MODULE P LANGUAGES AND IDES · P3

Translators: compilers and interpreters: mark scheme

21 marks · OCR J277 spec 2.5.1 (purpose of translators; characteristics, benefits and drawbacks of a compiler and an interpreter)

How to use. 1 mark per bullet up to the Max shown. **/** separates alternative answers. Words in (brackets) are not needed for the mark. "..." means the mark depends on the point before it. Credit any other valid answer at J277 level. Assemblers are not required for J277: give no credit for them, but do not penalise them if the rest is correct.

QUESTION	ANSWER	MARKS	GUIDANCE
1(a) J277 2.5.1	To convert / translate source code / program code / high-level (or low-level) code into machine code / binary / object code	**1**	Accept: so the code can be executed / run by the CPU / computer. Do not accept "converts it into a language the computer understands" with no idea of machine code / execution, or "translates English into code".
1(b) J277 2.5.1	The CPU can only execute / understand machine code / binary (instructions) High-level code uses English-like statements / is not machine code ... ... so (the CPU) cannot execute it directly The translator converts the high-level code into machine code (so it can be executed)	**2**	Max 2. Credit any other valid reason why the high-level code cannot be run as it is.
2(a) J277 2.5.1	Translates the whole program before any of it is run: Compiler Must be on the computer every time the program is run: Interpreter Converts source code written in a high-level language into machine code: Both Produces a file that can be run without the original source code: Compiler Runs each line straight after translating it: Interpreter	**5**	1 mark per correct row. More than one tick in a row: 0 for that row.

QUESTION	ANSWER	MARKS	GUIDANCE
3(a) J277 2.5.1	Identification: compiler (1) Justification, max 2: It produces an executable file ... ... which can be copied onto all (400) machines / run on the machines The source code is not given out / the machines only get the executable ... ... so other businesses cannot see / copy / change the source code The machines do not need a translator / compiler installed to run the program The program is translated only once / does not need translating each time it runs (on the machines) The compiled program runs / executes faster (on the machines) than an interpreted version	**3**	Justification marks only if compiler is identified. "It is faster" with no comparison or reason: NE. Accept "runs faster than if it were interpreted". Do not accept "it is more secure" alone.
3(b) J277 2.5.1	The (whole) program / source code must be compiled again / recompiled (after the change) A new executable file is produced ... ... which must be copied / installed onto (each of) the ticket machines	**2**	Max 2. Do not accept "only the changed line is compiled".
4(a) J277 2.5.1	Lines 01 and 02 are translated and run / "Stock check started" is output and the number of boxes is input (Translation and) running stops at line 03 / when the first error is reached The error on line 03 is reported (with its line number) The error on line 06 is not reported / found (yet) / is only found once line 03 is fixed and the program runs again	**3**	Max 3. Do not accept "both errors are reported" or "nothing is output".
4(b) J277 2.5.1	The whole program is translated / checked before any of it is run Both errors / the errors on lines 03 and 06 are reported ... together / in a list / at the end of translation No executable file is produced The program does not run / nothing is output / no input is asked for	**3**	Max 3. Do not accept "it stops at line 03".
5(a) J277 2.5.1	An interpreter translates each line while the program is running / every time the program is run / each time a line in a loop is run A compiled program has already been translated into machine code (before it is run) ... ... so the CPU only has to execute it / no translating is done while it runs	**2**	Max 2. Accept the reverse argument from either side. Do not accept "compilers are faster" alone.

Total: 21 marks