Roll No. Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (CSE/IT) (2018 Batch) (Sem.–3)

DIGITAL ELECTRONICS

Subject Code : BTES-301-18

M.Code : 76435

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Write briefly :

1. Perform the subtraction 1001_2-1110_2 using 1's complement method of subtraction.
2. Convert 38_{16} hexadecimal number to binary.
3. Convert the BCD number 00011000 to decimal number.
4. Write the truth table of 3-input OR gate.
5. Give the functional difference between a NAND gate and a negative OR gate.
6. Construct a truth table for the given Boolean expression AB+BC.
7. Give the comparison between synchronous & Asynchronous sequential circuits.
8. Determine the resolution of the output from a DAC that has a 12-bit input.
9. What is the difference between static RAM and dynamic RAM?
10. Draw the logic diagram for SR latch using two NOR gates.

SECTION-B

11. Using the Boolean Algebra, simplify the expression:

$$\left(A+\overline{A}\right)\left(AB+AB\overline{C}\right)$$

12. Use a Karnaugh map to simplify the function to its minimum sum of product form:

$$X=\overline{A}\overline{B}\overline{C}\overline{D}+\overline{A}\overline{B}C\overline{D}+A\overline{B}\overline{C}\overline{D}+\overline{A}CD+A\overline{B}C\overline{D}$$

13. Design a Excess-3 to BCD code converter using minimum number of NAND gates.

14. Explain the operation of master-slave J-K flip flop. Give its advantages.

15. Design a 4-bit asynchronous up/down counter and explain its working with the help of timing diagram.

SECTION-C

16. Simplify using K-map

    f(ABCD) = ΠM(l,3,5,7,8,9,l0,13,15) and implement using NAND/NOR logic.

17. a) Explain how a 4-bit R/2R register DAC works?

    b) Design and working of a synchronous MOD- 6 counter using JK FF.

18. Write short notes on **any two** :

    a) PLA

    b) Ring Counter

    c) BCD to 7 segment decoder

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SECTION-A

Write briefly :

1) What are the universal gates? Justify.

2) State De-Morgan's Theorem.

3) Write the characteristic equation of 4×1 multiplexer.

4) State the differences between combinational and sequential circuits.

5) Draw the excitation table of D flip flop.

6) Convert 101011 into Decimal system & Octal system.

7) Draw the state diagram of 3 bit up counter.

8) State the functions of flip flops.

9) Define Melay machine with state diagram.

10) Compare PLA, PAE and PROM.

SECTION-B

11) Design a 5×32 decoder using 3×8 decoder and summarize that how many decoders are required for designing?

12) Design a two bit magnitude comparator and draw its logic circuit.

13) Elucidate the design procedure of synchronous sequential circuits.

14) Perform the following addition by 2's complement :

a) 20 to –26

b) 25 to –15.

15) What are various law s for Boolean logic simplification?

SECTION-C

16) Design and implement BCD to gray code converter using PAL.

17) a) What are the different logic gates? Give their truth tables.

b) Write a short note on static, bipolar and MOSFET RAM cell.

18) Draw the logic circuit, excitation table & truth table of RS Flip-Flop.

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