* Draw and explain basic computer instruction formats.
* Draw the block diagram of control unit.
* Memory reference instructions
* Explain instruction formats with its types.
* Instruction cycle
* Write a detailed note on instruction cycle with neat diagrams.
* A computer uses a memory unit with 256K words of 32 bits each. A binary instruction code is stored in one word of memory. The instruction has four parts: an indirect bit, an operation code, a register code part to specify one of 64 registers, and an address part.

How many bits are there in operation code, the register code part, and the address part?

Draw the instruction word format and indicate the number of bits in each part.

How many bits are there in the data and address inputs of the memory?

* Write a brief note on: - Subroutine call and return
* Explain the Common Bus System with its diagram.
* Discuss the phases of Instruction Cycle with flowchart.
* Derive the control gate structure associated with the Address Register (AR) in the basic computer.
* Explain the following instructions:

SPA, SNA, SZA, SZE.

* Explain the basic working principle of the Control Unit of basic computer using diagram.
* Explain the design of Accumulator logic.
* Give the basic computer instruction format and explain Memory reference, Register reference and Input-output instructions.
* Explain the following instructions
  + CLA
  + ISZ
  + INP
* Explain Instruction cycle.
* Write a note on subroutines.
* Explain Direct and Indirect Addressing
* Explain four types of instruction formats
* Draw a block diagram of a Computer’s CPU showing all the basic building blocks such as Program Counter, Accumulator, Address and Data Registers, Instruction Register, Control unit etc. and describe how such an arrangement can work as a computer, if connected properly to Memory, Input / Output etc.
* In an instruction format, there are 16 bits in an instruction word. Bit 0 to 11 convey the address of the memory location for memory related instructions. For non memory instructions these bits convey various register or I/O operations. Bits 12 to 14 show the various basic memory operations such as ADD, AND, LDA etc. Bit 15 shows if the memory is accessed directly or indirectly. For such an instruction format draw block diagram of the control unit of a computer and briefly explain how an instruction will be decoded and executed, by this Control Unit.
* Explain showing a basic block diagram, how the Control Unit of a CPU can be designed using Hardwired Control.
* Explain Program Interrupts. Explain clearly, discussing the role of stack, PSW and return from interrupt instruction, how interrupts are implemented on computers.
* Compare the following.
* Microprogrammed and hardwired control organization.
* Register reference and memory reference instructions.
* What is program interrupt? What happens when it comes? What are the tasks to be performed by service routine?
* Draw and explain the common bus architecture for basic computer.
* Draw and explain the flowchart of Instruction Cycle.
* Explain one, two and three address instructions.