**Chapter 13:**

**Instruction sets: addressing modes and formats**

**MULTIPLE CHOICE**

1. The advantage of \_\_\_\_\_\_\_\_\_\_ is that no memory reference other than the instruction fetch is required to obtain the operand.

A. direct addressing B. immediate addressing

C. register addressing D. stack addressing

1. The principal advantage of \_\_\_\_\_\_\_\_\_\_\_ addressing is that it is a very simple form of addressing.

A. displacement B. register

C. stack D. direct

1. \_\_\_\_\_\_\_\_\_\_ has the advantage of large address space, however it has the disadvantage of multiple memory references.

A. Indirect addressing B. Direct addressing

C. Immediate addressing D. Stack addressing

1. The advantages of \_\_\_\_\_\_\_\_\_ addressing are that only a small address field is needed in the instruction and no time-consuming memory references are required.

A. direct B. indirect

C. register D. displacement

1. \_\_\_\_\_\_\_\_\_\_ has the advantage of flexibility, but the disadvantage of complexity.

A. Stack addressing B. Displacement addressing

C. Direct addressing D. Register addressing

1. For \_\_\_\_\_\_\_\_\_, the address field references a main memory address and the referenced register contains a positive displacement from that address.

A. indexing B. base-register addressing

C. relative addressing D. all of the above

1. Indexing performed after the indirection is \_\_\_\_\_\_\_\_\_\_.

A. relative addressing B. autoindexing

C. postindexing D. preindexing

1. For the \_\_\_\_\_\_\_\_\_ mode, the operand is included in the instruction.

A. immediate B. base

C. register D. displacement

1. The only form of addressing for branch instructions is \_\_\_\_\_\_\_\_\_ addressing.

A. register B. relative

C. base D. immediate

1. Which of the following interrelated factors go into determining the use of the addressing bits?

A. number of operands B. number of register sets

C. address range D. all of the above

1. \_\_\_\_\_\_\_\_\_ is a principle by which two variables are independent of each other.

A. Opcode B. Orthogonality

C. Completeness D. Autoindexing

1. The \_\_\_\_\_\_\_\_\_ was designed to provide a powerful and flexible instruction set within the constraints of a 16-bit minicomputer.

A. PDP-1 B. PDP-8

C. PDP-11 D. PDP-10

1. The \_\_\_\_\_\_\_\_\_\_ byte consists of three fields: the Scale field, the Index field and the Base field.

A. SIB B. VAX

C. PDP-11 D. ModR/M

1. All instructions in the ARM architecture are \_\_\_\_\_\_\_\_\_\_ bits long and follow a regular format.

A. 8 B. 16

C. 32 D. 64

1. \_\_\_\_\_\_\_\_\_\_ is a design principle employed in designing the PDP-10 instruction set.

A. Orthogonality B. Completeness

C. Direct addressing D. All of the above

**SHORT ANSWER**

1. The actual mapping to a physical address is a function of the \_\_\_\_\_\_\_\_\_ and is invisible to the programmer.
2. The simplest form of addressing is \_\_\_\_\_\_\_\_\_\_ addressing.
3. Not common on contemporary architectures, \_\_\_\_\_\_\_\_\_\_\_ requires only one memory reference and no special calculation, but provides only a limited address space.
4. Just as register addressing is analogous to direct addressing, \_\_\_\_\_\_\_\_ addressing is analogous to indirect addressing.
5. A very powerful mode of addressing, \_\_\_\_\_\_\_\_\_\_ combines the capabilities of direct addressing and register indirect addressing, requiring that the instruction have two address fields, at least one of which is explicit.
6. \_\_\_\_\_\_\_\_\_\_ is when the increment or decrement of the index register after each reference to it is done automatically as part of the same instruction cycle.
7. Sometimes referred to as a *pushdown list* or *last-in-first-out queue*, a \_\_\_\_\_\_\_\_\_\_ is a linear array of locations.
8. In the \_\_\_\_\_\_\_\_\_\_ mode the instruction includes a displacement to be added to a base register, which may be any of the general-purpose registers.
9. A(n) \_\_\_\_\_\_\_\_\_\_ defines the layout of the bits of an instruction in terms of its constituent fields, must include an opcode and, implicitly or explicitly, zero or more operands.
10. “All instructions should have the ‘natural’ number of operands” and “all operands should have the same generality in specification” are two criteria that were used in designing the \_\_\_\_\_\_\_\_\_\_ instruction format.
11. \_\_\_\_\_\_\_\_\_\_ explicitly specifies which segment register an instruction should use, overriding the default segment-register selection generated by the x86 for that instruction.
12. The \_\_\_\_\_\_\_\_\_ byte specifies whether an operand is in a register or in memory, and if it is in memory, then fields within the byte specify the addressing mode to be used.
13. The \_\_\_\_\_\_\_\_\_\_ instruction set is designed to increase the performance of ARM implementations that use a 16-bit or narrower memory data bus and to allow better code density than provided by the ARM instruction set.
14. Programs written in assembly language are translated into machine language by an \_\_\_\_\_\_\_\_\_.
15. If a programmer wished to program directly in machine language it would be necessary to enter the program as \_\_\_\_\_\_\_\_ data.