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**Question Paper Code: 31362**

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Third Semester

Instrumentation and Control Engineering

01UIC302 – DIGITAL LOGIC CIRCUITS AND DESIGN

(Regulation 2013)

Duration: One hour

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

**(Answer any six of the following questions)**

1. The Hexadecimal equivalent of a decimal number 48 is  
(a) 2B                      (b) 2E                      (c) 2F                      (d) F2
2. How many outputs are on a BCD decoder?  
(a) 4                      (b) 16                      (c) 8                      (d) 10
3. What is ROM?  
(a) repeat on memory                      (b) read on memory  
(c) read only memory                      (d) repeat only memory
4. In PROM, we can  
(a) store the data once and read multiple times                      (b) store and erase data once  
(c) store and erase data multiple times                      (d) store once and read once
5. Which type of gate can be used to add two bits?  
(a) Ex-OR                      (b) Ex-NOR                      (c) Ex-NAND                      (d) NOR
6. How many flipflops are required to build a binary counter that counts from 0 to 1023?  
(a) 12                      (b) 20                      (c) 50                      (d) 10

7. The next state variables in asynchronous sequential circuits are called  
 (a) secondary variables (b) excitation variables  
 (c) primary variables (d) short term memory
8. In ASM, the decision box is represented by  
 (a) circle (b) oval (c) diamond (d) rectangle
9. Which of the following logic family has the shortest propagation delay?  
 (a) CMOS (b) NMOS (c) ECL (d) 74Sxx
10. The VHDL is based on the \_\_\_\_\_ library  
 (a) IEE (b) WORK (c) IEEE (d) Standard

PART – B (3 x 8= 24 Marks)

**(Answer any three of the following questions)**

11. Reduce the following using tabulation method and realize the simplified function using only  $F(A, B, C, D) = \sum m(14, 12, 10, 8, 6, 4, 3, 2, 1, 0)$ . (8)
12. Design full adder circuit and full subtractor circuit using logic gates and explain its function using truth table. (8)
13. With a neat diagram explain the working of a master–slave JK flip flop. (8)
14. List and explain the steps used for analyzing an asynchronous sequential circuit. (8)
15. Explain with the aid of a circuit diagram, the operation of a TTL 3-input NAND gate. (8)