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HSSC-I NATIONAL BOOK FOUNDATION FBISE

COMPUTER TEST - CHAPTER 2: COMPUTATIONAL THINKING & ALGORITHMS

Name:		Roll No.		Section:

Total Time: 2:30 Hour
Time Allowed: 150 Minutes

Total Marks: 150

PAPER OBJECTIVE
SECTION-A (MARKS 150)

NOTE: Section-A is compulsory. All parts of this section are to be answered on these pages and handed over to the center superintendent. Deleting / overwriting is not allowed. Do not use lead pencil.

Q.1 Fill the relevant bubble for each part. All parts carry one mark.

Questions	A	B	C	D	A B C D
1. Computational thinking is a thought process that helps us:	Repair hardware	Design web pages only	Understand a problem and solve it the way computers do	Type faster	○○●○
2. Computers work by following the:	Input- process-output model	Read-only model	Output- input-process model	Store-delete-print model	●○○○
3. Simplifying a problem by focusing on the most relevant aspects and ignoring unnecessary details is called:	Pattern recognition	Decomposition	Abstraction	Debugging	○○●○
4. Breaking a complex problem into smaller, manageable sub-problems is called:	Pattern recognition	Abstraction	Compilation	Decomposition	○○○●
5. Identifying patterns or trends within data or problems is called:	Algorithm design	Decomposition	Pattern recognition	Abstraction	○○●○
6. Developing a step-by-step solution to a problem is called:	Abstraction	Decomposition	Algorithmic design	Pattern recognition	○○●○
7. When creating a website, abstraction means focusing on:	Hardware details	Network cables	Main design and functionality, not coding details	Every line of code	○○●○
8. Breaking a mobile app task into UI design, coding features and data storage is an example of:	Pattern recognition	Abstraction	Decomposition	Testing	○○●○
9. Finding which website pages users visit most is an example of:	Abstraction	Decomposition	Pattern recognition	Debugging	○○●○
10. A problem is a challenge or situation for which a:	Network is required	Printer is required	Solution is required	Computer is required	○○●○
11. Which of the following is NOT a property of computational thinking in the book?	Decomposition	Pattern recognition	Abstraction	Compilation	○○○●

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Questions	A	B	C	D	A B C D
12. Computational artifacts refer to:	Only hardware devices	Only printed books	Only natural objects	Human-made objects and systems using computational thinking	○○○●
13. An artifact is a _____ of software.	Cable	Byproduct	License	Virus	○●○○
14. Which of the following can be a computational artifact?	Digital animation	Glass bottle	Raw coal	Wooden table	●○○○
15. In software development, artifacts help describe the software's:	Weight	Price only	Architecture, design and function	Colour only	○○●○
16. Artifacts generated during computational thinking are used before the:	Problem definition	Planning phase	Feasibility study	Coding phase	○○○●
17. Which of the following is a design method for computational solutions?	Pseudocode	Firewall	Spreadsheet	Compiler	●○○○
18. A step-by-step set of instructions defining how a problem should be solved is a(n):	Algorithm	Protocol	Compiler	Database	●○○○
19. Algorithms are normally written in:	Natural language	Machine code	Binary only	Assembly only	●○○○
20. An algorithm is a high-level description that ignores:	The inputs	The problem statement	Implementation details such as the programming language	The outputs	○○●○
21. A visual representation of flow and logic using defined symbols is a:	Truth table	Pseudocode	Spreadsheet	Flowchart	○○○●
22. Flowcharts are mostly helpful in explaining:	Hardware wiring	Memory sizes	Complex loops and decision-making processes	Network cables	○○●○
23. An intermediate step between an algorithm and actual programming code is:	Flowchart	Compiler	Pseudocode	Debugger	○○●○
24. Pseudocode uses a combination of natural language and:	Machine code	Circuit symbols	Binary digits	Simplified programming constructs	○○○●
25. For simpler tasks, some programmers skip:	Algorithms entirely and code	Inputs	Testing	Flowcharts	○○○●
26. In the Add Two Numbers algorithm, the result is stored in a variable called:	total1	sum	result_x	num3	○●○○
27. In pseudocode, the statement sum <- num1 + num2 is a(n):	Comment	Assignment	Comparison	Loop	○●○○

Questions	A	B	C	D	A B C D
28. If num1 = 4 and num2 = 6, then sum <- num1 + num2 gives sum equal to:	10	2	24	46	●○○○
29. The even or odd pseudocode checks the condition:	num * 2 = 0	num - 2 = 0	num % 2 = 0	num + 2 = 0	○○●○
30. In the even/odd algorithm, if the remainder is 0, the output is:	Zero	The number is odd	The number is even	Error	○○●○
31. For num = 10, the even/odd algorithm outputs:	The number is odd	The number is even	Ten	Error	○●○○
32. The primary goal of pseudocode is to convey the algorithm's logic:	Clearly, irrespective of programming language	Only in Python	Only in C++	Only in binary	●○○○
33. Pseudocode writing is:	Not standardized	Strictly standardized	Fixed by ISO rules only	Possible only in English letters	●○○○
34. A commonly used pseudocode font size is around:	1 point	10-12 points	2-4 points	40-50 points	○●○○
35. Consistent indentation in pseudocode commonly uses:	20 spaces	2-4 spaces or a tab	No spaces	Only commas	○●○○
36. In pseudocode, using uppercase for keywords and lowercase for variables:	Is forbidden	Causes errors	Enhances readability	Is compulsory	○○●○
37. Line numbers in pseudocode are:	Optional	Forbidden	Used only in flowcharts	Compulsory	●○○○
38. Single-line comments in pseudocode are often denoted by:	<<	##	//	@@	○○●○
39. Variables in pseudocode can be declared using:	PRINTF	DECLARE	CLOSE	FETCH	○●○○
40. In pseudocode, data type keywords such as INTEGER and STRING are:	Forbidden	Compulsory	Used for comments	Optional	○○○●
41. Key commands in pseudocode include:	PRINTER, MOUSE, KEYBOARD	INPUT, OUTPUT, FOR, IF, WHILE	SAVE, OPEN, CLOSE only	COPY, PASTE only	○●○○
42. Common pseudocode operators include:	### only	&&& only	+, -, *, /, =, <, >	$$ only	○○●○
43. The first step in planning a computational artifact is to:	Test the algorithm	Write the manual	Define the problem	Deploy the system	○○●○
44. In planning an artifact, you should list the inputs and the:	Colours	Expected outputs	Cables	Salaries	○●○○

Questions	A	B	C	D	A B C D
45. A data structure is a:	Type of virus	Network cable	Printer driver	Storage to save and organize data	○○○●
46. Which of the following is a data structure?	Array	Router	Monitor	Bus	●○○○
47. Control structures determine the:	Speed of the monitor	Colour of screen	Order of program execution	Size of memory	○○●○
48. Skipping some program statements is usually done using:	Conditional statements	Variables	Loops	Comments	●○○○
49. Repeating one or more program statements is done using:	Constants	Conditional statements	Loops	Comments	○○●○
50. The number of steps in an algorithm should be:	Infinite	Finite	Unlimited	Random	○●○○
51. The last step of planning and developing an artifact is to:	Define the problem	Choose data structures	List the inputs	Test the algorithm	○○○●
52. In the book's example, a Jeroo is a:	Programming language	Network device	Computer virus	Kangaroo-like animal	○○○●
53. In the Jeroo problem, the field is divided into a:	5 x 5 matrix	3 x 3 matrix	10 x 10 matrix	2 x 2 matrix	●○○○
54. In the Jeroo problem, the top-left corner of the matrix is:	(0, 0)	(5, 5)	(0, 5)	(1, 1)	●○○○
55. In the Jeroo problem, the Jeroo starts at (0, 0) facing:	East	North	South	West	●○○○
56. In the Jeroo problem, the flower is initially located at:	(2, 3)	(3, 2)	(3, 0)	(0, 3)	○○●○
57. In the Jeroo problem, the flower is to be planted at:	(2, 3)	(3, 0)	(0, 0)	(3, 2)	○○○●
58. A Jeroo moves by:	Flying	Swimming	Rolling	Hopping	○○○●
59. Finding the area of a circle of radius 3 m is specific; a generalized algorithm uses:	A = 2r	A = 3.14 x 9	A = r + 3	A = πr²	○○○●
60. A simplified formula for the perimeter of a square is:	side + side	4 x side	side x side	2 x side	○●○○
61. Computational artifacts should be tested by considering potential:	Power cuts	Logical errors	Paper sizes	Colour choices	○●○○

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Questions	A	B	C	D	A B C D
62. Testing and refinement of a computational artifact is an:	Random process	Optional process	Iterative process	One-time process	○○●○
63. Tracing an algorithm is also known as:	Deployment	Desk check or dry run	Encryption	Compilation	○●○○
64. Tracing means to:	Hand simulate the execution of an algorithm	Compile the code	Delete the code	Encrypt the code	●○○○
65. Tracing is done before writing code to:	Verify the algorithm works correctly	Install software	Draw logic gates	Increase memory	●○○○
66. The first step in tracing an algorithm is to:	Initialize variables	Understand the algorithm	Verify output	Choose test input	○●○○
67. The step that follows 'Understand the Algorithm' in tracing is:	Trace each step	Repeat until completion	Verify output	Choose test input	○○○●
68. In tracing, initialization means:	Setting variables and data structures to their initial state	Ending the algorithm	Deleting variables	Printing output	●○○○
69. The last step in tracing an algorithm is to:	Choose test input	Initialize variables	Verify the output	Understand the algorithm	○○●○
70. During tracing, the sequence of steps may be broken by loops, conditional statements and:	Function calls	Fonts	Comments	Titles	●○○○
71. A technique that shows how variables change at each stage of an algorithm is a:	Truth table	Trace table	Time table	Symbol table	○●○○
72. Trace tables help to find:	Hardware faults	Logical errors	Typing speed	Network faults	○●○○
73. The most fundamental algorithm evaluation parameter is:	Correctness	Length	Clarity	Colour	●○○○
74. Correctness means an algorithm produces the desired output for:	Only invalid inputs	No inputs	Only one input	All possible valid inputs	○○○●
75. Efficiency of an algorithm deals with:	Colour and font	Time and space complexity	Number of users	Cost of paper	○●○○
76. Time complexity is the amount of _____ taken by an algorithm to run.	Money	Memory	Time	Paper	○○●○
77. Space complexity is the amount of _____ required to run an algorithm.	Electricity	Money	Time	Memory	○○○●
78. Clarity refers to how easily the algorithm's logic can be:	Encrypted	Printed	Understood by humans	Compiled	○○●○

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Questions	A	B	C	D	A B C D
79. Reliability refers to the ability to always produce:	Colourful outputs	Long outputs	Random results	Correct and accurate results	○○○●
80. Sorting algorithms arrange data in:	Alphabet shape	Ascending or descending order	Random order only	Binary form only	○●○○
81. Which two sorting algorithms are discussed in the book?	Stack and queue	Merge and quick only	Binary sort and linear sort	Insertion sort and bubble sort	○○○●
82. Arranging numbers from smallest to largest is called _____ order.	Ascending	Mixed	Descending	Random	●○○○
83. Arranging numbers from largest to smallest is called _____ order.	Random	Descending	Ascending	Mixed	○●○○
84. In insertion sort, the first element is assumed to be:	Invalid	Largest	Deleted	Already sorted	○○○●
85. In the insertion sort example, yellow represents:	The unsorted array	The sorted array	Elements to be compared	Elements to delete	●○○○
86. In the insertion sort example, blue represents:	The sorted array	Wrong elements	The unsorted array	Elements to be compared	○○○●
87. In the insertion sort example, green represents:	The unsorted array	The pivot	The sorted array	Elements to be compared	○○●○
88. In the insertion sort example, red represents:	Deleted elements	The sorted array	The unsorted array	Elements not correct in the sorted part	○○○●
89. The array 12, 31, 25, 8, 32, 17 sorted in ascending order by insertion sort becomes:	32, 31, 25, 17, 12, 8	8, 12, 17, 25, 31, 32	8, 12, 25, 17, 31, 32	12, 8, 17, 25, 31, 32	○●○○
90. The insertion sort algorithm design starts with the:	Second element	Largest element	Last element	Middle element	●○○○
91. The insertion sort process involves picking each item and:	Deleting it	Inserting it into its correct position	Copying it twice	Hiding it	○●○○
92. Which is a sub-process in the decomposition of insertion sort?	Encrypt and decrypt	Pick and insert	Boot and shutdown	Compile and run	○●○○
93. In bubble sort, adjacent elements are repeatedly compared and:	Deleted	Added	Multiplied	Swapped if not in correct order	○○○●
94. After the first iteration of bubble sort (ascending), the largest element is at the:	End of the array	Not fixed	Middle of the array	Start of the array	●○○○
95. For n elements, the number of bubble sort iterations required is:	2n	n + 1	n x n	n - 1	○○○●

Questions	A	B	C	D	A B C D
96. Bubble sort needs how many iterations for 6 elements?	7	6	12	5	○○○●
97. After the first iteration of bubble sort on 31, 32, 26, 35, 10 (ascending), the last element is:	35	10	31	26	●○○○
98. After sorting 3, 1, 2 in ascending order using bubble sort, the array is:	3, 2, 1	1, 2, 3	1, 3, 2	2, 1, 3	○●○○
99. In bubble sort, if the first element is smaller than or equal to the next:	Stop the algorithm	Delete one	Do nothing and move to the next pair	Swap them	○○●○
100. In bubble sort, after each iteration the next largest unsorted element:	Is duplicated	Is deleted	Is placed in its correct position	Moves to the start	○○●○
101. Bubble sort is mainly used for:	Video games only	Huge databases	Educational purposes	Real-time systems only	○○●○
102. Insertion sort is practical for nearly sorted data and:	Very large data sets	Image files	A small number of items	Audio files	○○●○
103. In the shelf-of-books example, insertion sort means:	Comparing only the first two books	Colouring books	Picking each book and inserting it in its correct position	Throwing books away	○○●○
104. The efficiency of a sorting algorithm is represented by time taken and the number of:	Colours	Pages	Movements	Users	○○●○
105. Pairwise comparison is a pattern in:	Linear search	Flowcharts	Binary search	Bubble sort	○○○●
106. Searching algorithms are used to:	Arrange elements	Find a desired element in a group of elements	Delete elements	Print elements	○●○○
107. Two searching methods discussed in the book are:	Bubble and insertion search	Stack and queue search	Binary search and linear search	Merge and quick search	○○●○
108. Binary search works on:	Unsorted lists only	Sorted lists	Only images	Only text files	○●○○
109. Binary search follows which approach?	Brute force only	Trial and error	Random choice	Divide and conquer	○○○●
110. In binary search, the item to be searched is first compared with the:	First element	Smallest element	Last element	Middle element	○○○●
111. In binary search, if the middle element matches the item:	Its location is returned	NULL is returned	The list is sorted again	The search continues	●○○○
112. If the item is not found, the searching algorithm returns:	Zero always	The first element	NULL	The largest element	○○●○

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Questions	A	B	C	D	A B C D
113. In a sorted array with indexes 0 to 8, the first middle element is at index:	3	5	8	4	○○○●
114. In binary search, each iteration reduces the search space by:	One element only	Half	A quarter	None	○●○○
115. The core pattern of binary search is:	Halving the search space	Sorting twice	Moving one element at a time	Swapping pairs	●○○○
116. In binary search, if the middle element is greater than the target, you:	Sort the array	Stop the search	Ignore the right half	Ignore the left half	○○●○
117. In binary search, if the middle element is less than the target, you:	Delete the target	Ignore the left half	Return NULL	Ignore the right half	○●○○
118. In the book's binary search example, 56 is found at location:	8	7	6	4	○●○○
119. A binary search on a sorted list of 7 elements needs at most how many comparisons?	1	5	7	3	○○○●
120. Linear search is also called:	Hash search	Sequential search	Divide search	Binary search	○●○○
121. Linear search begins from the:	First element	Largest element	Middle element	Last element	●○○○
122. Linear search stops when the target is found or the:	List is sorted	Array is deleted	Memory is full	End of the collection is reached	○○○●
123. In the book's linear search example, item 41 is found at location:	4	5	6	1	○●○○
124. The process of moving through a collection one item at a time is the pattern of:	Linear search	Binary search	Bubble sort	Insertion sort	●○○○
125. Which search is better suited to a sorted list?	Binary search	No search	Bubble search	Linear search only	●○○○
126. Which search checks items one by one in order?	Linear search	Insertion sort	Binary search	Bubble sort	●○○○
127. The multiplication table algorithm with m = n * c repeats while:	m = 1	c <= 10	c > 10	n = 0	○●○○
128. Computational thinking can be applied in:	Only medicine	Only art	Only mathematics	Any field including computer science	○○○●
129. The 5 x 5 matrix in the Jeroo problem has how many cells?	20	5	25	10	○○●○

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Questions	A	B	C	D	A B C D
130. Meeting notes, source code and diagrams are artifacts generated during:	Software development	Painting	Cooking	Farming	●○○○
131. E-commerce platforms and mobile applications are examples of:	Network cables	Operating systems only	Logic gates	Computational artifacts	○○○●
132. Using uppercase for keywords such as FOR and IF in pseudocode helps:	Encryption	Readability	Compilation	Printing	○●○○
133. In pseudocode, italicizing or bolding keywords is:	Compulsory	Not a strict rule	Required for loops	Forbidden	○●○○
134. The final step of the Add Two Numbers algorithm is to:	Store the result in a variable	Input two numbers	Add num1 and num2	Output the value of sum	○○○●
135. During tracing, 'Update variables' means keeping an eye on:	Printer status	Screen colour	Network speed	Changes in variable values	○○○●
136. Testing should consider what happens if a user enters:	Invalid or out-of-range input	No hardware	A password	Only valid input	●○○○
137. The Jeroo should end up one hop:	East of the planting location	West of the start	North of the field	South of the start	●○○○
138. Making an algorithm more general and simpler is part of:	Refining the algorithm	Deleting the algorithm	Deploying the algorithm	Printing the algorithm	●○○○
139. In the Jeroo example, the Jeroo must avoid water, nets and other:	Flowers	Jeroos	Programs	Users	○●○○
140. The correct order of the first three steps in planning an artifact is define the problem, list inputs/outputs and:	Plan	Deploy	Maintain	Document	●○○○
141. Choosing data structures and control structures happens in the:	Test step	Plan step	Maintenance step	Deployment step	○●○○
142. The sequential order of program execution is disturbed by skipping and:	Deleting statements	Repeating statements	Printing statements	Saving statements	○●○○
143. Insertion sort in computational thinking: the abstraction is picking each item and inserting it in its correct position relative to:	The first item only	The largest item only	Items not yet seen	Items already sorted	○○○●
144. Which parameter judges whether an algorithm meets its intended objectives for all valid inputs?	Font	Clarity	Cost	Correctness	○○○●
145. Which is NOT an algorithm evaluation parameter in the book?	Efficiency	Correctness	Reliability	Colour	○○○●
146. Algorithm evaluation parameters include correctness, efficiency, clarity and:	Price	Reliability	Colour	Speed of typing	○●○○

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Questions	A	B	C	D	A B C D
147. Pseudocode is described as a detailed plan of how an algorithm should be:	Deleted	Implemented	Compressed	Printed	○●○○
148. A flowchart for adding two numbers uses an input, a process and an:	Delay	Error	Output	Alarm	○○●○
149. The even/odd pseudocode uses which control structure?	if ... then ... else	for loop only	goto	while loop only	●○○○
150. In the sorting examples, the sorted array starts with how many elements in insertion sort?	One	Two	Zero	Three	●○○○

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