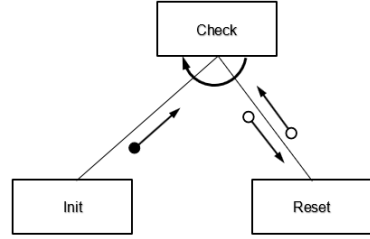


1(a)	Example value	Explanation	Variable name	Data type
	"Fruit"	a category of stock that is sold in the shop	Category	STRING
	20/02/2025	when an item was sold	DateSold	DATE
	12.67	the cost of an item	(Item) Cost/Price	REAL
	TRUE	to indicate if an item is in stock	(Item) InStock	BOOLEAN
Mark as follows: 1 mark per row for each variable name and data type				
1(b)	Pseudocode extract	Assignment	Selection	Iteration
	Result ← CalculateTotal()	✓		
	WHILE IsClosed			✓
	REPEAT INPUT Value UNTIL Sales[4] > Value	✓		✓
	IF Sales[Current] <= 150 THEN Discount ← TRUE ENDIF	✓	✓	
	CASE OF Option		✓	
Mark as follows: One mark for each correct row				
1(c)	Decomposition involves: MP1 Breaking down a problem into sub problems MP2 In order to explain / understand the process/task of how a (stock control) can be managed in more detail MP3 Leading to the concept of the program designed as a series of modules / procedures / functions // or by example of different stock control modules MP4 Makes the program easier to test / debug Max 3 Max 2 if no mention of stock control			

7(a)	- Customer ID – to reference the other customer details - Email address – to send the email - Name – to personalise the email - Date of last visit – to select which customers should receive an email - Unique voucher code (or method of code generation) – to include in the email Mark as follows: One mark per item and justification Max 3 marks
7(b)	Abstraction
7(c)	MP1 Data structures // data dictionary // identifier table(s) // validation rules MP2 Data-flow diagram // state-transition diagram MP3 User interface // Format for the email MP4 Testing method / Test plan / Test data / Trace tables MP5 Choice of email protocol to be used // Programming language to be used // Development environment MP6 Use of library routines // program to send the email Max 3 marks
7(d)	 MP1 Three boxes correctly labelled and correct hierarchy MP2 Parameter and return values MP3 Iteration arrow

7(a)	One mark per answer: MP1 Analysis MP2 Named document, examples include: - A <u>requirement specification</u> - Definition of System Objectives - List of problems with existing system - Survey results - Feasibility study - Interview notes Max 2 marks
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7(b)	One mark for name and use Mark as follows: Examples include: Sub-module: <code>ScanCard()</code> / <code>GetID()</code> Use: Read the barcode from the loyalty card / Get the customer ID from the barcode Sub-module: <code>GetPoints()</code> Use: Get the number of points the customer has Sub-module: <code>ExchangePoints()</code> / <code>UpdateCard()</code> Use: Reduce the number of loyalty points Sub-module: <code>GetDiscount()</code> / <code>CalculateDiscount()</code> Use: Calculate the discount Sub-module: <code>CalculatePoints()</code> Use: Calculate points (following a purchase) Sub-module: <code>UpdatePoints()</code> Use: Update total points a customer has (following a purchase) Sub-module: <code>ShowDiscount()</code> Use: Display the discount Max 4 marks
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7(a)(i)	To make the solution easier to design / implement / solve
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7(a)(ii)	One mark per item and justification Item: mobile phone number Justification: to send the text message Item: name Justification: to personalise the text message Item: exercise interest Justification: to determine whether this member would be interested
7(a)(iii)	Examples include: • Add a member to a list of those interested in the new class • Remove the member from future SMS messages • Read/process Message • Identify who from One mark for each. Max 2 marks
7(b)(i)	Means that <code>Update</code> calls (one of) either <code>Sub-A</code>, <code>Sub-B</code> or <code>Sub-C</code> One mark for each point: • reference to selection / decision / if • naming all four modules correctly
7(b)(ii)	<u>PROCEDURE Sub-A</u> (<u>Name : STRING</u>, BYREF P2 : BOOLEAN) <u>FUNCTION Sub-B</u> (P1 : REAL) RETURNS REAL One mark per underlined part in each case

7(a)	Examples include: Module: <code>IdentifyMember()</code> Use: Identifies a club member who has expressed an interest in a given class Module: <code>GetMemberPhoneNumber()</code> Use: Gets the mobile phone number of a member Module: <code>CreateMessage()</code> Use: Generates a text message to a member Module: <code>SendMessage()</code> Use: Sends a text message to a member in the waiting list One mark for name and use Note: max 3 marks																								
7(b)(i)	<table><tr><th>Input</th><th>Output</th><th>Next state</th></tr><tr><td></td><td></td><td>S1</td></tr><tr><td>Input-A</td><td>none</td><td>S3</td></tr><tr><td>Input-A</td><td>Output-W</td><td>S3</td></tr><tr><td>Input-B</td><td>none</td><td>S2</td></tr><tr><td>Input-B</td><td>none</td><td>S5</td></tr><tr><td>Input-A</td><td>none</td><td>S2</td></tr><tr><td>Input-A</td><td>Output-X</td><td>S4</td></tr></table> One mark per row 3 to 7	Input	Output	Next state			S1	Input-A	none	S3	Input-A	Output-W	S3	Input-B	none	S2	Input-B	none	S5	Input-A	none	S2	Input-A	Output-X	S4
Input	Output	Next state																							
		S1																							
Input-A	none	S3																							
Input-A	Output-W	S3																							
Input-B	none	S2																							
Input-B	none	S5																							
Input-A	none	S2																							
Input-A	Output-X	S4																							
7(b)(ii)	Input-B, Input-A																								