2.10 Translators and Integrated Development Environments (IDEs): 10-minute Pack

OCR J277 · Calculators not allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 State two features of high-level languages that make them different from low-level languages.

(Total for Question 1 is 2 marks)

2 State two features of low-level languages (such as assembly language or machine code).

(Total for Question 2 is 2 marks)

3 Explain why assembly language uses mnemonics (short text codes such as ADD or JMP) instead of pure binary machine code.

(Total for Question 3 is 3 marks)

4 A company is developing firmware for a low-cost embedded thermostat. The firmware must run as fast as possible on very limited memory, and will be mass-produced and never modified once installed. State which type of translator should be used and give two reasons for your choice.

(Total for Question 4 is 3 marks)

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Mark scheme · 2.10 Translators and Integrated Development Environments (IDEs): 10-minute Pack

Question 1

one valid distinguishing feature, e.g. readable English-like statements; portability across processor architectures; greater abstraction from hardware; one statement can represent several machine-code instructions; higher-level data structures, oe	**B1**
a second, different valid feature, oe	**B1**

Answer: Any two distinct features, e.g. readable English-like statements; portability across processors; greater abstraction from hardware; one statement can represent several machine-code instructions.

Question 2

written in binary (machine code) or using short mnemonics (assembly language) that closely correspond to individual processor instructions, oe	**B1**
tied to a specific type of processor - a program is generally not portable between different processor types without rewriting, oe	**B1**

Answer: Low-level languages closely match individual processor instructions (using binary or mnemonics) and are tied to a specific processor type.

Question 3

mnemonics are short, memorable text abbreviations for machine code operations, oe	**B1**
they are far easier for a programmer to read, write and remember than long strings of binary digits, oe	**B1**
this reduces the chance of a programmer making an error, while each mnemonic still maps directly to one machine instruction, so precise control over the hardware is kept, oe	**B1**

Answer: Mnemonics are short, memorable abbreviations that are much easier to read and write than binary, reducing errors, while each still maps directly to one machine instruction.

Question 4

compiler, cao	**B1**
because compiling produces a standalone executable that runs directly/fast without needing the translator present, which suits a device with very limited memory, oe	**B1**
and because compiling happens once during development, so the slower/more thorough translation process does not affect how fast the finished device runs, oe	**B1**

Answer: A compiler, because it produces a fast, standalone executable that does not need the translator present, and the one-off translation cost does not affect the device's running speed.

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