1. Which are true of low-level programming? Select **all** that apply.
   - ☐ it gives direct access to registers and memory addresses
   - ☐ it is architecture-specific, so it must be rewritten for another processor
   - ☐ it is easy to write and maintain
   - ☐ it offers maximum control and speed and the smallest code

   Tick every correct option.

2. An object combines:
   - ☐ only data fields
   - ☐ only functions
   - ☐ two separate programs
   - ☐ attributes and methods

3. What does opening a file FOR WRITE do to existing contents?
   - ☐ it encrypts them
   - ☐ it leaves them and reads only
   - ☐ it adds to the end
   - ☐ it overwrites them (the file is created/emptied)

4. An exception is:
   - ☐ a comment in the code
   - ☐ a type of variable
   - ☐ a syntax mistake caught at compile time
   - ☐ an error or unexpected condition that occurs while a program runs

5. Given the facts ‘member(ben).‘ and ‘trained(ben, audio).‘, which statement below is a supplied fact?
   - ☐ ‘member(ben).‘
   - ☐ ‘can_borrow(ben, camera).‘
   - ☐ ‘trained(ben, camera).‘

6. Imperative (procedural) programming is based on:
   - ☐ stating facts and rules for an engine to infer
   - ☐ a sequence of commands that change the program’s state
   - ☐ pure functions with no side effects
   - ☐ objects that combine data and methods

7. What does encapsulation buy? Select **all** that apply.
   - ☐ the object can enforce its own rules on every change to its data
   - ☐ the program runs faster
   - ☐ there is only one place to add a new rule, and no way around it
   - ☐ the internal representation can be changed later without breaking outside code

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8. Why does a file search loop use WHILE NOT EOF AND NOT found? Select **all** that apply.
   - ☐ so the file does not need closing
   - ☐ so the loop does not read past the end of the file
   - ☐ so there is a flag to test afterwards to report ”not found”
   - ☐ so the loop stops as soon as the record is found instead of reading the rest

   Tick every correct option.

9. Why use exception handling rather than checking for every error in advance? Select **all** that apply.
   - ☐ some errors cannot be prevented in advance, because conditions change between the check and the action
   - ☐ it makes the program run faster
   - ☐ it separates the normal flow from the error handling
   - ☐ otherwise every operation would need its own IF check, burying the algorithm

   Tick every correct option.

10. In the rule ‘can_borrow(Person, camera) :- member(Person), trained(Person, camera).‘, the comma between the two conditions means _____.

    _____

1. **it gives direct access to registers and memory addresses; it is architecture-specific, so it must be rewritten for another processor; it offers maximum control and speed and the smallest code**

   Control is bought with effort: assembly is slow to write and hard to maintain, which is why it is confined to drivers and firmware.

2. **attributes and methods**

   An object bundles its data (attributes) with the operations (methods) that act on it.

3. **it overwrites them (the file is created/emptied)**

   WRITE creates or overwrites the file. To keep existing contents and add more, use APPEND.

4. **an error or unexpected condition that occurs while a program runs**

   Exceptions are run-time problems (divide by zero, file not found) that handling lets you respond to gracefully.

5. **‘member(ben).‘**

   ‘member(ben).‘ is given directly. The knowledge base does not include camera training for Ben, and ‘can_borrow‘ is a goal that a rule must prove.

6. **a sequence of commands that change the program’s state**

   Imperative code gives step-by-step commands (assignments, loops, calls) that change state.

7. **the object can enforce its own rules on every change to its data; there is only one place to add a new rule, and no way around it; the internal representation can be changed later without breaking outside code**

   Encapsulation is about maintainability and correctness, not speed. Private data with public methods is what makes both possible.

8. **so the loop does not read past the end of the file; so there is a flag to test afterwards to report ”not found”; so the loop stops as soon as the record is found instead of reading the rest**

   Every file must still be closed. The two conditions handle early exit and the end of the file respectively.

9. **some errors cannot be prevented in advance, because conditions change between the check and the action; it separates the normal flow from the error handling; otherwise every operation would need its own IF check, burying the algorithm**

   The benefits are correctness and clarity. Speed is not one of them; handling adds a little overhead, which is worth paying.

10. **AND**

    Both membership and camera training must hold for the same Person.

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