

**2019**

Full Marks - 40

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Subtract 11010 from 10110 by using 2's complement. 2
- b) What is the difference between Half adder and full adder circuit. 2
- c) What is Direct Memory Access ? 2
- d) What do you mean by Page replacement ? 2
2. a) What do you mean by decoders ? Draw the logic diagram of a 3-to-8 line decoder and explain it with the truth table. 8

OR

- b) i) Perform the arithmetic operations  $(+42) + (-13)$  and  $(-42) - (-13)$  in binary using signed 2's complement representation for negative numbers. 4

- ii) Perform the subtraction with the following unsigned binary numbers by taking the 2's complement of the subtrahend. 4

$$* 11010 - 10000 \quad * 1010100 - 1010100$$

3. a) Explain the addressing modes for a basic computer. 8

OR

- b) Explain how the information can be transferred from one register to another and draw the block diagram and timing diagram of register transfer. 8

4. a) What do you mean by pipelining? Explain Arithmetic Pipelining with example. 8

OR

- b) Explain the different types of modes of data transfer from I/O to memory. 8

5. a) Explain the memory hierarchy in a computer system in details with block diagram. 8

OR

- b) Write notes on the following : 4 × 2

i) Direct mapping scheme

ii) Flynn's classification.