

I. Multiple-Choice Questions

1. Every computer today is based on the ____B____ model.
a. Intel b. von Neumann c. input/output d. Microsoft
2. A computer stores data as a ____D____ pattern.
a. hexadecimal b. numeric c. unary d. binary
3. A program is comprised of a finite number of ____B____.
a. hard drives b. instructions c. memory cells d. i/o devices
4. A 17th-century computing machine that could perform addition and subtraction was the ____A____.
a. Pascaline b. Jacquard loom
c. Analytical Engine d. Babbage machine
5. The uniform representation for storing data is called ____A____.
a. a bit pattern b. a switch c. text d. ISO
6. Engineering programs are typically designed to process ____D____.
a. text b. pixels c. audio d. numbers
7. A(n) ____C____ is the smallest unit of data that can be stored in a computer.
a. nibble b. integer c. bit d. byte
8. An 8-bit pattern can represent up to ____C____ symbols.
a. 8 b. 128 c. 256 d. 16
9. If the ASCII code for E is 1000101, then the ASCII code for e is ____D____.
a. 1000110 b. 1000111 c. 0000110 d. 1100101
10. In the ____B____ graphic method of representing an image in a computer, the image is decomposed into a combination of curves and lines.
a. bitmap b. vector c. quantized d. binary
11. For an 8-bit allocation, the largest decimal number that can be represented in two's complement form is ____C____.
a. -8 b. -127 c. -128 d. -256
12. You use a bit pattern called a ____A____ to modify another bit pattern.
a. mask b. carry c. float d. byte
13. The ____B____ memory contains a copy of a portion of main memory.
a. CPU b. Cache c. main d. ROM
14. The ____C____ controller is a serial device that connects slow devices such as the keyboard and mouse to the computer.
a. SCSI b. FireWire c. USB d. IDE
15. Defining the users, needs, requirements, and methods is part of the ____A____ phase.

- a. analysis b. design c. implementation d. testing
16. ____B____ is a measure of how tightly two modules are bound to each other.
- a. Modularity b. Coupling c. Interoperability d. Cohesion

II. Fill in the blanks

- Data and programs are stored in memory.
- In the system development process, writing the code is part of the implementation phase.
- The CPU includes a small number of storage buffers that hold data temporarily, called cache.
- Store -40 in a 16-bit memory location using two's complement representation. 111111111011000.
- Store -40 in a 16-bit memory location using one's complement representation. 1111111111010111.
- Store -40 in a 16-bit memory location using sign-and-magnitude representation. 1000000000101000.
- Represent -25 in Excess_127 using an 8-bit allocation. 01100110.
- To unset (clear) a bit in a target bit pattern, set the corresponding mask bit to 0 and use the AND operator.
- The program counter keeps track of the instruction currently being executed.
- The two designs for CPU architecture are CISC and RISC.
- There are two models of software development: waterfall model and incremental model.
- There are two types of software testing: black box testing and white box testing.
- Modularity is the division of a large program into smaller parts that can communicate with each other.

III. Questions

- What are the subsystems of the Neumann computer models?
Arithmetic logic unit Memory Input/output Control unit
- An audio signal is sampled 8000 times per second. Each sample is represented by 256 different levels. How many bits per second are needed to represent this signal?
- Add two numbers in two's complement representation:
 $(-35) + (+20) = (-15)$
- Define the term **overflow**.
- Discuss the differences between PROM, EPROM, and EEPROM.

6. What are the four phases in software development?