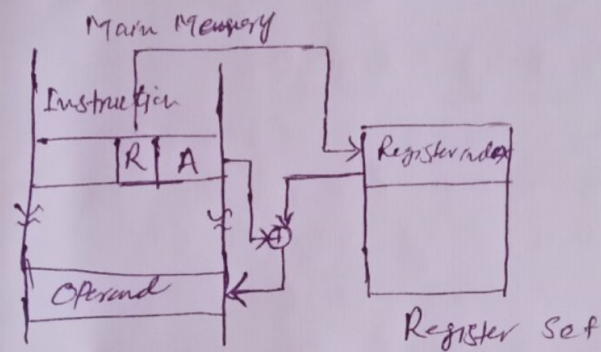


⑥ Indexed Addressing scheme

In this scheme, the operand field of the instruction contains an address and an indexed register, which contains an offset. This addressing scheme is generally used to address the consecutive locations of memory (which may store the elements of an array). The index register is a special CPU register that contains an index value. The contents of the operand field A are taken to be the address of the initial or reference location (or first element of array). The index register specifies the distance between the starting address and address of the operand.



As the index register is used for iterative applications, therefore, the value of index register is incremented or decremented after each reference to it.

The effective address in this scheme is calculated as

$$EA = A + (R)$$

$$D = (EA)$$

⑦ Base Register Addressing:-

In this addressing scheme the content of an instruction specifies base register is added to the displacement field or address field of the instruction.

This is similar to indexed addressing scheme except that the role of address field and register is reversed. In induced addressing mode, address field of the

instruction is fixed and index register value is changed, whereas in base register addressing, the base register is common and address field of the instruction in various instructions is changed.

Effective address in this case will be

$$EA = A + (B)$$

$$D = (EA)$$

The base addressing scheme provides protection of users from one another. No user is allowed to change the contents of the base register.

This addressing scheme is usually employed to relocate the programs in memory.

⑧ Relative Addressing Scheme:-

In this addressing scheme, the register R is the Program Counter (PC) containing the address of current instruction being executed. The operand field A contains the displacement (positive or negative) of an instruction with respect to the current instruction. This addressing scheme has advantages if the memory references are nearer to the current instruction being executed.

Effective address in this case will be

$$EA = A + (PC)$$

$$D = (EA)$$

⑨ Stack Addressing:-

In this addressing scheme, the operand is implied as top of stack. It uses a CPU register called Stack Pointer (SP). The SP points to the top of the stack i.e. to the memory location where the last value was pushed. The operand is found on the top of stack.

