

Module-3

- 5 a. Perform the following:
- Convert $(725.25)_{10} = (?)_{10} = (?)_2$
 - Subtract using 2's complement $(4 - 9)_{10}$
 - $(11010.101)_2 = (?)_8 = (?)_{16}$ (06 Marks)
- b. State and prove Demorgan's theorem. (05 Marks)
- c. Simplify the expression and realize using basic gates $\overline{A}\overline{B}\overline{C} + \overline{A}B\overline{C} + A\overline{B}\overline{C} + A\overline{B}C$. (05 Marks)

OR

- 6 a. Convert:
- $(172.625)_{10} = (?)_{16} = (?)_2$
 - $(BDCE)_{16} = (?)_2 = (?)_8$
 - $(10111101.0110)_2 = (?)_{10} = (?)_{16}$ (06 Marks)
- b. Simplify and realize the Boolean expression using two inputs NAND gates only $(A + \overline{B} + C)(\overline{A} + B + C)$. (05 Marks)
- c. Realize the full adder circuit for sum and carry using basic gates, explain the same with truth table. (05 Marks)

Module-4

- 7 a. Explain the operation of NAND and NOR latch with symbol, circuit and truth tube. (08 Marks)
- b. With neat block diagram, describe the architecture of 8051 microcontroller. (08 Marks)

OR

- 8 a. What is flip-flop? Explain clocked R-S flip-flop with diagram and truth table. (08 Marks)
- b. Explain the working principle of microcontroller based stepper motor control system. (08 Marks)

Module-5

- 9 a. What are the basic elements of communication system? Explain with neat block diagram. (06 Marks)
- b. Distinguish between Amplitude Modulation (AM) and Frequency Modulation (FM). (04 Marks)
- c. Explain the construction and the principle of operation of LVDT. (06 Marks)

OR

- 10 a. With relevant waveforms, explain amplitude modulation. (06 Marks)
- b. What is a transducer? Mention four important parameters of an electrical transducer. (04 Marks)
- c. Write short notes on:
- Piezo electric transducer
 - Photo electric transducer. (06 Marks)
