8
SLO Text	Write C programs for the problems mentioned in 7.2.3 involving the use of if-else-if statement.
Max Marks	3
Cognitive Level	A
Checking Hints	1 mark for writing each correct condition (THREE required).
Overall Performance	The overall performance of the entire cohort in this question was above average. The majority of candidates displayed a strong understanding of programming concepts, showcasing their ability to apply programming logic to construct the missing conditional statements. However, a small number of candidates faced challenges in completing the code, highlighting the importance of reinforcing programming concepts. It is noteworthy that some candidates demonstrated proficiency by effectively utilising if-else-if statements to arrive at correct solutions. To further enhance the cohort's overall performance, encouraging additional practice and providing comprehensive explanations of programming constructs will be invaluable.
Description of Better Responses	Such responses exhibited a high level of competence as the candidates skilfully utilised the if-else-if structure to determine the largest among three numbers. The logical operator used was appropriate in if statements, ensuring the desired output is achieved upon implementing this program. The candidates demonstrated a strong grasp of programming concepts and effectively applied them to solve the problem.

Image of Better Response	
Description of Weaker Responses	Such responses displayed areas for improvement in the candidates' program code. The absence of operators in the conditional statements resulted in the program's inability to evaluate the given conditions accurately, leading to incorrect outcomes. To enhance the code's effectiveness, the candidate should ensure that appropriate logical operators are used in the conditional statements to correctly assess the input values.
Image of Weaker Response	

Suggestions for improvement (Highlighted part)

How to Approach SLO	Pedagogy Used for that SLO	Assessment Strategies
• Understand the expectations of the command words • Look at the cognitive level • Identify the content that is required to answer that question (both in terms of understanding of concepts and any skills that may be	• Story Board • Cause and Effect • Fish and Bone • Concept mapping • Audio Visual resources • Think, pair and share	• Past paper questions • Discussion on E-Marking Notes • AKU-EB Digital Learning Solution powered by Knowledge Platform

required like analysing or evaluating) • Go through the past paper questions on that particular concept • xRefer to the resource guide for extra resources	• Questioning Technique (Socratic approach) • Practical Demonstration	

Any Additional Suggestion:
Teachers are advised to give more practice programs to the candidates specifically on real-life scenarios for better understanding of the conditional statements.

Question No. 3

Question Text

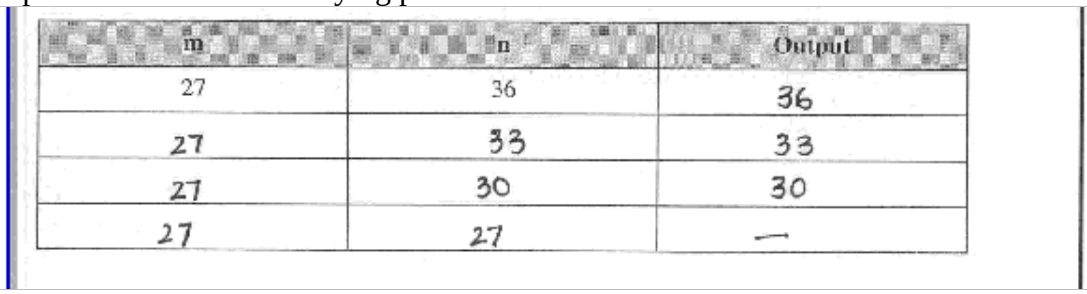
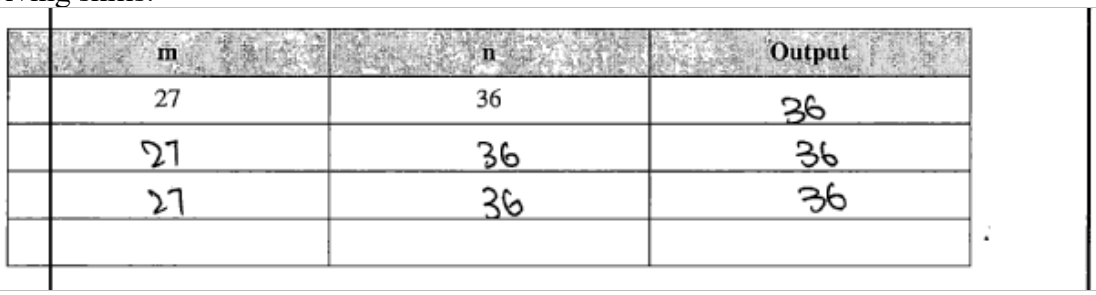
Consider the following C program.

```
#include <stdio.h>
int main() {
int m=27;
int n=36;
 do
   {
    printf("\n%d", n);
    n-=3;
   }
    while (m<n);
 return 0;
}
```

Complete the trace table for the given program.

m	n	Output
27	36	

SLO No.	11.1.7
SLO Text	Write C programs for the problems mentioned in 7.2.3 involving use of do while loop.
Max Marks	3
Cognitive Level	A
Checking Hints	1 mark for writing correct value of n and output of each iteration. (THREE required) No marks will be awarded if either n or output is missing
Overall Performance	The majority of the cohort attempted this question, and their performance was very good. Many candidates exhibited a clear understanding of the programming concepts, resulting in a significant number of them earning full marks. However, a few candidates faced challenges, primarily due to limited exposure to programming and trace tables. Encouraging these candidates to practice more with a compiler and utilise trace tables will be beneficial in enhancing their understanding and strengthening their programming skills.

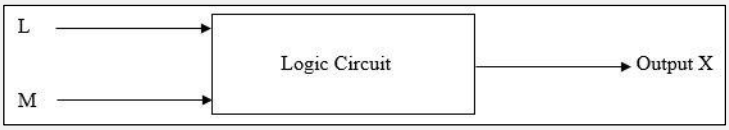
Description of Better Responses	Some candidates' responses were exemplary as they efficiently populated the trace table with accurate values derived from executing the correct program. The calculated values in the "n" column aligned precisely with the expected output. Moreover, the candidates demonstrated proficiency in completing the remaining columns, showcasing a strong comprehension of the underlying process.
Image of Better Response	
Description of Weaker Responses	Such responses demonstrated inaccuracies in the execution, leading to incorrect values in the trace table. A common misunderstanding was that of the loop counter and the number of iterations in the do-while loop. To enhance their understanding, the candidates should revisit the topic, focusing on the loop structure and its control flow. Encouraging the candidates to practice more with trace tables and carefully analysing the code execution will aid in grasping the concept effectively. Additionally, providing guidance through examples and additional exercises can strengthen their comprehension and problem-solving skills.
Image of Weaker Response	

Suggestions for improvement (Highlighted part)

How to Approach SLO	Pedagogy Used for that SLO	Assessment Strategies
• Understand the expectations of the command words • Look at the cognitive level • Identify the content that is required to answer that question (both in terms of understanding of concepts and any skills that may be required like analysing or evaluating) • Go through the past paper questions on that particular concept • Refer to the resource guide for extra resources	• Story Board • Cause and Effect • Fish and Bone • Concept mapping • Audio Visual resources • Think, pair and share • Knowledge Platform videos • Questioning Technique (Socratic approach) • Practical Demonstration	• Past paper questions • Discussion on E-Marking Notes • AKU-EB Digital Learning Solution powered by Knowledge Platform

Any Additional Suggestion:
Teachers are advised to give more practice programs to the candidates for better understanding of the loop structures. Teachers can use different weblinks such as https://www.101computing.net/using-trace-tables/

<table>
<tr><th colspan="2">Question No. 4</th></tr>
<tr><td>Question Text</td><td>Two switches, L and M, send values of 0 and 1 to a logic circuit respectively. Value X is the output of the logic circuit.

Output X has a value of 1 with the following conditions:

Switch L sends value 1 AND switch M sends value 0

OR

Switch L sends value 0 AND switch M sends value 0

OR

Switch L sends value 1 AND switch M sends value 1

i. Draw the logic circuit to represent the given conditions.
ii. Complete the truth table for the logic circuit drawn in part i.
(Note: Show your working in the given working space. Without working NO mark will be awarded.)

<table>
<tr><th>L</th><th>M</th><th>Working Space</th><th>X</th></tr>
<tr><td>0</td><td>0</td><td></td><td></td></tr>
<tr><td>0</td><td>1</td><td></td><td></td></tr>
<tr><td>1</td><td>0</td><td></td><td></td></tr>
<tr><td>1</td><td>1</td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>SLO No.</td><td>12.2.6</td></tr>
<tr><td>SLO Text</td><td>Construct truth table for logic circuits.
Construct logic circuit to solve a given real life problem.</td></tr>
<tr><td>Max Marks</td><td>5</td></tr>
<tr><td>Cognitive Level</td><td>A</td></tr>
<tr><td>Checking Hints</td><td>i. 1 mark for correctly placing NOT gates
1 mark for correctly placing OR gates
1 mark for correctly placing any AND gates
ii. 1 mark for writing either both pairs of working space and value of X for TWO or attempting either working space or value of X for any TWO values.
1 mark will be awarded if only the values of X are written or only the working is shown.</td></tr>
<tr><td>Overall Performance</td><td>The responses to this question indicated that a considerable number of candidates faced challenges in understanding logic circuits. Many inaccurately shaped the gates and depicted incorrect connections in their diagrams. Furthermore, a significant portion of candidates did not complete the truth table, leading to incorrect outputs. Considering the inclusion of a similar practice question in the model paper, it is evident that reinforcing the concepts of logic circuits is essential. Encouraging candidates to practice more with different circuit configurations, providing step-by-step explanations, and offering</td></tr>
</table>

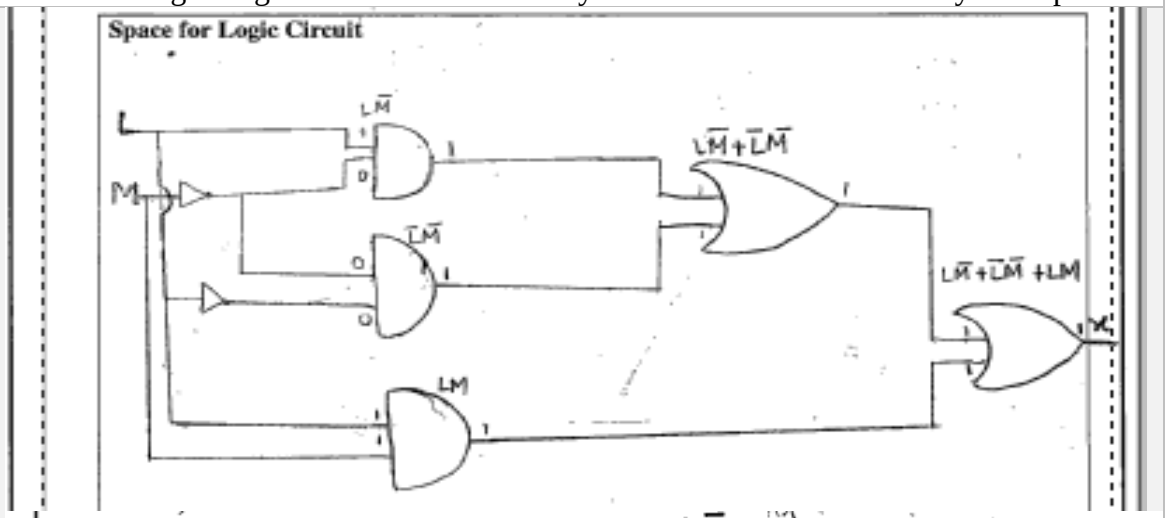
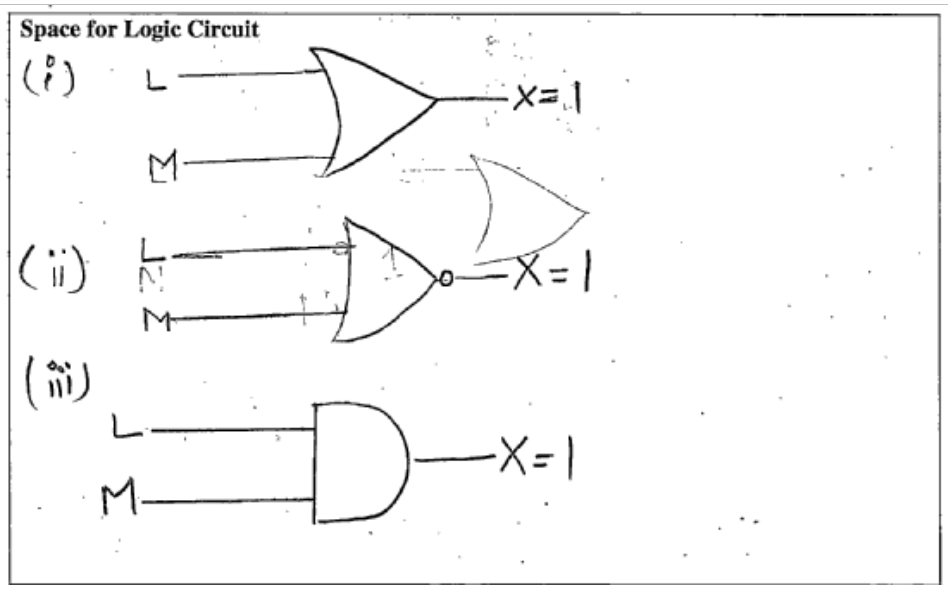
	additional resources can greatly assist in improving their understanding and performance in this area.
Description of Better Responses	In better responses, the candidates accurately depicted the symbols of gates, ensuring their correct representation. The flow of the logic circuit was accurately shown, demonstrating a clear understanding of how inputs and outputs are connected. Moreover, the candidates effectively demonstrated the working of the truth table, providing step-by-step calculations to arrive at the correct output. Overall, better responses showcased a strong understanding of logic circuits and effectively communicated the necessary concepts.
Image of Better Response	 $L\bar{M}$ L M $\bar{L}$ $\bar{M}$ Working Space $\bar{L}\,\bar{M}$ LM X 0 0 1 1 0 1 0 1 0 1 1 0 0 0 0 0 1 0 0 1 1 0 0 1 1 1 0 0 0 0 1 1
Description of Weaker Responses	Weaker responses demonstrated various shortcomings. Many candidates used incorrect symbols in the circuit diagram, leading to inaccurate representation. Lack of proper connection between the gates indicated misunderstanding of how inputs and outputs should be linked. Additionally, the truth table lacked to show working or calculations, which resulted in an incorrect output. Such deficiencies highlighted a need to effectively understand logic circuits and effectively communicate the concepts.

Image of Weaker Response



L	M	Working Space	X
0	0	LM=0 , L+M=0	0
0	1	LM=0, L+M=1	1
1	0	LM=0, L+M=1	1
1	1	LM=1, L+M=1	1

Suggestions for improvement (Highlighted part)

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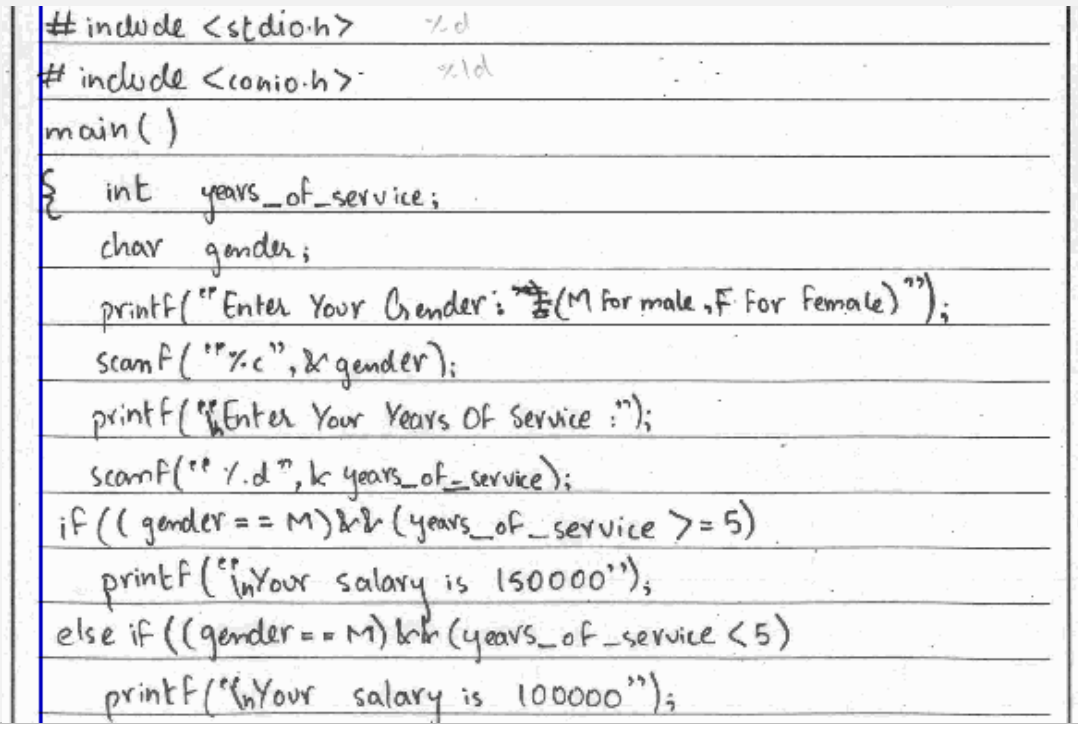
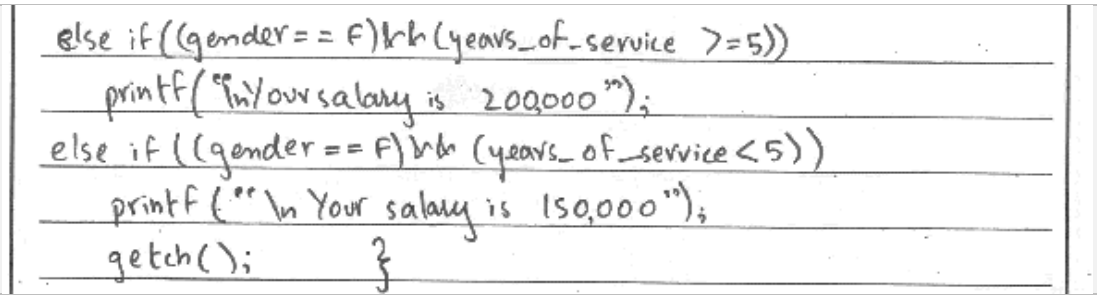
Any Additional Suggestion:
Teachers are recommended to familiarise candidates with the practical demonstration of the logic circuits using simulation tools such as multisim.

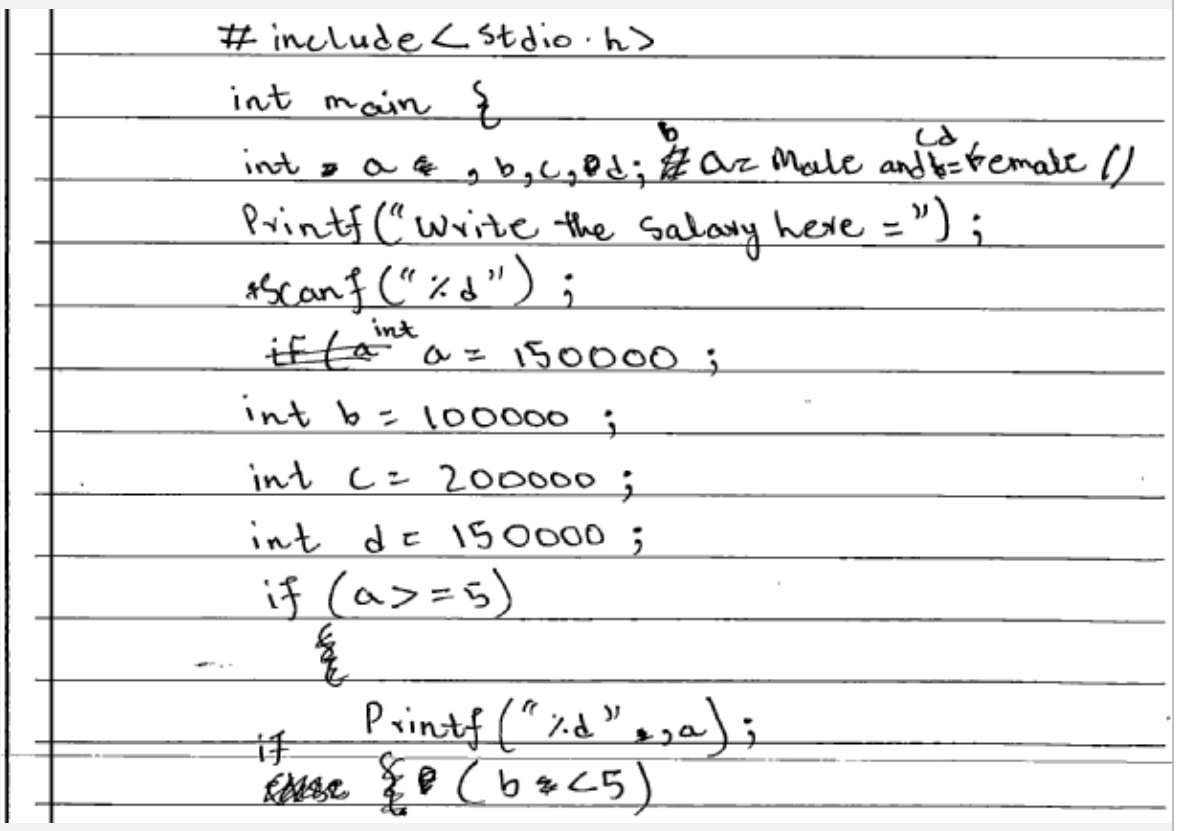
Extended Response Questions (ERQs)

These questions offered a choice between part **a** and **b**.

<table>
<tr><th colspan="2">Question No. 5a</th></tr>
<tr><td>Question Text</td><td>Write a C program to print the salary of an employee according to the given conditions. (Note: Take years of service and gender as an input.)

<table>
<tr><td>Gender</td><td>Years of Service</td><td>Salary</td></tr>
<tr><td rowspan="2">Male</td><td>>=5</td><td>150000</td></tr>
<tr><td><5</td><td>100000</td></tr>
<tr><td rowspan="2">Female</td><td>>=5</td><td>200000</td></tr>
<tr><td><5</td><td>150000</td></tr>
</table></td></tr>
<tr><td>SLO No.</td><td>10.1.8</td></tr>
<tr><td>SLO Text</td><td>Write C programs for the problems mentioned in 7.2.3 involving the use of if-else-if statement.</td></tr>
<tr><td>Max Marks</td><td>6</td></tr>
<tr><td>Cognitive Level</td><td>A</td></tr>
<tr><td>Checking Hints</td><td>1 mark for declaring the correct variable.
1 mark for taking the input.
1 mark for writing each correct conditions using correct operators. (FOUR required)</td></tr>
<tr><td>Overall Performance</td><td>As this was an ERQ, almost half of the cohort attempted this part. The overall performance of the candidates in this question was good. Many candidates demonstrated correct logic by utilising the if-else structure in their code solutions. However, there were instances where some candidates made errors in using operators and character declaration. Conversely, some candidates showcased their understanding by effectively employing the switch case statement which displayed high level of clarity in their program structure. Encouraging candidates to practice more programs using conditional structures can enhance their programming skills.</td></tr>
<tr><td>Description of Better Responses</td><td>In the better responses, the candidates effectively generated the desired output using proper variable declarations, input and output statements, and accurate conditional statements. Notably, the candidates demonstrated the ability to differentiate between character and numeric variable declaration, indicating a strong grasp of data types. The logical flow of the code was well-structured and efficiently achieved the intended result.</td></tr>
<tr><td>Image of Better Response</td><td> 
</td></tr>
</table>



Description of Weaker Responses	Weaker responses indicated a need for improvement in basic programming concepts, as candidates did not take the required input for the task. Additionally, the candidates were unable to showcase the use of if-else structure and logical operators, highlighting a gap in understanding conditional structures. Encouraging the candidates to practice more with conditional statements, logical operators, and input-output handling will be beneficial in strengthening their programming concepts.
Image of Weaker Response:	

Suggestions for improvement (Highlighted part)

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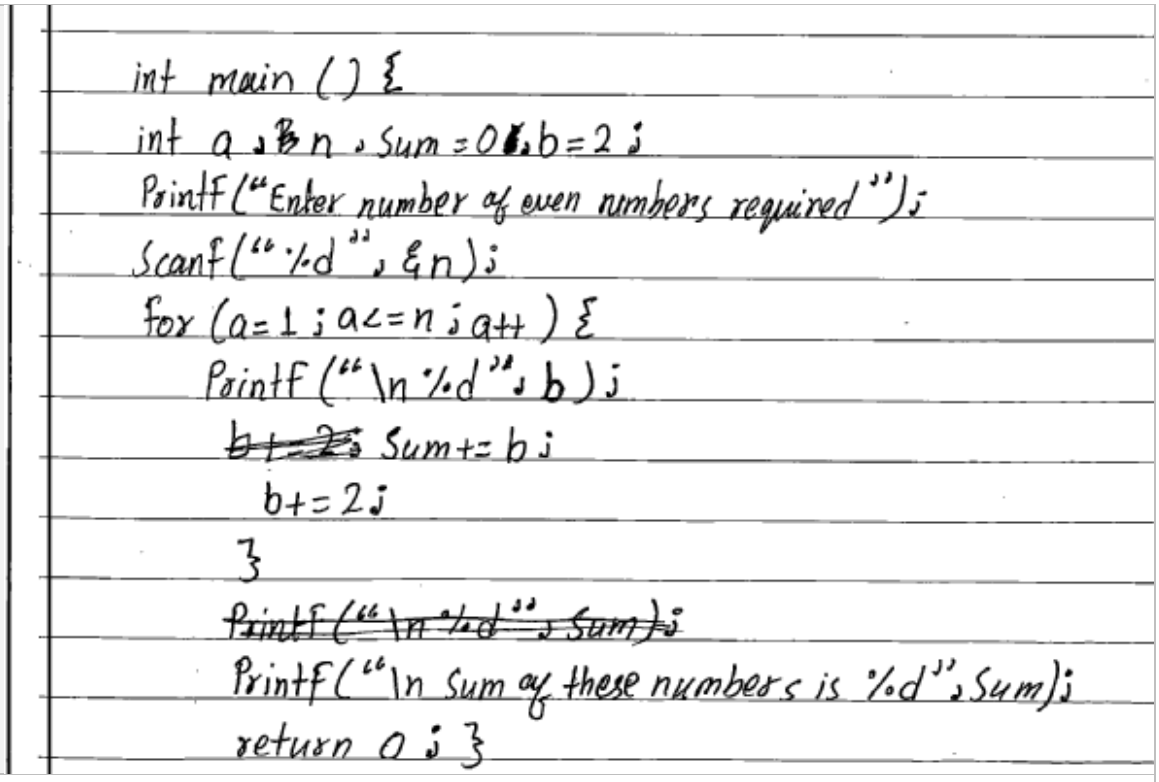
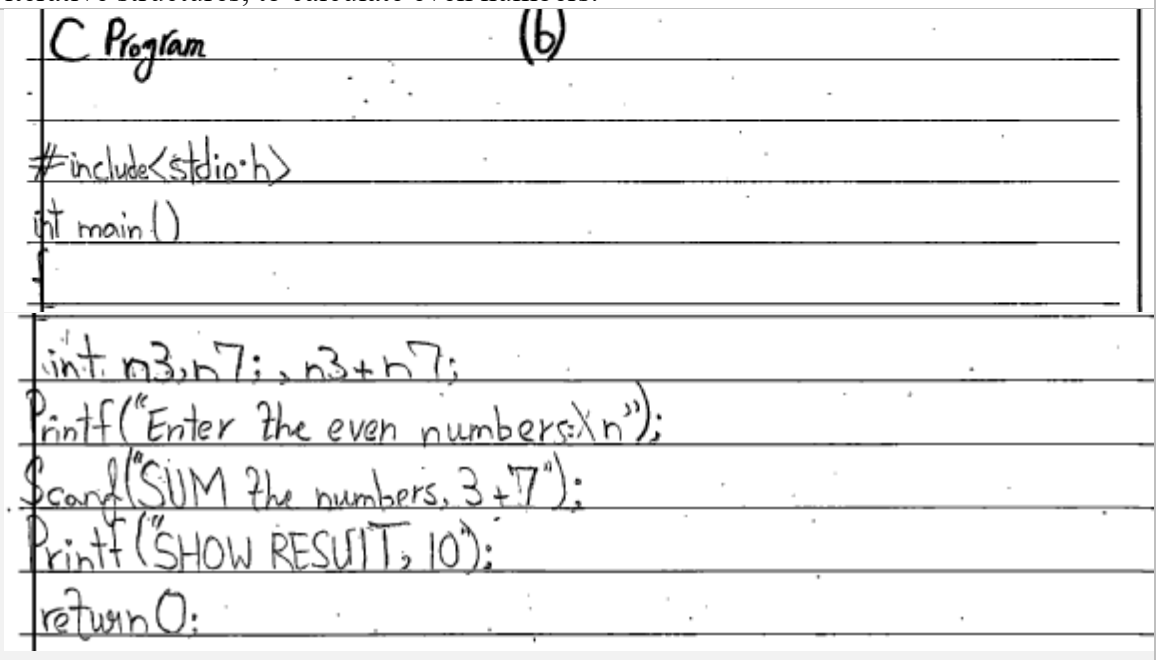
• Go through the past paper questions on that particular concept • Refer to the resource guide for extra resources	• Practical Demonstration	

Any Additional Suggestion:
Teachers are advised to focus on the basic programming concepts by providing some more practice programs of conditional structures to the candidates such as identification of a prime number etc.

Question No. 5b	
Question Text	Write a C program to i. take a number 'n' as an input. ii. print 'n' even numbers. iii. print the sum of those even numbers.
SLO No.	11.1.3
SLO Text	Write C programs for the problems mentioned in 7.2.3 involving use of for loop.
Max Marks	6
Cognitive Level	A
Checking Hints	1 mark for declaring correct variables. 1 mark for taking input. 1 mark for writing correct for loop. 1 mark for writing print statement inside loop. 1 mark for the formula for adding even numbers. 1 mark for writing the output.
Overall Performance	It was an ERQ, almost half of the cohort attempted this part. The overall performance of the entire candidates in this question was average, reflecting a mix of concepts. Some candidates lacked in implementing corrected looping statements, indicating a need for further understanding of looping structures. On the other hand, some candidates showed clear comprehension of programming structures and demonstrate a strong conceptual understanding of iterative structures. Encouraging candidates to practice more with loops will enhance their proficiency. Providing additional examples and exercises can support the cohort in strengthening their programming skills.
Description of Better Responses	In better responses, candidates successfully incorporated correct looping statements, a counter statement to calculate even numbers, proper variable declarations, and appropriate input and output statements. These elements demonstrated a sound understanding of programming concepts and effectively achieved the desired outcome.

Image of Better Response	
Description of Weaker Responses	Weaker responses displayed several shortcomings, such as not utilising an iterative statement and including irrelevant input and print statements. Such issues highlighted a lack of understanding and proficiency in applying fundamental programming concepts. To enhance the performance, the candidates should focus on incorporating appropriate iterative structures, to calculate even numbers.
Image of Weaker Response	

Suggestions for improvement (Highlighted part)

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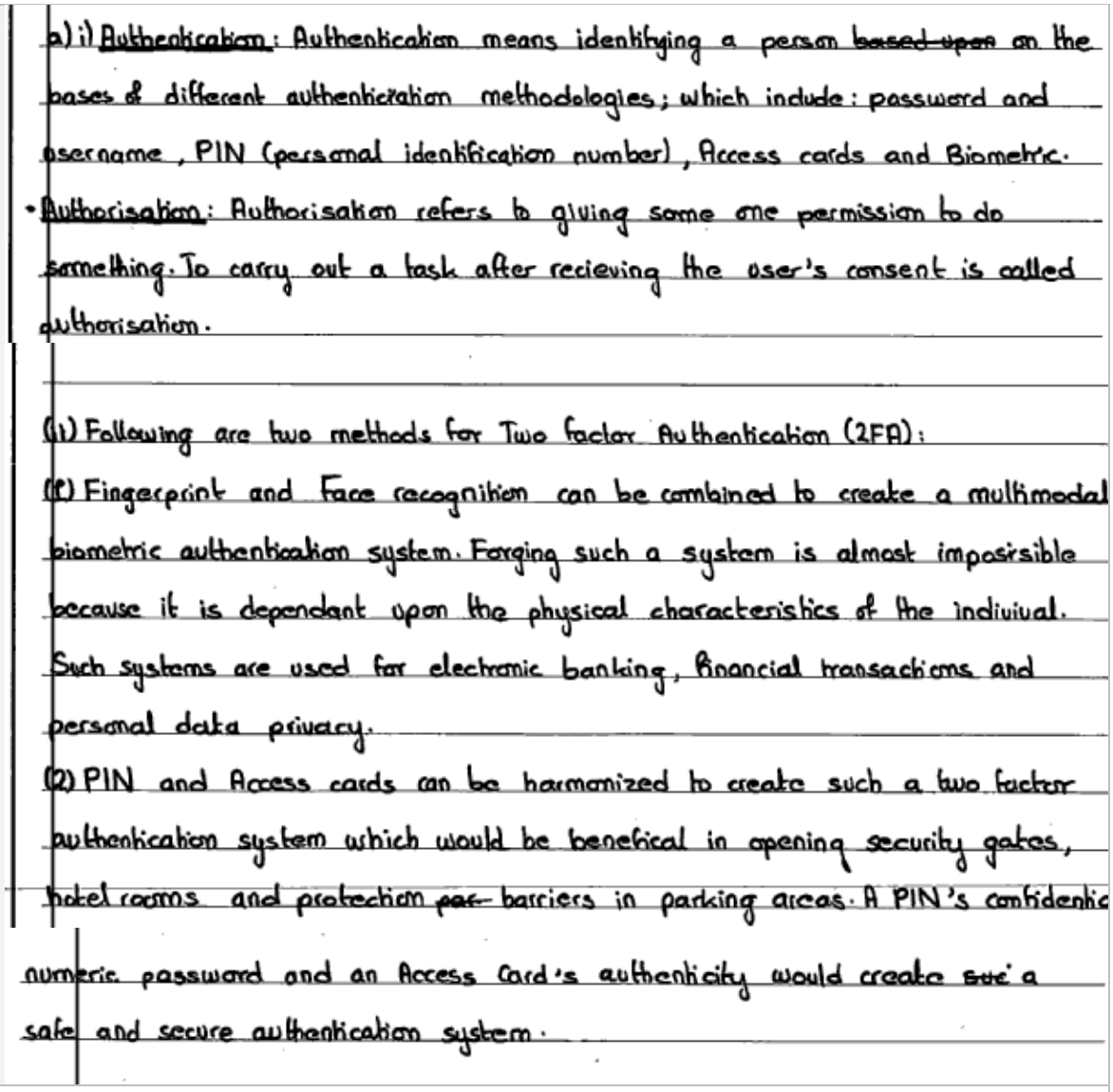
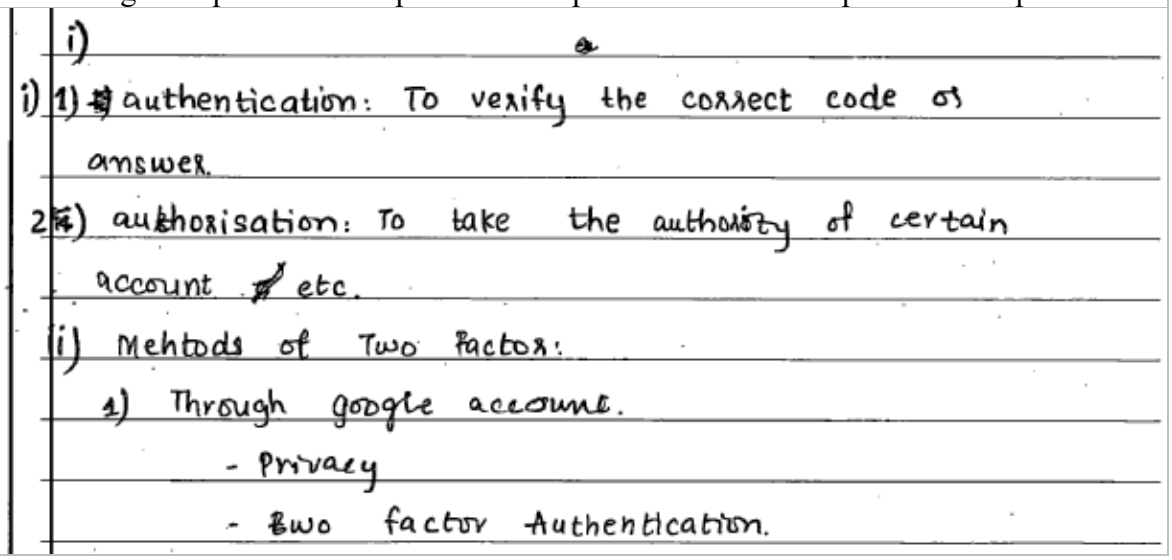
Any Additional Suggestion: Teachers are advised to focus on the basic programming concepts and provide candidates several practice programs of iterative structures such as printing the geometrical shape using loops etc.		

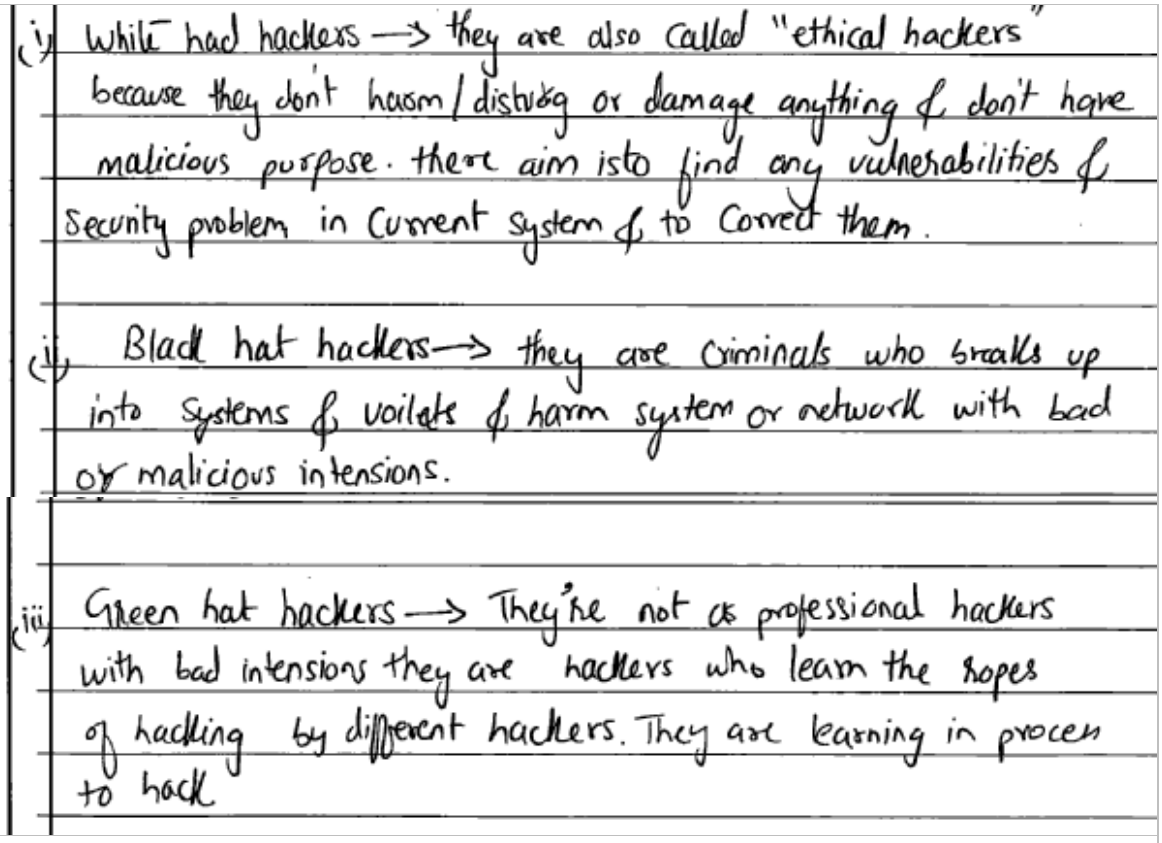
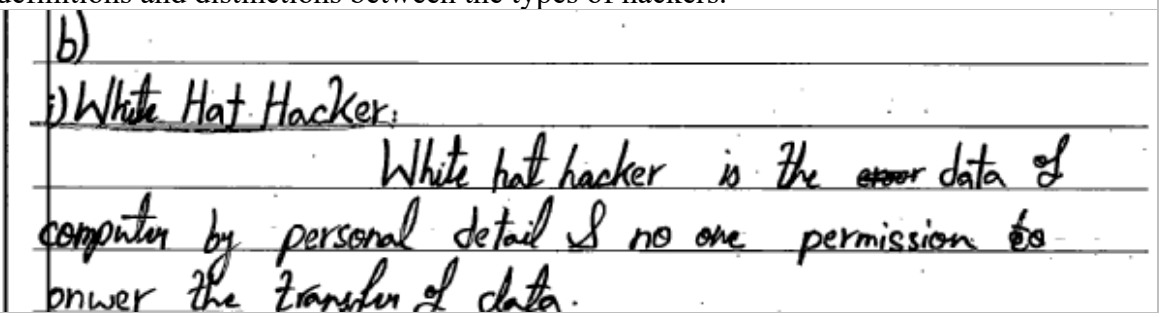
Question No. 6a	
Question Text	i. Describe authentication and authorisation. ii. Describe TWO methods for Two Factor Authentication (2FA).
SLO No.	14.3.1 14.3.2
SLO Text	Differentiate between authentication and authorisation. Differentiate between Two Factor Authentication (2FA) and Multifactor Authentication (MFA).
Max Marks	6
Cognitive Level	U
Checking Hints	1 mark each for the description of authentication and authorisation. 1 mark will be awarded for only stating authentication and authorisation. 1 mark for writing the names of authentication methods of 2FA. (Any TWO required) 1 mark for the describing each authentication methods of 2FA. (Any TWO required)
Overall Performance	As this was an ERQ question, majority of the candidates attempted this part. The overall responses in this question were commendable, as the candidates demonstrated a good understanding of authorisation and authentication methods by relating them to general life practices. The candidates' familiarity with concepts such as two-factor verification for Gmail and the criteria for biometrics, which are commonly practiced in daily life, enabled them to provide relevant and well-structured responses. Moreover, the use of two-factor authentication methods positively influenced the candidates' ability to address this question with confidence.
Description of Better Responses	In better responses, the candidates showed a good understanding of authentication methods and their significance in ensuring secure access to systems and data. The candidates displayed adequate knowledge of various authentication techniques like multi model biometric system and cardex system with PIN authentication method. Many such responses went beyond mere familiarity with common practices and demonstrated a comprehensive understanding of the topic.

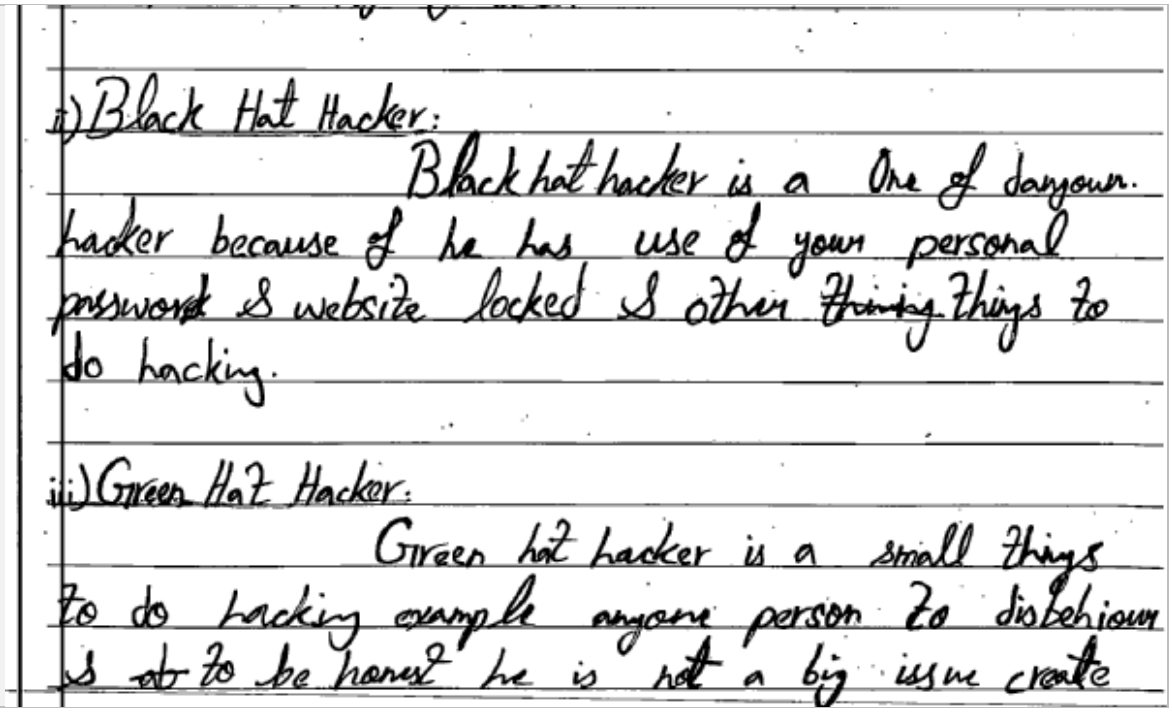
Image of Better Response	
Description of Weaker Responses	Weaker responses showed inaccuracy and lack of precision in describing authorisation and authentication methods. Candidates wrote general answers showing a lack in understanding of the concepts. Some candidates wrote google chrome and its 2FA as an authentication method, some candidates responded authentication methods as locking the door with two types of keys which was incorrect. Candidates should use appropriate keywords and terminologies to provide a comprehensive explanation of these important concepts.
Image of Weaker Response	

Suggestions for improvement (Highlighted part)

How to Approach SLO	Pedagogy Used for that SLO	Assessment Strategies
• Understand the expectations of the command words • Look at the cognitive level • Identify the content that is required to answer that question (both in terms of understanding of concepts and any skills that may be required like analysing or evaluating) • Go through the past paper questions on that particular concept • Refer to the resource guide for extra resources	• Story Board • Cause and Effect • Fish and Bone • Concept mapping • Audio Visual resources • Think, pair and share • Questioning Technique (Socratic approach) • Practical Demonstration	• Past paper questions • Discussion on E-Marking Notes • AKU-EB Digital Learning Solution powered by Knowledge Platform
Any Additional Suggestion: Teachers are advised to show the practical demonstration of this topic such as use of 2FA by social media sites to get access to the account etc.		

Question No. 6b	
Question Text	Describe the following types of hackers: i. White Hat Hacker ii. Black Hat Hacker iii. Green Hat Hacker
SLO No.	14.1.3
SLO Text	Differentiate among the types of hackers, i.e. script kiddie, white hat hackers, black hat hackers, grey hat hacker, green hat hackers, red hat hackers, blue hat hackers.
Max Marks	6
Cognitive Level	U
Checking Hints	1 mark for each highlighted point of white hat hacker (Any TWO required) 1 mark for each highlighted point of black hat hacker (Any TWO required) 1 mark for each highlighted point of green hat hacker (Any TWO required)
Overall Performance	As this was the ERQ, few candidates attempted this part. The overall performance of the candidates in this question was impressive, as it pertained to a commonly discussed and observed topic in daily life. Hacking is frequently shown in videos and shared on social broadcasting channels, making it a familiar concept. The candidates' excellent performance can be attributed to their prior knowledge and understanding of hacking, enabling them to provide accurate answers.
Description of Better Responses	In better responses, candidates showed commendable understanding of the three types of hackers, providing accurate definitions and clear distinctions between each category. Such candidates clearly differentiated white hat hackers as ethical hackers, black hat hackers as criminals and green hat hackers as learners of cybersecurity.

Image of Better Response	
Description of Weaker Responses	Weaker responses provided incorrect and inappropriate information, indicating a misunderstanding of the topic. Such responses indicated white hat hackers as the best hackers, black hat hackers as the most dangerous hackers and green hat hackers as not too dangerous hackers, these responses seemed too general. To enhance the response, the candidate should conduct further research and refer to reliable sources to provide accurate definitions and distinctions between the types of hackers.
Image of Weaker Response	



Suggestions for improvement (Highlighted part)

How to Approach SLO	Pedagogy Used for that SLO	Assessment Strategies
• Understand the expectations of the command words • Look at the cognitive level • Identify the content that is required to answer that question (both in terms of understanding of concepts and any skills that may be required like analysing or evaluating) • Go through the past paper questions on that particular concept • Refer to the resource guide for extra resources	• Story Board • Cause and Effect • Fish and Bone • Concept mapping • Audio Visual resources • Think, pair and share • Questioning Technique (Socratic approach) • Practical Demonstration	• Past paper questions • Discussion on E-Marking Notes • AKU-EB Digital Learning Solution powered by Knowledge Platform
Any Additional Suggestion: Teachers are advised to discuss real-life applications and case studies of cybersecurity to the candidates for clear and comprehensive understanding of the concept.		

Annexure A: Pedagogies Used for Teaching the SLOs

Pedagogy: Storyboard

Description: A visual pedagogy that uses a series of illustrated panels to present a narrative, encouraging creativity and critical thinking. It helps learners organise ideas, sequence events, and comprehend complex concepts through storytelling.

Example: In a Literature class, students are tasked with creating storyboards to visually retell a novel. They draw key scenes, write captions, and present their stories to the class, enhancing their reading comprehension and fostering their imagination.

Pedagogy: Cause and Effect

Description: This pedagogy explores the relationships between actions and consequences. By analysing cause-and-effect relationships, learners develop a deeper understanding of how events are interconnected and how one action can lead to various outcomes.

Example: In a History class, students study the causes and effects of the Industrial Revolution. They research and discuss how technological advancements in manufacturing led to significant societal changes, such as urbanisation and labour reform movements.

Pedagogy: Fish and Bone

Description: A method that breaks down complex topics into main ideas (the fish) and supporting details (the bones). This visual approach enhances comprehension by highlighting essential concepts and their relevant explanations.

Example: During a Biology class on human anatomy, the teacher uses the fish and bone technique to teach about the human skeletal system. Teacher presents the main components of the human skeleton (fish) and elaborates on each bone's structure and function (bones).

Pedagogy: Concept Mapping

Description: An effective way to visually represent relationships between ideas. Learners create diagrams connecting key concepts, aiding in understanding the overall structure of a subject and fostering retention.

Example: In a Psychology assignment, students use concept mapping to explore the various theories of personality. They interlink different theories, such as Freud's psychoanalysis, Jung's analytical psychology, and Bandura's social-cognitive theory, to see how they relate to each other.

Pedagogy: Audio Visual Resources

Description: Incorporating multimedia elements like videos, images, and audio into lessons. This approach caters to different learning styles, making educational content more engaging and memorable.

Example: In a General Science class, the teacher uses a documentary-style video to teach about the solar system. The video includes stunning visual animations of the planets, interviews with astronomers, and background music, enhancing students' interest and understanding of space.

Pedagogy: Think, Pair, and Share

Description: A collaborative learning technique where students ponder a question or problem individually, then discuss their thoughts in pairs or small groups before sharing with the entire class. It fosters active participation, communication skills, and diverse perspectives.

Example: In a Literature in English class, the teacher poses a thought-provoking question about a novel's moral dilemma. Students first reflect individually, then pair up to exchange their opinions, and finally participate in a lively class discussion to explore different viewpoints.

Pedagogy: Questioning Technique (Socratic Approach)

Description: Based on Socratic dialogue, this method stimulates critical thinking by posing thought-provoking questions. It encourages learners to explore ideas, justify their reasoning, and discover knowledge through a process of inquiry.

Example: In an Ethics class, the instructor uses the Socratic approach to lead a discussion on the meaning of justice. By asking a series of probing questions, the students engage in a deeper exploration of ethical principles and societal values.

Pedagogy: Practical Demonstration

Description: A hands-on approach where learners observe real-life applications of theories or skills. Practical demonstrations enhance comprehension, skill acquisition, and problem-solving abilities by bridging theoretical concepts with real-world scenarios.

Example: In a Food and Nutrition class, the instructor demonstrates the proper technique for filleting a fish. Students observe and then practice the skill themselves, learning the practical application of knife skills and culinary precision.

(**Note:** The examples provided in this annexure serve as illustrations of various pedagogies. It is important to understand that these pedagogies are versatile and can be applied across subjects in numerous ways. Feel free to adapt and explore these techniques creatively to enhance learning outcomes in your specific context.)

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