

QUESTION 1.



3	(a) (i)	enumerated	1
	(ii)	record	1
	(iii)	MyMonthOfBirth $\leftarrow$ DateOfBirth.ThisMonth	1
	(b) (i)	<pre> TYPE LocationRainfall DECLARE LocationName : STRING DECLARE LocationHeight : INTEGER DECLARE TotalMonthlyRainfall : <u>ARRAY[1..12]</u> OF REAL ENDTYPE </pre>	1 1 1 1 + 1
	(ii)	- no need to re-sort data every time new data is added - only a small file so searching will require little processing - new records can easily be appended	1 1 1 [max 2]
			Total: 10
4	(a) (i)		

QUESTION 2.



4 (a)	File organisation method serial sequential random File access method direct sequential <pre> graph LR subgraph "File organisation method" serial[serial] sequential[sequential] random[random] end subgraph "File access method" direct[direct] sequential2[sequential] end serial --> direct sequential --> direct sequential --> sequential2 random --> sequential2 </pre>	1 2 1
(b) (i)	Sequential As all customers get statement ... // high hit rate Suitable for batch processing of the records // the records will be processed one after the other File organised using customer's unique ID (as primary key field) // Serial As all customers get statement ... // high hit rate Suitable for batch processing of the records // the records will be processed one after the other Order not important	1 1 1 1 1 1 1 1 Max 3
(ii)	Random Real-time transaction processing Requires fastest access to data No need to search through records	1 1 1 1 Max 3

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(iii)	Serial Each new record is appended Transactions are recorded in chronological order File re-organisation not required for each new record // no need for the
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QUESTION 3.



Question	Answer	Marks
4(a)	File organisation method random serial sequential File access method sequential direct 1 mark for random correct 1 mark for serial correct 2 marks for sequential correct (1 per correct line)	4
4(b)(i)	File A: Serial Meter readings are submitted over time // added to the end of file Stored chronologically 1 1 1	3
4(b)(ii)	File B: Sequential Any two points from: Each customer has a unique account number Sorted on Account number High hit rate // Suitable for batch processing monthly statements 1 1 1 1	3
4(b)(iii)	File C: Random Login without waiting // Random organisation allows fastest direct access to required record Low hit rate // Suitable for access to individual records 1 1 1	3

QUESTION 4.



Question	Answer	
5(a)	1 mark per bullet point to max 2 - Monitoring only gathers information but control systems also perform actions - Output in a control system can affect the input - There is no feedback in a monitoring system // a control system relies on feedback - Example of monitoring applied to the weather station	
5(b)(i)	1 mark per bullet point to max 2 - So the readings are stored in chronological order - Easy to add / append each new reading to the end of the file // no further processing is required - Allows the readings to be read in the order that they were taken - Readings do not need to be given further identification as to date / time // no key field needs to be added	2
5(b)(ii)	1 mark per bullet point max 2 - Earliest temperature reading is accessed first - and each successive temperature reading is read (in date / time order) - until the final reading has been accessed	2
5(b)(iii)	1 mark for Random 1 mark per bullet point for description to max 3 - Record locations are calculated ... using a hashing algorithm on a key field - If a record cannot be stored / found at that location ... then subsequent locations are searched // closed hash ... or an overflow area is searched // open hash	4

Question	Answer	Marks