

1.4 DATA TYPES & STRUCTURES · 1.4.2

Arrays, tuples & records — Mark scheme

30 marks · spec 1.4.2(a)

AO key: AO1 = knowledge · AO2 = application. Accept any valid alternative pseudocode/syntax. Do not award the same point twice.

Q	ANSWER	AO	MARKS
1(a)	An ordered collection of elements of the same data type (1) ; accessed by an index, usually a fixed size (1). (2)	AO1	2
1(b)	Correct identifier and 2-D declaration (1) ; correct dimensions 6×4 (1) . e.g. <code>array seats[6, 4]</code> (accept <code>seats[6][4]</code> / language-specific). (2)	AO2	2
1(c)	<code>seats[3][1]</code> (or <code>seats[3, 1]</code>). (1)	AO2	1
1(d)	0. (1)	AO1	1

Q	ANSWER	AO	MARKS
2(a)	A record. (1)	AO2	1
2(b)	A record can store fields of different data types (1) ; an array would require all the elements to be the same type, which name/age/fee are not (1). (2)	AO2	2
2(c)	Correct record header/footer (1) ; name : string (1) ; age : integer (1) ; fee : real (1) . e.g. <pre>record Member name : string age : integer fee : real endrecord .</pre> (4)	AO2	4

Q	ANSWER	AO	MARKS
3(a)	Any one developed, max 2: an array is a fixed size (1) whereas a list is dynamic / can grow and shrink (1) ; OR an array holds one data type (1) whereas a list can hold mixed types (1). (2)	AO1	2
3(b)	A tuple is immutable (cannot be changed after creation); a list is mutable. (1)	AO1	1
3(c)	Any one: storing fixed values that must not change, e.g. a coordinate / constant set of options. (1)	AO2	1
3(d)	1 mark each, max 2: append · remove · insert · pop · index · length. (2)	AO1	2

Q	ANSWER	AO	MARKS
4(a)	Initialise a total to 0 (1); loop the column index 0 to 3 adding sales[0][col] (1); print the total (1). e.g. <pre>total = 0 for col = 0 to 3 total = total + sales[0][col] next col print(total) . (3)</pre>	AO2	3
4(b)	Keep the chosen column index fixed (1); loop the row index instead (0 to 2), adding sales[row][col] (1). (2)	AO2	2

Q	ANSWER	AO	MARKS
5(a)	A (multi-dimensional) array (1); all values are the same data type (a temperature) and the size is known/fixed, so an array indexed by day and hour fits (1). (2)	AO2	2
5(b)	A tuple (1); it is immutable, so the fixed coordinate cannot be accidentally changed (1). (2)	AO2	2
5(c)	A row has several fields of different data types (like the columns of the table) (1); a record stores exactly these named fields together as one item (1). (2)	AO2	2

Total for paper: 30 marks