17U325 (Pages: 2) Name: ……..……

Reg. No…….……

THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

(Supplementary/Improvement)

(CUCBCSS - UG)

CC15U BCS3 B04 - FUNDAMENTALS OF DIGITAL ELECTRONICS

(Computer Science – Core Course)

(2015 & 2016 Admissions)

Time: Three Hours Maximum: 80 Marks

PART A

Answer ***all*** questions. Each question carries 1 mark.

1. What is the importance of binary number system in digital computers?
2. Find the 2's complement of $(1000)_2$.
3. Give the truth table of XOR gate.
4. Define maxterm.
5. The simplified form of a Boolean equation $(AB + A\bar{B})$ is ----------.
6. What is a combinational circuit?
7. What is the bit storage capacity of any flip flop?
8. The maximum possible range of bit-count specifically in n-bit binary counter consisting of 'n' number of flip-flops is
9. Give the characteristic equation of S-R flip flop.
10. The number of binary bits at the input of a digital-to-analog converter (DAC) is known as ----------.

(10 x 1 = 10 Marks)

PART B

Answer ***all*** questions. Each question carries 2 marks.

11. Find the binary equivalent of $(FACE)_{16}$
12. What do you mean by Excess – 3 code?
13. Explain hamming code.
14. Draw the logic diagram of half adders.
15. What are the applications of A/D convertors?

(5 x 2 = 10 Marks)

PART C

Answer any ***five*** questions. Each question carries 4 marks.

16. Perform binary addition on $(1101011)_2$ and $(11011)_2$

17. State and prove DeMorgan's law.
18. Write short note on error detection and correction codes.
19. Find the minimum sum of products expression for $F(A,B,C,D) = \sum m(0,2,3,4,7,8,14)$
20. Explain 4 x 1 multiplexers in detail.
21. Differentiate between combinational circuit and sequential circuit.
22. Explain JK and T flipflops.
23. Explain BCD to 7 – segment decoder.

(5 x 4 = 20 Marks)

PART D

Answer any ***five*** questions. Each question carries 8 marks.

24. Explain the postulates and identities of Boolean algebra in detail.
25. Perform the following operations.
    a) Convert $(1101011)_2$ to hexadecimal
    b) Convert $(121)_3$ to decimal.
    c) Find the 9's complement of $(1270)_2$
    d) Convert $(100111)_2$ to corresponding gray code.
26. What do you mean by K-map? Discuss with suitable examples for 3 variables and 4 variables.
27. What do you mean by universal gates? Draw the NOR gate implementation and find the minimum number of NOR gates required for F= PQ+ QR+ RS+ST
28. What are shift registers? Explain different types of shift registers in detail.
29. Explain Ring and Johnson counters in detail.
30. What is ADC? Why it is needed? Explain Dual Slope and Successive Approximation A/D Converters.
31. Explain different types of Analog to Digital converters.

(5 x 8 = 40 Marks)

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