

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER– III EXAMINATION – SUMMER 2026

Subject Code:3131102

Date:19-06-2026

Subject Name:Digital System Design

Time:02:30 PM TO 05:00 PM

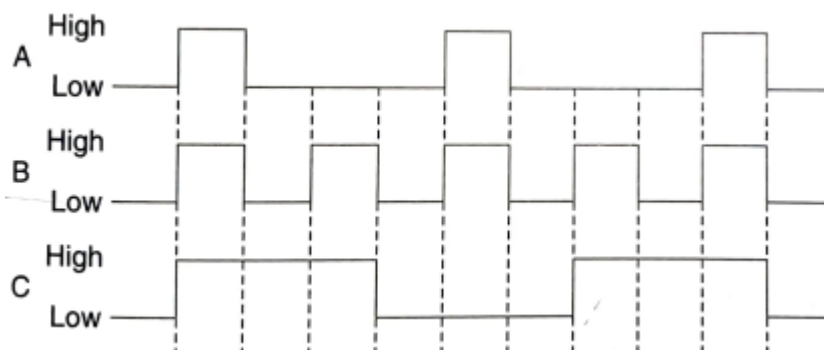
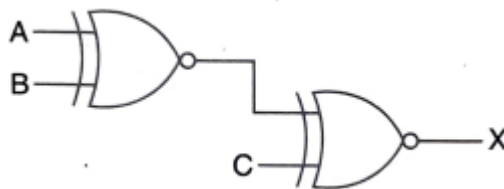
Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

Marks

- Q.1** (a) What do you mean by positional weighted system. Name some positional weighted system. **03**
- (b) Given that $292_{10} = 1204_b$ Than find the value of b. **04**
- (c) What are the characteristic of 2's complement numbers. What are the three methods of obtaining 2's complement of given number. Explain with suitable example. **07**
- Q.2** (a) Write a short note on Gray Codes. **03**
- (b) If the waveforms A, B, C are applied to the gate circuit shown below, determine the output waveform. **04**



- (c) Write a short note on magnitude comparator. **07**
- OR**
- (c) Write a short note on binary full adder and implement the circuit using universal logic. **07**
- Q.3** (a) How do you convert AOI logic to universal logic. **03**
- (b) Reduce using mapping the expression $f = \sum m(0, 1, 2, 3, 5, 8, 9, 10, 12, 13)$ **04**
- (c) Explain working principal of Master Slave flip flop using suitable diagram. **07**

OR

- Q.3** (a) Why do we need to reduce Boolean expression before realization. What is the systematic procedure to reduce the Boolean expression? **03**
(b) Write a Short note on SR flip flop **04**
(c) Explain Quine-McCluskey method for the minimization of Boolean expression. **07**

- Q.4** (a) Write a short note on programmable array logic. **03**
(b) Give comparison of programmable logic device such as PROM, PAL, PLA. **04**
(c) Write a short note on TTL logic families. **07**

OR

- Q.4** (a) Distinguished between combinational and sequential logic circuit. **03**
(b) What are moore and mealy machines? Compare them. **04**
(c) Write a short note on universal shift register. **07**

- Q.5** (a) Write a short note on weighted resistor type D to A converter. **03**
(b) Explain R-2R ladder type D to A converter. **04**
(c) Explain following parameter for D to A conversion. **07**
Resolution, Accuracy, settling time, offset voltage.

OR

- Q.5** (a) What do you mean by test bench in VHDL design. **03**
(b) List and explain the data types used in HDL **04**
(c) Compare data flow ,behavioral and structural modeling. **07**
