Mark Scheme (Results)

November 2021

Pearson Edexcel GCSE
In Computer Science (1CP1/02)
Paper 2: Application of Computational Thinking

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question	Answer	Additional Guidance	Mark
1(a)(i)	Any two from • dateOfBirth / Date of birth / DOB (1) • membershipType (1) • gender (1) • parent/guardian (if under 16) (1) • address (1)	• Accept any equivalent names that are sensible in the context • Accept variable names with spaces	**2**

Question	Answer	Additional Guidance	Mark
1(b)	Any one from • Input – membership number (1) • Process – check availability (1) • Output – cost of booking / cost (1)	• Accept sensible alternative wording.	**3**

Question	Answer	Additional Guidance	Mark
1(c)	• (years x discount rate) (1) • Adjusted fee / 12 (1) Examples: • (432 – (432 * (yrs. x 0.05))) / 12 • (fullFee – (fullFee * (numYears * 0.05))) / 12 • (membership – (membership * (Years * discount))) / 12	• Ensure that expression follows the BIDMAS rules of precedence	**2**

Question	Answer	Additional Guidance	Mark
2(a)	Selection (1)		**1**

Question	Answer	Additional Guidance	Mark
2(b)	One mark for each output in the correct cell		**3**

Inputs	Output
(month = 7)	Peak rates apply (1)
(month = 12) AND (time = 19:00)	Standard rates apply (1)
(month = 4) AND (day =6)	Peak weekend rates apply (1)

Question	Answer	Additional Guidance	Mark
2(c)	One mark for month (3,4,9 or 10) (1) One mark for day <= 5 (1) One mark for time (not between 17 : 00 and 20 : 00) (1) Example month = 10 AND day = 4 AND time = 12:00		**3**

Question	Answer	Additional Guidance	Mark
3(a)	Line 4 – FUNCTION (1) ……pMass , pHeight (2). One parameter (1) Line 22 – mass , height (2). One variable (1) Matching order (parameters with variables) (1)	Ignore case and spacing	**6**

Question	Answer	Additional Guidance	Mark
3(b)(i)	Setting a count controlled loop (1) Setting a loop that executes for each value in the attendance array (1)	Accept iteration	**1**

Question	Answer	Additional Guidance	Mark
3(b)(ii)	<table><tr><th>count</th><th>total</th><th>mean</th><th>DISPLAY</th></tr><tr><td>0</td><td>0</td><td>0</td><td></td></tr><tr><td>1</td><td>25</td><td></td><td>25</td></tr><tr><td>2</td><td>40</td><td></td><td>40</td></tr><tr><td>3</td><td>65</td><td></td><td>65</td></tr><tr><td>4</td><td>85</td><td></td><td>85</td></tr><tr><td>5</td><td>100</td><td></td><td>100</td></tr><tr><td></td><td></td><td>20</td><td>20</td></tr></table> Initialisation (1) Count, totals and display from loop, all correct (3) (1 per correct column) mean correct (1) display of mean correct (1)		**6**

Question Number	Answer	Additional Guidance	Mark
4(a)			**4**

Data element	Example	Datatype
ID Reference	26_SMJ_C_3	String
Surname	SMITH	String
Initial	J	Character
Telephone	08756 554221	String
Qualification type	H & F Certificate	String
Qualification Level	3	Integer
Hourly rate (£)	55.00	Real

Character / char (1)
Integer (1)
Real / Float / Decimal (1)
Example of correct use of String (1)

Question	Answer	Additional Guidance	Mark
4(b)(i)	Validation Validation is required to make sure any input data is logical / rational / reasonable / complete / within acceptable limits. (1) It is needed to reduce / minimise the number of errors in the data input (1) by checking the input data against a given set of validation rules. (1)		**2**
4(b)(ii)	Any two from: Range Check (1) used when working with numbers, lets appropriate limits to be set (1) Type Check (1) a way to confirm that the correct data type is entered. (1) Length Check (1) used to make sure that the correct number of characters are entered (1) . Lookup (1) – can be when only a limited list of values is valid / improves accuracy because it lessens the risk of spelling mistakes. (1) Format / Pattern / pattern-matching check (1) compares data that is entered to a preassigned template / sequence. (1) Presence Check (1) this kind of check makes sure that an essential or required field cannot be left blank / must be filled in. (1)		**4**

Question Number	Answer	Additional Guidance	Mark
5(a)(i)	Logic error (1)		
5(a)(ii)	IF arrayToSort[index,2] < arrayToSort[index + 1,2] THEN Correct relational operator (1)		**2**

Question Number	Answer	Additional Guidance	Mark
5(b)	2 D array / array of records (1)	Do not accept array without dimension	**1**

Question Number	Answer	Additional Guidance	Mark
5(c)(i)	An explanation such as: Change the outer loop from a count controlled loop (1) to be condition controlled (WHILE, / REPEAT) (1) A local variable / flag could then be used to control the sort. (1) The flag could be set to FALSE in the inner loop when no swaps are made. (1) The flag could then be used in the outer loop to stop the sort and end the procedure. (1) Alternative After every iteration the lowest value will be at the end of the array. (1). The next iteration need not include already sorted elements (1). Therefore an improvement would be to restrict the inner loop to avoid already sorted values (1) by decrementing the loop counter (1).		**4**

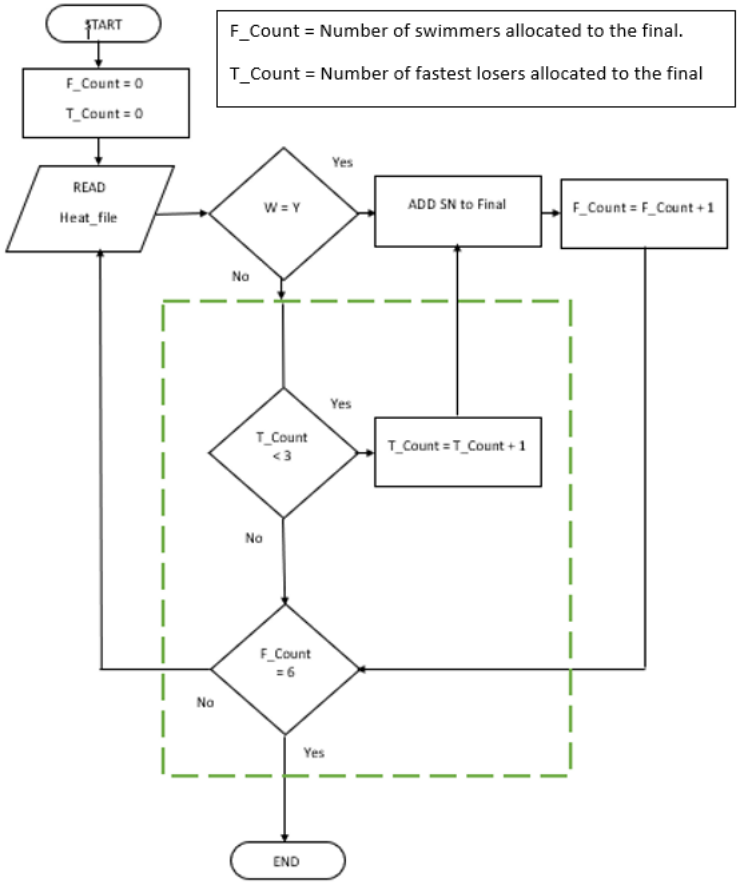
Question Number	Answer	Additional Guidance	Mark
5(c)(ii)	Use of comments (1) Use of whitespace / blank / separating lines (1)		**2**

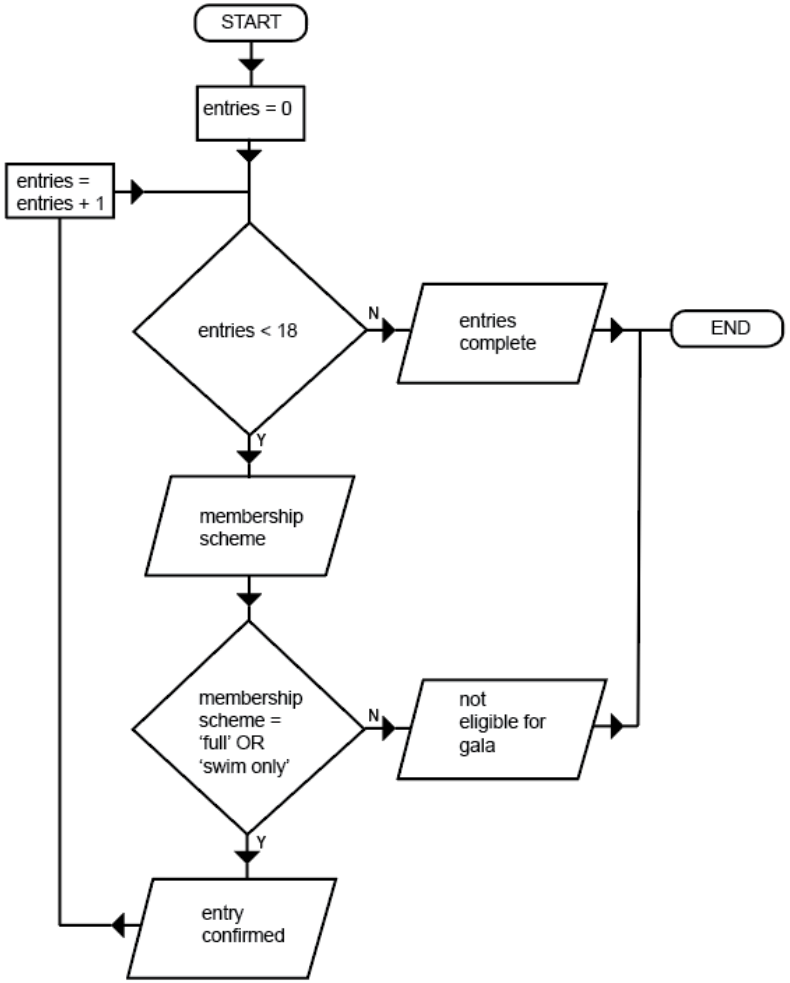
Question	Answer	Additional Guidance	Mark

6(a)	`IF (aTemp > wTemp + 2) OR (humidity > 70)`
	`  SET AC TO ON`
	`ELSE`
	`  SET AC TO OFF`
	`END IF`
	
	aTemp > wTemp +2 (1)
	Correct value for humidity (1)
	Correct ON and OFF (1)
	Correct construct and structure IF / ELSE / END IF (1)
		• Do not penalise for missing or incorrect use of brackets.
		• Accept solution based on range of wTemp
			4

Question	Answer	Additional Guidance	Mark
6(b)	Indicative content wTemp AND NOT aTemp OR NOT humidity / wTemp AND (NOT (aTemp OR humidity)). WTemp TRUE (1) Correct use of AND NOT (1) Correct use of OR NOT (1)		**3**

Question	Answer	Additional Guidance	Mark
7	``` Activate starter / sound horn and lights For each lane Activate automatic timer Check for false start / input from pressure sensor. If yes then sound recall, reset timer and repeat If no check for input from 25m touch pad if zero input disqualify check for input from 50m touch pad stop timer and record time. ``` Start race / start timer (1) Check for false start / reference to pressure sensor (1) Activate recall with suitable output (1) Check for input from sensor at 25m / reference to disqualify (1) Check for input from sensor at 50m / finish (1) Save result / record time (1)	• Do not penalise syntax	**6**

Question Number	Answer	Additional Guidance	Mark
8(a)	 Decision T_Count < 3 (1) Decision F_Count = 6 / <6 (1) Example of correct use of decision symbol (1) Example of correct Yes / No (1) Increment T_Count (1) connected to 'ADD SN process (1)		**6**

Question	Answer	Additional Guidance	Mark
8(b)	Indicative content  		**6**

Aspect of Solution	Marks			
	0	1	2	3
Functionality	No rewardable content	There are significant errors in logic, leading to an overall solution that is non-functional	There are minor errors in logic, leading to an overall solution that is not completely functional	There are no errors in logic, leading to an overall solution that is fully functional
Accuracy of notation	No rewardable content	Notation follows a broadly unrecognisable convention that is applied inconsistently, although aspects of it are discernible	Notation follows a recognisable convention which is broadly discernible but is applied inconsistently	Notation follows a recognisable convention and is applied consistently throughout
There is a maximum of 3 marks for functionality. There is a maximum of 3 marks for accuracy of notation. Each row is awarded independently.				

Question	Answer		Mark

9	Indicative content:
	
	`ARRAY scores`
	`SET scores TO [8.9, 9.1, 8.2, 7.8, 8.1]`
	`REAL inFactor`
	
	`SET lowest TO 10.0`
	`SET highest TO 0.0`
	
	`RECEIVE inFactor FROM (REAL) KEYBOARD`
	`SET index TO 0`
	`WHILE (index < length (scores)) DO`
	`    SET total TO total + scores[index]`
	`    IF scores {index} < lowest THEN`
	`        lowest = scores {index}`
	`    ELSE`
	`        IF scores [index] > highest THEN`
	`            highest = scores [index]`
	`        END IF`
	`    END IF`
	`    SET index TO index + 1`
	`END WHILE`
	
	`#calculate dive score`
	`diveScore = ((total - (highest + lowest)) *inFactor`
	`SEND ("Dive score =") & diveScore TO DISPLAY`
		`ARRAY scores`
		`SET scores TO [8.9, 9.1, 8.2, 7.8, 8.1]`
		`REAL inFactor`
		
		`SET lowest TO 10.0`
		`SET highest TO 0.0`
		
		`RECEIVE inFactor FROM (REAL) KEYBOARD`
		`SET index TO 0`
		`FOR EACH score FROM scores DO`
		`    SET total TO total + score`
		`    IF score < lowest THEN`
		`        lowest = score`
		`    ELSE`
		`        IF scores > highest THEN`
		`            highest = score`
		`        END IF`
		`    END IF`
		`    SET index TO index + 1`
		`END FOR EACH`
		
		`#calculate dive score`
		`diveScore = ((total - (highest + lowest)) *inFactor`
		`SEND ("Dive score =") & diveScore TO DISPLAY`
			9

	• Assignment of highest and lowest • Assignment of index • While loop with condition • Calculate total • Selection statement for lowest • Selection statement for highest • Increment index • End loop • Calculate dive score		

Aspect of Solution	Marks			
	0	1	2	3
Functionality	No rewardable content	There are significant errors in logic, leading to an overall solution that is non-functional	There are minor errors in logic, leading to an overall solution that is not completely functional	There are no errors in logic, leading to an overall solution that is fully functional
Accuracy of notation	No rewardable content	Notation follows a broadly unrecognisable convention that is applied inconsistently, although aspects of it are discernible	Notation follows a recognisable convention which is broadly discernible but is applied inconsistently	Notation follows a recognisable convention and is applied consistently throughout
Efficiency, Appropriateness, and Accuracy of Solution	No rewardable content	There are significant errors in the selection and accurate use of appropriate techniques.	Techniques have been selected and used with some accuracy, although the techniques may not be the most appropriate.	Techniques have been selected and used accurately and appropriately throughout to demonstrate an efficient solution.
There is a maximum of 3 marks for functionality. There is a maximum of 3 marks for accuracy of notation. There is a maximum of 3 marks for efficiency, appropriateness, and accuracy of solution. Each row is awarded independently.				