M 054/060

Enrolment Number										

Total No. of printed pages = 03

Monsoon, 2023

B.C.A Semester Examinations

DIGITAL LOGIC

Course Code: BCA23102T

Full Marks – 60 **Time – 2 ½ hours**

The figure in the margin indicates full marks for the questions.

Part A

Answer ALL questions

Multiple Choice(10 x 1mark = 10marks)

1. a) Largest Unsigned Binary number can be stored in a 8 bit register is
   (i) 127
   (ii) 128
   (iii) 255
   (iv) 256

   b) In Boolean algebra if A+1 =1 then the value of A is
   (i) 1
   (ii) 0
   (iii) 1 or 0
   (iv) None of the these

   c) The even parity bit for 1011 1011 is
   (i) 1
   (ii) 0
   (iii) 1 or 0
   (iv) None of the these

   d) The gray code for 1101
   (i) 1011
   (ii) 1010
   (iii) 0010
   (iv) None of these

   e) if F1(ABC)=∑ (0,1,2,3) and F2(ABC)=∑ (4,5,6,7) then
   (i) F1(ABC)=F2(ABC)
   (ii) F1(ABC)+F2(ABC)= 1
   (iii) {F1(ABC)}/={F2(ABC)}/
   (iv) None of the these

   f) Which is not an Universal gate
   (i) NOR gate
   (ii) NAND gate
   (iii) EXOR gate

(iv) All of these

g) Which is a register
(i) MAR
(ii) Program Counter
(iii) Accumulator
(iv) All of these

h) To address 1000 locations we need an address size of
(i) 8 bits
(ii) 9 bits
(iii) 10 bits
(iv) 11 bits

i) Random Access Memory is a
(i) Volatile memory
(ii) Semiconductor memory
(iii) Main memory
(iv) All of these

j) The number -7 in -8421 code is
(i) 1001
(ii) 1100
(iii) 1010
(iv) 1011

Part B

Answer ANY FOUR questions
(4x 5 mark = 20 marks)

2. Convert
(i) Decimal number -128.50 into binary
(ii) Hexadecimal number 1A1B in to Octal

3. Add
(i) Binary numbers 1011, 1001, 1111, 1100
(ii) BCD the numbers 0111 and 0101

4. Simplify using 2's complement
(i) -12 + 13
(ii) -12- 13

5. Draw the NOR-NOR Circuit for the following:
F(ABC) = AB+BC+CA

6. Represent the following functions using a Decoder and OR gates

$F1(xyz) = xyz'$
$F2(xyz) = \sum(5,6,7)$

7. What is the problem of SR flip – flop ? How it is solved using D Flip flop? Explain with diagrams.

Part C

Answer ANY TWO questions
(2 x10 mark = 20 marks)

8. a) Reduce the Given Boolean function using k-map
   F(WXYZ) = F(0,1, 2,4,6,8,9,10,12,14)
   b) Design a counter for the following outputs using T flip flop
   1,3,4,5,7 and repeat

9. a) Draw a 8X1 multiplexer and explain its working principle.
   b) Draw the excitation table for SR flip flop and explain.

10 a) What is Master Slave flip flop. Draw the diagram for JK master slave flip flip and explain it.
   b) Represent -135 in IEEE 32 bit floating point representation.

Part D

Short Notes
(2 x5 mark = 10marks)

11. Write any two :
   a) Full Adder and its working principle
   b) Binary Cell and its working principle
   c) Postulates of Boolean algebra
   d) Designing a 4X4 ROM

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