**MODEL QUESTIONS FOR PRACTICAL EXAM**

1. Design and realize a 16- bit parallel adder and associated flags
2. Design and implement an eight-bit parallel adder/subtractor. Design necessary logic circuits for generating ‘overflow flag’ and ‘sign flag’
3. Design and implement a four-bit register file with four registers with two read ports and one write ports
4. Design and implement a four-bit register file that can be connected to a 4 bit ALU
5. Design and realize an eight-bit logic unit
6. Design and realize 4 bit logic unit and associated flags
7. Realize a multiplier circuit to perform multiplication between +6 and +3 with minimum latency
8. Realize a multiplier circuit to perform multiplication between +5 and +4 with minimum hardware complexity
9. Design the write hardware of a register file having eight registers each with capacity of eight bits. Write different data into different registers. (No need to design the read hardware)
10. Design the read hardware of a register file having eight registers each with capacity of eight bits. Write different data into different registers. (No need to design the write hardware)
11. Design and implement a four bit adder/subtractor . Implement necessary hardware to generate zero flag, parity flag, overflow flag and sign flag
12. Design and implement a circuit to perform addition between +222 and +111. Store the result in a register. Realize necessary flag circuits
13. Design and implement a circuit that satisfy the following function table

|  |  |  |  |
| --- | --- | --- | --- |
| Sl No | S1 | S0 | OUTPUT |
| 1 | 0 | 0 | A + B |
| 2 | 0 | 1 | A - B |
| 3 | 1 | 0 | A+1 |
| 4 | 1 | 1 | A -1 |

(Assume A and B are two bit binary data)

1. Design and implement a circuit that satisfy the following function table

|  |  |  |  |
| --- | --- | --- | --- |
| Sl No | S1 | S0 | OUTPUT |
| 1 | 0 | 0 | NOT |
| 2 | 0 | 1 | AND |
| 3 | 1 | 0 | OR |
| 4 | 1 | 1 | XOR |

Implement a circuit by using the above unit to determine NAND operation between two 4 bit data inputs

1. Design and implement a circuit to perform multiplication between 0011 and 0010. Store the result without using an extra register
2. Design and realize a circuit to perform different basic logic operations. By using the circuit perform NOR operation between 0100 and 1010.
3. Design and realize a circuit that can be used to

1)clear the contents of an 8 bit register.

2) complement the contents of an 8 bit register

3) set the selected bits of an 8 bit register