1(a). Heath is researching how long, to the nearest minute, each student in his class spends playing computer games in one week (Monday to Friday). He is storing the data in a 2D array.

Fig. 2 shows part of the array, with 4 students.

Fig. 2

		Students			
		0	**1**	**2**	**3**
Days of the week	**0**	60	30	45	0
	1	180	60	0	60
	2	200	30	0	20
	3	60	10	15	15
	4	100	35	30	45

For example, student 1, on Monday (day 0), played 30 minutes of computer games.

Explain why Heath is using an array to store the data.

[2]

(b). i. Identify a data type that could be used to store the number of minutes in this array.

ii. State why this data type is the most appropriate.

(c). Heath wants to output the number of minutes student 3 played computer games on Wednesday (day 2). He writes the code:

```
print (hoursPlayed[3,2])
```

The output is 20.

i. Write the code to output the number of minutes student 0 played computer games on Wednesday.

ii. State the output if Heath runs the code:

```
print (hoursPlayed[2,1])
```

iii. State the output if Heath runs the code:

```
print (hoursPlayed[3,1] + hoursPlayed[3,2])
```

iv. Write an algorithm to output the total number of minutes student 0 played computer games from Monday (day 0) to Friday (day 4).

(d). Heath has the day of the week stored as a number e.g. 0 = Monday, 1 = Tuesday.

Write a sub-program that takes the number as a parameter and returns the day of the week as a string.

[5]

(e). Heath needs to work out the average number of minutes spent playing computer games each day for the class, which contains 30 students. Write an algorithm to output the average number of minutes the whole class spends playing computer games each day.

[8]

END OF QUESTION paper

Mark scheme

Question			Answer/Indicative content	Marks	Guidance
1	a		● Allows multiple items of data to be stored … ● under one identifier / name ● Can store a table structure ● Reduces need for multiple variables	2	1 mark for each bullet to a maximum of 2.
	b	i	Integer	1	Any data type that stores a whole number only
		ii	It is a whole number / no decimals / to the nearest minute.	1	
	c	i	print (hoursPlayed[0,2])	1	Correct Answer Only
		ii		1	Correct Answer Only
		iii	80	1	Correct Answer Only
		iv	● Adding all correct elements ● Outputting correctly ● Using a loop e.g. total = 0 for x = 0 to 4 total = total + hoursPlayed[0,x] next x print (total)	3	1 mark per bullet to a maximum of 3. If used, a flowchart should represent the bulleted steps the answer column
	d		● Appropriate declaration of a function that takes day number as parameter and returns day ● Use of selection (if / switch) ● Appropriate comparison ● Correct identification of each day ● Case default e.g. function returnDay(dayNo As String) As String switch dayNo case 0: returnDay = “Monday” case 1: returnDay = “Tuesday” case 2: returnDay = “Wednesday” case 3: returnDay = “Thursday” case 4: returnDay = “Friday” case default: returnDay = “Invalid” endswitch endfunction	5	1 mark per bullet to a maximum of 5. If used, a flowchart should represent the bulleted steps the answer column.
	e		● Loop 0 to 29 ● Loop 0 to 4 ● Accessing hoursplayed[x,y] ● Addition of hoursplayed[x,y] to total ● Calculating average correctly outside of loops ● Outputting the results e.g. total = 0 for x = 0 to 29 for y = 0 to 4 Total = total + hoursPlayed[x,y] next y	6	Accept any type of average calculation (mean, median, mode). If used, a flowchart should represent the bulleted steps the answer column.

			nextx average = total / (30*5) print (average)		
			Total	**23**	