Register Number:

Date: 15-01-2021

ST. JOSEPH'S COLLEGE (AUTONOMOUS), BANGALORE-27

BCA –I SEMESTER

SEMESTER EXAMINATION: JANUARY 2021

CA1418: DIGITAL FUNDAMENTALS AND LOGIC DESIGN

Time- 2 1/2 hrs **Max Marks-70**

PART A

Answer all the questions (10 * 2=20)

1. What are non-positional numbers? Give example.
2. What is a Logic gate? Mention any one application of logical gates.
3. Convert FACE $_{(16)}$ to its decimal equivalent.
4. Mention any two difference between sequential and Combinational circuits.
5. How is a RAM chip different from a ROM chip?
6. Design Logic circuit for X-NOR gate with truth table.
7. how JK flip flop is different from SR flip flops.
8. What is an encoder?
9. Mention the features of SRAM.
10. Simplify x+ x'y + y'+ (x + y') x' y

PART B

Answer any **Five** of the following questions (5 * 6=30)

11. Perform the **binary** operations on the following numbers

    a) 120+168

    b) 168-120

    c) 168* 120

12. Subtract 76 from 38 using two's complement method. Mention in detail the steps involved.

13.. Design a combination circuit for a full adder and explain it in detail.

14. With a neat block diagram explain the working of a Master Slave flip flop in detail with a mention of its truth table.

15. State and prove the two De-Morgan's theorems in detail with truth table.

16. Classify Read Only Memory and explain in detail.

17. Explain the working of four-bit synchronous counter.

SECTION C

Answer any **Two** questions. 10*2=20

18. Simplify the following Boolean function using K maps:

F (A, B, C, D) = $\sum$ (0, 1, 2, 4, 5, 9 ,12) don't care conditions = (7,11,15)

19. Design a 4:1 multiplexer and explain its functionality in detail with truth table.

20. Explain in detail the various modes of operations of registers.