

tion is executed, the value of address field is transferred to the program counter (PC). In this type of instruction, control does not return to the main program.

Call subroutine instruction consists of an operation code and an address field which points to the location of beginning of the subroutine. Two operations take place when this instruction is executed.

- The address of the next instruction available in the program counter (return address) is stored in a temporary location so the subroutine knows where to return.
- Control is transferred to the beginning of the subroutine.

A subroutine is a self contained sequence of instructions which performs a given task. Each subroutine ends with a 'return' instruction. When execution of subroutine gets over, control returns to the calling program.

Program interrupt refers to the transfer of program control from a currently running program to a service program as a result of an external or internal generated request. Control returns to the original program after the service program is executed.

Q.24. What is RISC and CISC?

[UP Tech 2004-2005, 2007-2008]

Ans. Reduced Instruction Set Computer (RISC): Computers with less number of instructions with simple constructs so they can be executed in a faster manner. Such instructions do not use memory very often. As it uses simple and faster instructions hence more number of instructions is required to accomplish a task. RISC chips require fewer transistors, which makes them easier to design and cheaper to produce.

Complex Instruction Set Computer (CISC) - A computer with a large number of instructions is known as CISC. Less number of instructions are required to accomplish any task. Examples of CISC are Digital Equipment Corporation VAX computer and the IBM 370 computer.

Q.25. Write the characteristics of RISC and CISC. [UP Tech 2007-2008]

Ans. The main characteristics of RISC are as follows:

- Less number of instructions as compare to CISC.

- There is less number of instruction modes.
- Memory is not accessed very often. Memory is accessed only in LOAD and STORE instructions.
- All operations are performed with the help of registers of the CPU.
- Instruction format is of fixed length.
- Instructions are simple, easy to decode.
- Hard wired rather than micro programmed control.

The main characteristics of CISC are as follows:

- Large number of instructions is used.
- Many addressing modes are there.
- Instruction format is of variable length.
- Instructions are there which manipulate operands in memory.

Q.26. Write the differences between RISC and CISC.

[U.P. Tech., 2004-2005, 2005-2006]

Ans. There are many differences between RISC and CISC which are as follows:

1. CISC is mainly used By Intel and AMD Processors where as RISC is mainly used by Apple.
2. There is large number of instructions in CISC whereas in RISC there are fewer instructions.
3. In CISC instructions are complex where as in RISC instructions are simple.
4. Less number of registers are used in CISC whereas more registers are used in RISC because all operations are done in registers.
5. More number of addressing modes are used in CISC whereas in RISC fewer addressing modes are used.
6. Instructions in CISC access memory much more frequently as compared to RISC.
7. CISC chips are slower than RISC chips when performing instructions,
8. Instruction format is of variable length in CISC whereas instruction format is of fixed length in RISC.
9. Execution of instructions is slower in CISC as compared to RISC.
10. CISC more expensive to make as compared to RISC.