

Indian Institute of Information Technology Vadodara
Mid Sem Remote Examination-2021-22
Specialization: B. Tech. (CSE & IT)
Course Code: EC-201 (Digital Logic Design)

Time: 40 Minutes

Date: 12/11/2021

Max. Marks: 50

Read the instructions carefully.

- ≡ Attempt ALL the questions.
- ≡ Take fresh Notebook to write the answers for all sessions in sequential manner.
- ≡ On top of each page, write Institute ID, Name and Signature. Evaluation will not be done for page without the detail.
- ≡ Write each new answer in the new page.
- ≡ Scan the pages and save in pdf format with file name: 202051###_Student name#.pdf.
- ≡ (For example: 201951123_abc_Gn (Section1 or Section2) or ICD Campus.pdf)
- ≡ Upload the file on Google Classroom. No need to send as an email attachment.
- ≡ Keep the Notebook and submit to me on arrival at the Institute

Questions (10 Marks Each)

Q1. Take the last four digits of your roll number. If the digit is ≥ 0 & ≤ 3 consider the logic 0, if digit is ≥ 4 & ≤ 6 consider the X (don't care) condition and if digit is ≥ 7 & ≤ 9 consider logic 1. Find the output of the multiplexer (choose as per the requirement).

Q2. Reduce the expression $f = \sum m(0,2,3,4,5,6)$ using mapping and Take your roll number digits and add them. If the sum is an even number then realize this circuit using the two input NAND gates only else using the basic gates.

Q3. Minimize the expression using K-map

1. $f(a,b,c) = \sum m(0,1,6,7) + \sum d(3,4,5)$
2. $f(a,b,c) = \sum m(0,1,3,5,7,8,9,11,13,15)$

Q4. A circuit has four inputs D,C,B,A encoded in natural binary form where A is the least significant bit. The inputs in the range 0000=0 to 1011=11 represents the months of the year from January (0) to December (11). Input in the range 1100-1111(i.e.12 to 15) cannot occur. The output of the circuit is true if the month represented by the input has 31 days. Otherwise the output is false. The output for inputs in the range 1100 to 1111 is undefined. Draw the truth table to represent the problem and obtain the function F as a Sum of minterm. - Use the Karnaugh map to obtain a simplified expression for the function F. Construct the circuit to implement the function using NOR gates only.

Q5. Take the last digit of your roll number (if zero then take the next non-zero number). Convert the digit into a 4-digit binary number. Take a pair of binary numbers from LSB as an input to the S-R flip flop. Find the next state of the flip flop. Draw the truth table and diagram of the S-R flip flop with rising clock edge.

*****End*****