Jaypee University of Engineering & Technology, Guna (M.P.)
Department of Computer Science & Engineering

Course: Computer Organization & Architecture
(B. Tech. IV/VI Sem, Code: CS107/18B11CI414)

Tutorial-7
Topic: CPU instruction/control word format

1. Write down the assembly language program to subtract two numbers, and then convert it into hexadecimal program and binary program. Show what are the contents of AC, PC, and IR (in hexadecimal) after each instruction?

2. The memory unit of a computer has 256K words of 32 bit each. The computer has an instruction format with four fields: an operation code field, a mode field to specify one of the seven modes, a register address field to specify one of the 60 processor registers, and a memory address. Specify the instruction format and the number of bits in each field if the instruction is in one memory word.

3. Given the 16-bit value 1001101011001 1 0 1. What operation must be performed in order to:
   (a) Clear to 0 eight LSBs (b) Set to 1 eight MSBs (c) Complement the middle eight bits

4. A bus-organized CPU similar to fig. 8-2 has 15 registers with 32 bits in each, an ALU, and a destination decoder.
   a. How many multiplexers are there in the A bus, and what is the size of each multiplexer?
   b. How many selection inputs are needed for MUX A and MUX B?
   c. How many inputs and outputs are there in the decoder?
   d. How many inputs and outputs are there in the ALU for data, including input and output carries?
   e. Formulate a control word for the system assuming that the ALU has 35 operations.

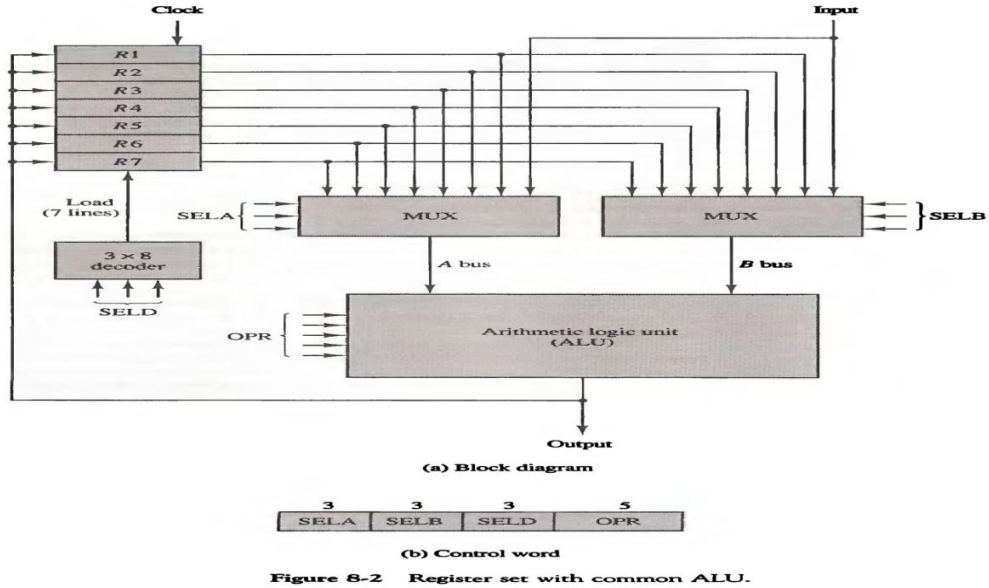

Figure 8-2 Register set with common ALU.