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Question Paper Code: 93804

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

Third Semester

Information Technology

19UIT304 - DIGITAL PRINCIPLES AND SYSTEM DESIGN

(Regulation 2019)

Duration: One hour

Maximum: 30 Marks

Answer ALL Questions

PART A - (5 x 6 = 30 Marks)

1. (a) Convert the decimal number 431 in to binary in two ways. App (6)
- (i) Convert directly to binary.
- (ii) Convert first to hexadecimal and then from hexadecimal to binary.
- Or
- (b) Convert the following binary numbers to hexadecimal and to decimal App (6)
- (i) 1.10010
- (ii) 110.010
2. (a) Show that the dual of the exclusive-OR is equal to its complement. App (6)
- Or
- (b) The logical sum of all min terms of a Boolean function of n variables is 1, Prove the previous statement for n=3. App (6)
13. (a) Construct a 4-to-16 line decoder with five 2-to-4 line decoders with enable. App (6)
- Or
- (b) Construct a 5-to-32 line decoder with four 3-to-8 line decoders with enable and a 2-to-4 line decoder. Use block diagrams for the components. App (6)

14. (a) Design a code converter that converts a decimal digit from the 8,4,-2,-1 code to BCD. App (6)

Or

- (b) Design an Excess-3 to BCD decoder using the unused combinations of the code as don't care conditions. App (6)

15. (a) Find a circuit that has no static hazards and implements the Boolean function. $F(A,B,C,D) = \sum (0,2,6,7,8,10,12)$ App (6)

Or

- (b) Draw the logic diagram of Product-of-sum expression $Y=(X1+X2')(X2+X3)$ Show that there is a static-0 hazard when $x1$ and $x3$ are equal to zero and $x2$ goes from zero to one. Find a way to remove hazard by adding one more gate. App (6)