Patt/Patel, Introduction to Computing Systems: From Bits & Gates to C/C++ & Beyond, 3e

Chapter 1

True/False

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1. Today's microprocessor chip usually consists of a more than one processor. (T)

2. Ambiguity is an important reason why one cannot program a computer in English. (T)

3. Fortran is a natural language. (F)

4. COBOL is a mechanical language. (T)

5. It is likely that a program written in a (low level) language for one ISA will also run on a computer having a different ISA. (F)

6. COBOL is a low-level language because its programs provide a very low level of detail into the inner workings the underlying business model that is being programmed. (F)

7. Most ISAs are implemented by more than one very different microarchitecture. (T)

8. Some ISAs are implemented by chips designed by multiple manufacturers. (T)

9. Keyboard, card reader, scanner, and disks are all examples of input devices. (T)

10. Monitor, printer output, and disks are all examples of output devices. (T)

11. It is not possible to increase the accuracy of a value in a digital computer (F)

12. One way to improve an analog computer's accuracy is to use more finely tuned sensors (T)

13. Assembly language programs written for the Mac will run on the Mac after being assembled to the Mac's ISA. They will also execute on the PC, after being assembled to the PC's ISA. (F)

14. English can be used as a high level programming language because with care, one can state instructions precisely. (F)

15. For each ISA there is exactly one microarchitecture which implements that ISA. (F)

Multiple Choice

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1. Which of the following is not a high level language?

a. Fortran

b. C++

c. Assembly language

d. COBOL

Answer: c

2. Which of the following is not an output device?

a. Keyboard

b. Printer

c. Monitor

d. Disk

Answer: a

3. Which of the following is not a natural language?

a. Greek

b. Latin

c. French

d. Fortran

Answer: d

4. An algorithm is a step-by-step procedure, characterized by:

a. finiteness

b. effective computability

c. definiteness

d. all of the above.

Answer: d

5. A program can be translated into the ISA of a processor by means of:

a. a compiler

b. an assembler

c. an interpreter

d. all of the above

Answer: d

6. An analog value can be:

a. a measurement of the resistance of a spring

b. a sequence of four single digit integers

c. a sequence of four 0s and 1s

d. all of the above

Answer: a

7. A computer system contains:

a. a cpu

b. memory

c. at least one output device

d. all of the above

Answer: d

8. The following is an example of an ISA:

a. Power-PC

b. Power bar

c. Power PC 641

d. All of the above

Answer: a

9. The following is an example of a microarchitecture:

a. Alpha 21064

b. Alpha 21164

c. Alpha 21264

d. all of the above.

Answer: d

10. The following is an example of a device technology.

a. NMOS

b. CMOS

c. Gallium Arsenide

d. All of the above

Answer: d

Fill in Blanks

(Note: Blank is indicated by parentheses, which contains the answer)

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1. A more precise term for the mechanism that directs the processing of instructions in the computer and also performs the actual processing is the (central processing unit).

2. A (computer system) consists of a processor, plus memory and various input devices and output devices.

3. There are basically two kinds of computers, (analog) in which the values processed are physical quantities, like actual voltage or distance, and (digital) in which the values processed are discrete and distinct values.

4. (Alan Turing) came up with the idea of a universal computational device.

5. (Natural languages) are languages spoken by people, (mechanical languages) are languages designed for use with a computer.

6. (Ambiguity) makes natural language unsuited for writing computer programs, because the computer would never know which of several meanings the programmer intended.

7. (Algorithms) are step by step procedures, whose steps are definite and effectively computable, and the entire procedure is guaranteed to terminate.

8. If a procedure contains the statement "a pinch of salt," the procedure lacks (definiteness).

9. If a procedure contains a statement that can not be carried out by a computer, the procedure lacks (effective computability).

10. If for some inputs, a procedure never terminates, the procedure lacks (finiteness).

11. Fortran, COBOL, C++ and Java are all examples of (high level languages).

12. It is likely that a program written in a (high level) language for one ISA will also run on a computer having a different ISA.

13. Fortran, COBOL, C++ are known as (high level languages) as opposed to Assembly language, which is a (low level language).

14. It is not likely that a program written in a (low level) language for one ISA will also run on a computer having a different ISA.

15. Addressing modes and data types are elements of the (ISA).

16. (Addressing modes) are used to specify the mechanism that will be used to access an operand from memory or a register.

17. PowerPC, SPARC, and x86 are all examples of (ISAs).

18. A (compiler) is frequently used to translate a program written in a high level language into the ISA of a processor.

19. Intel Pentium IV, IBM PowerPC 750FX and the Motorola MPC 7455 are all examples of (microarchitectures).

20. The microarchitecture of a chip is implemented by (logic circuits).