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Question Paper Code: 53402

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

Third Semester

Electronics and Communication Engineering

19UEC302 - DIGITAL ELECTRONICS AND DESIGN

(Regulation 2015)

Duration: One hour

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. The 2's complement representation of -17 is CO1- U
(a) 01110 (b) 01111 (c) 11110 (d) 10001
2. The Boolean function $Y=AB+CD$ is to be realized using only 2-input NAND gates. The minimum number of gates required is CO1- U
(a) 2 (b) 3 (c) 4 (d) 5
3. How many data select lines are required for selecting eight inputs? CO2- R
(a) 1 (b) 2 (c) 3 (d) 4
4. The minimum number of 2 to 1 multiplexers requires to realize a 4 to 1 multiplexer is CO2- R
(a) 1 (b) 2 (c) 3 (d) 4
5. How many natural states will there be in a 4-bit ripple counter? CO3- R
(a) 16 (b) 32 (c) 4 (d) 8
6. A shift register that will accept a parallel input or a bidirectional serial load and internal shift features is called as? CO3- R
(a) Tristate (b) End around (c) Universal (d) Conversion
7. Which sequential circuits generate the feedback path due to the cross-coupled connection from output of one gate to the input of another gate? CO4- R
(a) Synchronous (b) Asynchronous (c) Both a & b (d) None of the above

8. Class A circuit is classified under CO4- R
 (a) Mealy model (b) Moore model (c) Both a & b (d) None of the above
9. A register is able to hold _____ CO5-R
 (a) Data (b) Word (c) Nibble (d) Both data and word
10. The evolution of PLD began with _____ CO5-R
 (a) Diode (b) Resistor (c) Capacitor (d) Flip Flop

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Prove the following Boolean expression CO1- App (8)

$$(A + B)(\bar{A} \bar{C} + C)(\bar{B} + AC) = \bar{A}B$$
12. Design a 4-bit parallel adder/subtractor and explain the operation with logic diagram. CO2- App (8)
13. Design S-R flip flop using T flip flop. CO3- App (8)
14. Design a sequential circuit that will add two binary numbers in bit by bit manner for any change in X. CO4- Ana (8)
15. Design a Binary-to-Gray converter similar to basic ROM Structure CO5- App (8)