

15U318

(Pages:2)

Name: .....

Reg. No.....

**THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2016**

(CUCBCSS - UG)

**CC15U BCS3 B04- FUNDAMENTALS OF DIGITAL ELECTRONICS**

Computer Science – Core Course

(2015 Admission)

Time: Three Hours

Maximum: 80 Marks

**PART A**

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

1. Find the 3's complement of  $(1121)_3$
2. Give the truth table for NAND gate.
3. ASCII stands for.
4. What do you mean by gray code?
5. State involution law.
6. Write the Boolean function for sum and carry of a full adder.
7. How many possible outputs would a decoder have with a 6-bit binary input?
8. The characteristic equation of JK flip-flop is
9. How many flip-flops are required to produce a divide-by-128 device?
10. The terminal count of a 3-bit binary counter in the DOWN mode is?

(10 x 1 = 10 Marks)

**PART B**

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

11. Explain binary subtraction in two's complement method with an example.
12. What do you mean by error correction? Give an example of error correcting codes.
13. Simplify  $F(A, B, C) = \bar{A}B + B\bar{C} + BC + A\bar{B}\bar{C}$
14. Explain Half adder.
15. What are the uses of shift registers?

(5 x 2 = 10 Marks)

**PART C**

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

16. Explain various logic gates in detail.
17. Write short note on any four digital codes.
18. Find the POS of the Boolean expression,  $\bar{A}B + A\bar{B} + \bar{A}\bar{C}$

19. Discuss multiplexers in detail.
20. Write short note on Johnson's counter.
21. What are flip flops? Explain SR, D, JK and T flipflops.
22. Explain Aynchronous counters in detail.
23. Explain the working of Digital to Analog convertors.

(5 x 4 = 20 Marks)

#### PART D

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

24. Perform the following operations.
  - a) Convert  $(1278.56)_{10}$  to hexadecimal
  - b) Convert  $(10001100.101001)_2$  to octal
  - c) Find the 2's complement of  $(1000)_2$
  - d) Subtract  $(100111)_2$  from  $(110000)_2$
25. What are the different methods available to simplify Boolean expressions? Discuss with suitable examples.
26. Explain the steps to construct AND, OR and NOT gates using universal gates. Draw a logic circuit using only NAND gates to implement the following Boolean expression:  
 $Y = AB + C$ .
27. What is the function of a decoder? Explain BCD to 7-segment decoder.
28. Explain various shift registers in detail.
29. Write notes on Synchronous and Asynchronous up down counters.
30. Discuss in detail, the different types of Analog to Digital convertors.

(5 x 8 = 40 Marks)

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