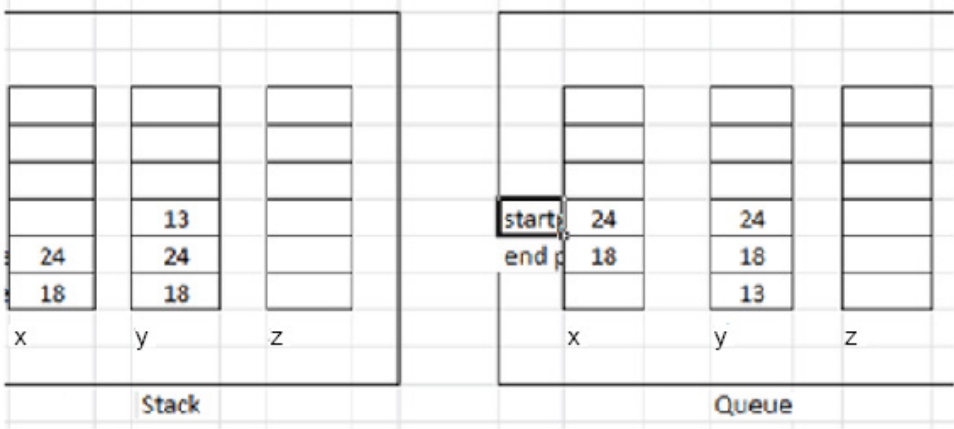
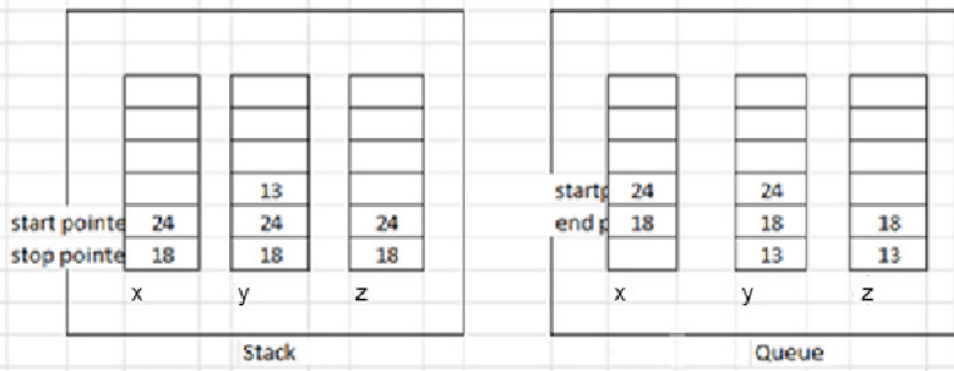


Question	Answer	Marks
2(a)(i)	<p>A sizeable number of candidates struggled with question 2 as they did not have adequate knowledge on the concept of data structures.</p> <p>Two marks from the following</p> <ul style="list-style-type: none"> List of data items where elements can be added by pushing them on the top / push Removed by popping them out from the top / pop LIFO accept FILO <p><i>Accept mention of PUSH and POP for one mark</i></p>	2
2(a)(ii)	<p>Two marks from the following</p> <ul style="list-style-type: none"> List of data items where elements can be added by inserting it at the rear of the queue / enqueue removed at the front of the queue / dequeue FIFO accept LILO <p><i>Accept mention of enqueue and dequeue for one mark</i></p>	2
2(b)(i)	 <p>One mark for correct completion of column y for stack One mark for correct completion of column y for queue <i>Allow FT if position is incorrect for both columns</i></p>	2
2(b)(ii)	 <p>One mark for correct completion of column z for stack One mark for correct completion of column z for queue <i>Allow FT if position is incorrect for both columns</i></p>	2
2(c)(i)	<p>Two marks from the following</p> <ul style="list-style-type: none"> flexibility to shrink or grow // size not fixed size of the list can be modified during the operations performed on it elements are kept at any location and linked to each other by the use of pointers 	2

Question	Answer	Marks
2(c)(ii)	<p>Four marks from the following</p> <ul style="list-style-type: none"> • Check for list full // check for free space • If not full then get pointer to free space • Store data at the address indicated by the pointer • Replace free space pointer with pointer from address where data item has been stored • If list full exit with error message 	4
	<p><i>Most candidates were better prepared for this question. Good mastery of concepts was well demonstrated by the majority of the candidates. Some candidates were however not too sure about the difference between logic and runtime errors.</i></p>	
3(a)(i)	<p>Two marks from the following</p> <ul style="list-style-type: none"> • incorrect programming language grammar / punctuation • Program does not compile / cannot be run 	2
3(a)(ii)	<p>Two marks from the following</p> <ul style="list-style-type: none"> • Mistakes in the design of a program / algorithm • Program produces incorrect / unexpected result(s) 	2
3(a)(iii)	<p>Two marks from the following</p> <ul style="list-style-type: none"> • Errors that cause problems with execution of the program • Program may unexpectedly exit / hang when encounters a runtime error 	2
	<p><i>There was a typo that could potentially confuse some candidates on the part(b) section of the question. As a result a special marking approach was employed so as not to disadvantage any candidate.</i></p>	
3(b)(i)	<p>One mark for identification of error, One mark for correction</p> <p>Error: line 11 // bmi_class ← "normal"</p> <p>Correction: bmi_class ← "normal"</p>	2
3(b)(ii)	<p>One mark for identification of error, One mark for correction</p> <p>Error: line 12 // ELSE IF bmi > 25 AND bmi <= 29 THEN</p> <p>Correction: ELSE IF bmi >= 25 AND bmi <= 29 THEN</p>	2
3(b)(iii)	<p>One mark for identification of error, One mark for correction</p> <p>Error: missing = line 4 // IF height < 0 OR weight <= 0 THEN</p> <p>Correction: IF height <= 0 OR weight <= 0 THEN</p>	2

Question	Answer	Marks																																																								
4	<p><i>This is a typical question that detects how Computer Science requires precision and exactness in answers. There were a number of correct answers that demonstrated good understanding and mastery of concepts. Unfortunately the same mastery could not be illustrated by candidates from certain centres.</i></p> <p>Five marks One mark for count, y and Output columns One mark for column x (3,2,1,0) one mark fully correct column x</p> <table border="1"> <thead> <tr> <th>count</th> <th>x</th> <th>y</th> <th>Output</th> </tr> </thead> <tbody> <tr><td>1</td><td></td><td></td><td></td></tr> <tr><td></td><td>3</td><td>5</td><td>5</td></tr> <tr><td></td><td>2</td><td></td><td>5</td></tr> <tr><td></td><td>1</td><td></td><td>5</td></tr> <tr><td></td><td>0</td><td></td><td></td></tr> <tr><td>2</td><td>2</td><td>4</td><td>4</td></tr> <tr><td></td><td>1</td><td></td><td>4</td></tr> <tr><td></td><td>0</td><td></td><td></td></tr> <tr><td>3</td><td>3</td><td>2</td><td>2</td></tr> <tr><td></td><td>2</td><td></td><td>2</td></tr> <tr><td></td><td>1</td><td></td><td>2</td></tr> <tr><td></td><td>0</td><td></td><td></td></tr> <tr><td>4</td><td></td><td></td><td></td></tr> </tbody> </table> <p>Note allow repeated values in the count and y columns</p>	count	x	y	Output	1					3	5	5		2		5		1		5		0			2	2	4	4		1		4		0			3	3	2	2		2		2		1		2		0			4				5
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Question	Answer	Marks
5	<p>Although only a handful of candidates managed score full marks of this question, the attempts made helped candidates to score well in this question. Very few candidates from certain centres did not make attempts at all. All candidates are encouraged to make attempts instead of leaving the question blank.</p> <p>Ten marks from the following</p> <p>MP1 Initialisation of valid attempts and invalid attempts to zero MP2 Enter access code MP3 Check if access code is 9999 MP4 Check access code is in the access code list if it is not 9999 MP5 If access code in list... MP6 ...increment number of valid attempts, allow entry to library MP7 If access code not in list... MP8 ... allow two further attempts MP9 if three attempts fail... MP10 ...increment number of invalid attempts MP11 ...display "Entry Denied" or similar message MP12 Output number of valid attempts, invalid attempts when 9999 is input as an access code MP13 Use of meaningful identifiers MP14 Use of loop to allow for multiple learners to access the library MP15 Suitable messages seen for all prompts and outputs</p> <p>Sample answer</p> <pre> Attempt ← 0 Visit ← 0 Times ← 0 NoCodes ← Length(ValidCodes[]) REPEAT PRINT "Please enter access code" INPUT AccessCode IF AccessCode = 9999 THEN PRINT "Number of learners visiting the library is ", Visit PRINT "Number of times a learner was denied access is ", Times ELSE Try ← 0 Counter ← 0 Valid ← FALSE WHILE NOT Valid OR Try < 3 REPEAT IF AccessCode = ValidCode[Counter] THEN Visit ← Visit + 1 Valid ← TRUE Print "Access granted" ELSE Counter ← Counter + 1 ENDIF UNTIL Counter = NoCodes IF NOT Valid THEN </pre>	10
	<pre>IF Try = 3 THEN Times ← Times + 1THENPrint "Entry Denied"ENDIF UNTIL AccessCode = 9999 </pre>	

Question	Answer	Marks																			
6(a)	<p><i>A sizeable number of candidates scored well in this question. Some candidates struggled to come up with meaningful flowcharts on part(b), a concept that seemed alien to them. Teachers are encouraged to give candidates exposure to the algorithm techniques prescribed in the syllabus.</i></p> <table border="1"> <thead> <tr> <th colspan="3">INPUT</th> <th rowspan="2">OUTPUT</th> </tr> <tr> <th>x</th> <th>y</th> <th>z</th> </tr> </thead> <tbody> <tr> <td>6</td> <td>10</td> <td>8</td> <td>10</td> </tr> <tr> <td>5</td> <td>2</td> <td>9</td> <td>9</td> </tr> <tr> <td>3</td> <td>5</td> <td>3</td> <td>5</td> </tr> </tbody> </table> <p style="text-align: center;">One mark for each correct output</p>	INPUT			OUTPUT	x	y	z	6	10	8	10	5	2	9	9	3	5	3	5	3
INPUT			OUTPUT																		
x	y	z																			
6	10	8	10																		
5	2	9	9																		
3	5	3	5																		

Question	Answer	Marks
6(b)	<pre> graph TD Start([START]) --> Init["I = OPEN O = OPEN Alarm = OFF"] Init --> ReadW[/Read W/] ReadW --> D1{IS W < L?} D1 -- YES --> IShut["I = SHUT"] D1 -- NO --> IOpen["I = OPEN"] IOpen --> D2{IS W > L?} D2 -- YES --> OShut["O = SHUT Time = Time + 1"] D2 -- NO --> OOpen["O = OPEN"] OShut --> D3{IS Time = 5?} OOpen --> D3 IShut --> D3 D3 -- YES --> Alarm["Alarm = ON"] Alarm --> Stop([STOP]) D3 -- NO --> ReadW Time0["Time = 0"] --> OShut </pre> <p>Eight marks from MP1 initialising I and O MP2 input water level MP3 condition 1 (if $W \geq H$)... MP4 ... with correct options MP5 condition 2 (if $W < L$) MP6 ... with correct options MP7 Incrementing Time MP8 Checking if five minutes have passed ... MP9 ... sound alarm //alarm on MP10 for recursive structure MP11 correct use of symbols MP12 correctly labelled and complete flowlines</p>	8

Question	Answer	Marks																																				
7(a)	<p>Majority of candidates managed to score well on this question.</p> <p>Two marks One mark for Y, Z, T and no other parts to the expression One mark for AND and AND in the correct positions</p> <p>$X = (Y \text{ AND } Z) \text{ AND } T \quad // \quad Y \text{ AND } Z \text{ AND } T \quad // \quad Y.Z.T$ // allow YZT // Y=1 AND Z= 1 AND T=1</p>	2																																				
(b)(i)	<p>The majority of candidates managed to draw meaningful logic circuits thereby demonstrating high levels of competency on the learning objectives being examined.</p> <p>Two marks One mark for each AND gate (correct shape, sequence and input/out). Or Accept a single 3 input AND gate for two marks</p>	2																																				
(b) (ii)	<p>There was a typo that could potentially confuse some candidates on this section of the question. As a result a special marking approach was employed so as not to disadvantage any candidate.</p> <p>One mark correct headings, One mark correct inputs One mark correct outputs</p> <table border="1"> <thead> <tr> <th>Y</th> <th>Z</th> <th>T</th> <th>X</th> </tr> </thead> <tbody> <tr><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td><td>1</td><td>0</td></tr> <tr><td>0</td><td>1</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>1</td><td>1</td><td>0</td></tr> <tr><td>1</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>1</td><td>0</td><td>1</td><td>0</td></tr> <tr><td>1</td><td>1</td><td>0</td><td>0</td></tr> <tr><td>1</td><td>1</td><td>1</td><td>1</td></tr> </tbody> </table>	Y	Z	T	X	0	0	0	0	0	0	1	0	0	1	0	0	0	1	1	0	1	0	0	0	1	0	1	0	1	1	0	0	1	1	1	1	3
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