MODULE M PROGRAMMING · M3

Data types and casting: mark scheme

21 marks · OCR J277 spec 2.2.2 (the use of data types: integer, real, Boolean, character and string, casting; choosing suitable data types for data in a given scenario; data types may be temporarily changed through casting, and where this may be useful), with 2.2.1 (input, output, assignment) for Q2 and Q5

How to use. 1 mark per bullet up to the Max shown. **/** separates alternative words; **//** separates alternative answers for the same mark. Words in (brackets) are not needed for the mark. **...** at the start of a bullet means it depends on the bullet before it. In code answers, ignore capitals and minor syntax slips; repeated slips are penalised once, then follow through. Credit any other valid answer.

QUESTION	ANSWER	MARKS	GUIDANCE
1(a) J277 2.2.2	Number of whole hours: integer Price per hour: real Helmet included: Boolean Frame size code: character / char	**4**	1 mark per correct row. Accept: int; float for real; bool for Boolean. Frame size: also allow string (a single letter can be stored as a string). Do not accept: number / numeric / decimal / text / letter / yes-no on their own; currency for real.
1(b) J277 2.2.2	It starts with a 0 / leading zero, which would be lost / removed if stored as an integer It contains a space (which an integer cannot hold) No calculations / arithmetic are done on a phone number It may contain other characters, e.g. + or brackets (in other phone numbers)	**2**	Max 2. Any two points. Do not accept: "it is not a number" alone; "it is easier / more efficient" alone; "a string can store letters" without linking to this phone number. Credit any other valid answer.
2(a) J277 2.2.2 J277 2.2.1	String	**1**	Accept: str. Do not accept text / characters. Do not accept integer or real: `input()` returns a string until it is cast.
2(b) J277 2.2.2	Changing / converting a value / variable from one data type to another (temporarily)	**1**	Do not accept an example on its own (e.g. 'changing a string to an integer'): it must say one data type to another. Do not accept "changing a variable" or "changing the value" alone (no mention of data type).

QUESTION	ANSWER	MARKS	GUIDANCE
2(c) J277 2.2.2	`cost = int(minutes) * 0.2`	**1**	Accept `float(minutes)` or `real(minutes)` in place of `int(minutes)`. Accept the cast applied in a separate line before the calculation, as long as line 02's calculation then works. Do not accept `str(minutes)` or casting the result instead, e.g. `int(minutes * 0.2)`.
2(d) J277 2.2.2	`print("Cost in pounds: " + str(cost))`	**1**	The cost must be cast to a string with `str()`. The message wording may differ. Do not accept `int(cost)` or `float(cost)` (still a number joined to a string).
3 J277 2.2.2	`int("15") + 5`: 20 `"15" + "5"`: "155" `str(9) + "0"`: "90" `float("1.5") * 2`: 3.0	**4**	1 mark per correct row. Row 1: 20 (not "20" and not "155"). Rows 2 and 3: allow without speech marks (155, 90). Do not accept 20 for row 2 or 9 for row 3. Row 4: accept 3 or 3.00.
4 J277 2.2.2 J277 2.2.1	`total / 4`: real (the value is 2.5) `total MOD 4`: integer (the value is 2) `total >= 10`: Boolean (the value is True)	**3**	1 mark per correct row. Accept float for real, int for integer, bool for Boolean. Do not accept the value instead of the data type (2.5, 2, True score 0).

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	Input the weight and store it in a variable
	Cast / convert the weight to real using `float()` / `real()` or the language's equivalent (e.g. `Double.parseDouble`, `CDbl`, `Convert.ToDouble`)
	Calculate weight × 2.40 using the cast value
	Output the cost with a suitable message ... with the cost cast to a string if + is used in ERL / Python (allow no cast in languages that convert automatically, e.g. Java, C#)
	Example answer (ERL):
	`weight = float(input("Enter parcel weight in kg"))`
	`cost = weight * 2.40`
	`print("Postage cost: " + str(cost))`
		4	1 mark per bullet, max 4.
			Casting may be on the input line or on a separate line.
			Do not award the cast mark for `int()` (it would lose the decimal part, e.g. 3.5) or for casting the cost instead of the weight.
			Calculation: accept 2.4; accept the calculation done inside the output statement. Do not accept × or x as the multiplication operator in code.
			Output: a comma between the message and the cost is allowed (e.g. Python `print("Cost:", cost)`).
			Do not award the output mark if the variable name is inside the speech marks.
			A prompt for the input is not required. Any valid high-level language is accepted.

Total: 21 marks