ISLAMIAH COLLEGE [AUTONOMOUS], VANIYAMBADI
END SEMESTER EXAMINATIONS, NOVEMBER-2016

Time : 3 Hrs. Max.Marks:75

Subject: **Digital Logic Fundamentals** Sub.Code: **U5CC1001**

PART-A (10 X 2 = 20)
Answer ALL the Questions

1. Given two binary numbers X=1010100 and Y=1000011.Perform X-Y using 1's Complement .
2. State the steps involved in Gray to Binary conversion.
3. Express the function f(x, y, z)=1 in the sum of minterms and a product of maxterms.
4. Find the Complement of the functions
   (i)F1=x'yz'+x'y'z and
   (ii)F2=x(y'z'+yz)
5. What is Overflow?
6. What do you mean by Comparator?
7. Define Flip-Flop.
8. What is the difference between Synchronous and Asynchronous sequential circuits?
9. Define DMA.
10. What is Cache memory?

PART-B (5 X 5 = 25)
Answer ALL the Questions

11 a. Convert the following:
   (i)$(253.23)_{10} = (?)_2$
   (ii)$(1001.10001)_2 = (?)_{16}$

Or

b. Write a note on BCD Code.

12 a. Discuss the Sum of products and Product of sums with examples.

Or

b. Explain the implementation of Basic logic gates using NAND gates only.

13 a. Explain the Full Subtractor with a suitable logic diagram and a truth table.

Or

b. Explain: Multiplexers and Demultiplexer.

14 a. Discuss the principle of JK Master slave Flip Flop using logic circuits.

Or

b. Briefly explain the 3-bit binary Ripple counter with truth table.

15 a. Explain any three peripheral devices.

Or

b. Write a note on Random Access Memories.

PART-C (3X 10 = 30)
Answer any THREE Questions

16. Convert the following:
   (a)$(873.124)_8=(?)_2$
   (b)$(153.513)_{10} = (?)_8$
   (c)$(001100000110.1101)_2 = (?)_{16}$
17. Simplify using K-map and draw the circuit
   $F(A,B,C,D)=\sum(0,1,2,4,5,10,11,14,15)$
18. Explain
   (i)Full Adder and
   (ii)BCD Adder
19. Explain Shift registers with a neat diagram
20. Explain
   (i)I/O mapped I/O and
   (ii) Memory Mapped I/O

ISLAMIAH COLLEGE [AUTONOMOUS], VANIYAMBADI
END SEMESTER EXAMIANTIONS - NOVEMBER - 2016

Time : 3 Hrs Max. Marks: 75

Subject: **Digital Logic Fundamentals**

Sub. Code: **U3CS1001/U3SW1001/U3BC1001**

PART - A (10 X 2 = 20)

Answer ALL the Questions

1. Define Excess-3 code.
2. Define radix.
3. Define boolean function.
4. What is POS?
5. Define Decoder.
6. What is Multiplexer?
7. What is a Shift Register?
8. Draw the circuit of JK flip flop.
9. Define the term- assembler.
10. What are secondary memories?

PART - B (5 X 5 = 25)

Answer ALL the Questions

11. (a) Convert the following hexadecimal number to decimal equivalents:
    (i) AB6 (ii) 3A6

    (Or)

    (b) Explain alphanumeric codes in detail.

12. (a) Explain two variable k-map with an example.

    (Or)

    (b) Explain sum of products (SOP) with an example.

13. (a) Write a note on encoder.

    (Or)

    (b) Explain full adder with necessary logic circuit.

14. (a) Differentiate between synchronous and asynchronous counter.

    (Or)

    (b) Explain D flip flop with neat circuit and truth table.

15. (a) Explain assembly language and high level language.

    (Or)

    (b) Write short note on Cache memory.

PART - C (3 X 10 = 30)

Answer any THREE Questions

16. Explain error detecting and error correcting code.
17. Explain the various logic gates with truth table.
18. Explain the following: (i) Half subtractor (ii) Binary Adder.
19. Explain the working of shift register with a neat circuit and table.
20. Explain the different types of primary memory.

ISLAMIAH COLLEGE [AUTONOMOUS], VANIYAMBADI

END SEMESTER EXAMINATIONS, NOVEMBER-2016

Time : 3 Hrs. Max.Marks:75

Subject: **Digital Logic Fundamentals** Sub.Code: **U5CC1001**

PART-A (10 X 2 = 20)

Answer ALL the Questions

1. Given two binary numbers X=1010100 and Y=1000011.Perform X-Y using 1's Complement .
2. State the steps involved in Gray to Binary conversion.
3. Express the function f(x, y, z)=1 in the sum of minterms and a product of maxterms.
4. Find the Complement of the functions
   (i)F1=x'yz'+x'y'z and
   (ii)F2=x(y'z'+yz)
5. What is Overflow?
6. What do you mean by Comparator?
7. Define Flip-Flop.
8. What is the difference between Synchronous and Asynchronous sequential circuits?
9. Define DMA.
10. What is Cache memory?

PART-B (5 X 5 = 25)

Answer ALL the Questions

11 a. Convert the following:
   (i)$(253.23)_{10} = (?)_2$
   (ii)$(1001.10001)_2 = (?)_{16}$

Or

b. Write a note on BCD Code.

12 a. Discuss the Sum of products and Product of sums with examples.

Or

b. Explain the implementation of Basic logic gates using NAND gates only.

13 a. Explain the Full Subtractor with a suitable logic diagram and a truth table.

Or

b. Explain: Multiplexers and Demultiplexer.

14 a. Discuss the principle of JK Master slave Flip Flop using logic circuits.

Or

b. Briefly explain the 3-bit binary Ripple counter with truth table.

15 a. Explain any three peripheral devices.

Or

b. Write a note on Random Access Memories.

PART-C (3X 10 = 30)

Answer any THREE Questions

16. Convert the following:
   (a)$(873.124)_8=(?)_2$
   (b)$(153.513)_{10} = (?)_8$
   (c)$(001100000110.1101)_2 = (?)_{16}$
17. Simplify using K-map and draw the circuit
   $F(A,B,C,D)=\sum(0,1,2,4,5,10,11,14,15)$
18. Explain
   (i)Full Adder and
   (ii)BCD Adder
19. Explain Shift registers with a neat diagram
20. Explain
   (i)I/O mapped I/O and
   (ii) Memory Mapped I/O

ISLAMIAH COLLEGE [AUTONOMOUS], VANIYAMBADI
END SEMESTER EXAMIANTIONS - NOVEMBER - 2016

Time : 3 Hrs Max. Marks: 75

Subject: **Digital Logic Fundamentals**

Sub. Code: **U3CS1001/U3SW1001/U3BC1001**

PART - A (10 X 2 = 20)

Answer ALL the Questions

1. Define Excess-3 code.
2. Define radix.
3. Define boolean function.
4. What is POS?
5. Define Decoder.
6. What is Multiplexer?
7. What is a Shift Register?
8. Draw the circuit of JK flip flop.
9. Define the term- assembler.
10. What are secondary memories?

PART - B (5 X 5 = 25)

Answer ALL the Questions

11. (a) Convert the following hexadecimal number to decimal equivalents:

(i) AB6 (ii) 3A6

(Or)

(b) Explain alphanumeric codes in detail.

12. (a) Explain two variable k-map with an example.

(Or)

(b) Explain sum of products (SOP) with an example.

13. (a) Write a note on encoder.

(Or)

(b) Explain full adder with necessary logic circuit.

14. (a) Differentiate between synchronous and asynchronous counter.

(Or)

(b) Explain D flip flop with neat circuit and truth table.

15. (a) Explain assembly language and high level language.

(Or)

(b) Write short note on Cache memory.

PART - C (3 X 10 = 30)

Answer any THREE Questions

16. Explain error detecting and error correcting code.
17. Explain the various logic gates with truth table.
18. Explain the following: (i) Half subtractor (ii) Binary Adder.
19. Explain the working of shift register with a neat circuit and table.
20. Explain the different types of primary memory.

ISLAMIAH COLLEGE (AUTONOMOUS), VANIYAMBADI END SEMESTER EXAMINATIONS		
U3BC1001/U3CS1001/U3SW1001		APRIL/MAY-2017
DIGITAL LOGIC FUNDAMENTALS		
Time: 3 Hrs		Max.Marks:75

PART - A (10 X 2 = 20)
Answer ALL the Questions

1. Convert the decimal 153.513 to octal?
2. What is an alphanumeric code?
3. Simplify: $x^1y^1z + x^1yz + xy^1$
4. Define : Quad in K-map.
5. What is multiplexer?
6. What is decoder?
7. What is shift register?
8. What is flip flop?
9. List out hierarchy of memory.
10. Justify the need for DMA.

PART – B (5 X 5 = 25)
Answer ALL the Questions

11. (a) Explain the error detecting and correcting codes with examples.

    (OR)

    (b) (i) Convert $(9746)_{16}$ into Binary
    (ii) Convert $(A85)_{16}$ into Decimal

12. (a) Explain the truth table of Universal Gates.

    (OR)

    (b) Implement the following function with NAND gates: $F(x, y, z) = \Sigma (0,6)$

13. (a) Explain in detail about decoder and draw the sketch.

    (OR)

    (b) Explain in detail about Full Subtractor.

14. (a) Construct synchronous counter and explain.

    (OR)

    (b) Explain the R-S flip-flop with neat diagram.

15. (a) State the advantages and disadvantages of cache memory.

    (OR)

    (b) Explain Primary Memory.

PART - C (3 X 10 = 30)
Answer any THREE Questions

16. Explain the subtraction with r's complements and (r-1)'s complements with example.

17. 16. Simplify the Boolean function:
    $f(w,x,y,z) = \sum(1,3,7,11,15)$ and the don't care conditions $d(w,x,y,z) = \sum(0,2,5)$

18. Explain the de multiplexers with the logic diagram and function table.

19. Explain the working of Master Slave flip flop with a neat circuit and table.

20. Explain in detail with a block diagram Direct Memory Access.

ISLAMIAH COLLEGE [AUTONOMOUS], VANIYAMBADI
END SEMESTER EXAMIANTIONS – APRIL / MAY - 2017

Time : 3 Hrs **Max. Marks: 75**

Subject: Digital Logic Fundamentals **Sub. Code: U5CC1001**

PART - A (10 X 2 = 20)

Answer ALL the Questions

1. Convert $(9A.A)_{16} = (x)_{10}$
2. What is binary number system?
3. Define boolean algebra.
4. What is SOP?
5. What is demultiplexer?
6. Define encoder.
7. What is a flip flop?
8. Write the truth table of D flip flop.
9. Define cache memory.
10. Define the term – operating system.

PART - B (5 X 5 = 25)

Answer ALL the Questions

11. (a) Explain the following: (i) ASCII (ii) EBCDIC

(OR)

(b) Write short notes on binary codes.

12. (a) Explain Don't care condition with an example.

(OR)

(b) Explain the product of sum (POS) method with an example.

13. (a) Explain half adder with its circuit and truth table.

(OR)

(b) What is demultiplexer? Explain.

14. (a) Explain RS flip flop with a neat diagram and a truth table.

(OR)

(b) Discuss in detail the working of synchronous counter.

15. (a) Explain merits and demerits of assembly language

(OR)

(b) Explain the following: (i) Assembler (ii) Compiler (iii) Interpreter.

PART - C (3 X 10 = 30 MARKS)

Answer any THREE Questions

16. Convert the following octal number to decimal:

(i) 46 (ii) 125 (iii) 765 (iv) 12.6

17. Simplify using K-map method $F=(A,B,C,D)=\sum(0,1,2,4,5,8,9)$
18. Explain the following: (i) Full Subtractor (ii) Binary Adder.
19. Explain the working of shift register with a neat circuit and an example.
20. Explain primary memory and its types.

ISLAMIAH COLLEGE [AUTONOMOUS] - VANIYAMBADI

ARREAR EXAMINATIONS – AUGUST – 2018

TIME: 3 Hrs MAX. 75 Marks

Subject: Digital Logic Fundamentals

Sub. Code: U5CC001 / U3CS1001 / U3BC1001

PART-A (10 X 2 = 20)
Answer ALL Questions

1. Convert $(59.23)_{10}$ into binary.
2. Find the 9's and 10's complement of decimal 00000000.
3. What are *minterms* and *maxterms*?
4. Define Principle of Duality.
5. Choose most suitable answer. Multiplexer can be expressed as
   (a) one-to-many. (b) many-to-one. (c) many-to-many. (d) one-to-one.
6. Fill in the blanks. To add 16 bit numbers, ____ half adders and ____full adders are required, respectively. (a) 8, 8 (b) 1, 15 (c) 16, 0 (d) 15, 1
7. Write down the truth table of D flip-flop.
8. Name the four basic types of shift register.
9. What is a cache memory?
10. What is DMA?

PART-B (5 X 5 = 25)
Answer ALL Questions

11. a. Evaluate in hexadecimal the following expression: $(3569)_{10} + (12956)_8$

OR

b. Add and multiply $(110110)_2$ and $(110101)_2$ without converting to decimal.

12. a. Reduce the following function using Karnaugh map and implement with NAND gates only: $f = \sum m\,(1, 2, 4, 5, 7, 9, 10, 11, 13, 14)$.

OR

b. Implement the following Boolean expression with exclusive-OR and AND gates: $F = AB'CD' + A'BCD' + AB'C'D + A'BC'D$

13. a. Design a 4 to 1 multiplexer using 2 x 1 multiplexers and explain its functions.

OR

b. Implement the Boolean function F (A, B, C, D) = $\sum$ (1, 3, 4, 11, 12, 13, 14, 15) using Multiplexer.

14. a. Design a four-bit synchronous binary counter and explain.

OR

b. Design a four-bit shift register with parallel load.

15. a. Write a note on read only memories.

OR

b. Discuss Input Output Processor briefly.

PART-C (3 X 10 = 30)
Answer any THREE Questions

16. What are Weighted, Un-weighted, Self-complementing and Alphanumeric Codes? Give examples for each.
17. Simplify the following using K -map:
    $F\,(A,B,C,D) = \sum m\,(7, 8, 9) + \sum d\,(10, 11, 12, 13, 14, 15)$.
18. With neat diagram and truth table explain encoder and decoder.

ISLAMIAH COLLEGE [AUTONOMOUS] -VANIYAMBADI
END SEMESTER EXAMINATIONS, JANUARY – 2021

TIME: 3 Hrs **MAX. 75 MARKS**

Class: I B.Sc (CS/SW)/ I B.C.A **Semester I**

U5CC1001: Digital Logic Fundamentals
PART-A (10 X 2 = 20 MARKS)
Answer ALL Questions

1. Convert hexadecimal 2AC5 into decimal and octal.
2. Find the 2's complement and 16's complement of C3DF.
3. Simplify the Boolean function (i) F (x, y, z) = ∑ (3, 4, 6,7)
4. Define Karnaugh Map.
5. What is full subtractor?
6. What is an encoder?
7. List two types of edge triggered flip-flops.
8. What is a sequential circuit?
9. How many bits are present there in a data and address inputs of the memory?
10. What is BCD ripple counter?

PART-B (5 X 5 = 25 MARKS)
Answer ALL Questions

11. (a). What is the largest binary number that can be obtained with 8-bits? What is its decimal equivalent?

(Or)

(b). Reduce (i) $A'A' + ABC + AB'$ (ii) $A'(A' + A'A) + A(A + A'BC)$ (iii) $ABC'A + A'BC + ABCD$

12. (a) Simplify the Boolean function into (a) sum-of-products form and (b) product-of-sums form

(i) F (A, B, C, D) = ∑ (0, 1, 2, 5, 8, 9, 10)

(ii) $ABC' + A'B + BB' + ABCD$

(Or)

(b) Simplify the expression by K-map $BC + A'B + A'BC + ABCD$

13. (a) Design a code converter that converts a decimal digit from (i) The 8, 4, –2, –1 code to BCD (ii) The 8, 4, –2, –1 code to Gray code.

(Or)

(b) Design a 4-bit magnitude comparator and explain its working with example.

14. (a) Differentiate between combinational and sequential circuits.

(Or)

(b). Draw the logic diagram and truth table of (i) D flip flop (ii) J-K flip flop (iii) T flip-flop.

15. (a) Design a four-bit universal shift register and explain its working.

(Or)

(b) Differentiate between asynchronous and synchronous counter.

PART-C (3 X 10 = 30 MARKS)
Answer any THREE Questions

16. (a). What bit must be complemented to change an ASCII letter from capital to lowercase and vice versa?

(b) What are the canonical forms? Give example of its two types.

17. The truth table of Y in terms of three inputs A,B and C are given. Draw the logic realization of Y using only (i) NAND gates only (ii) NOR gates.

A	0	1	0	1	0	1	0	1
B	0	0	1	1	0	0	1	1
C	0	0	0	0	1	1	1	1
Y	1	1	1	0	1	0	0	0

18. Design a combinational circuit with three inputs, x ,y and z, and three outputs, A, B and C. When the binary input is 0, 1, 2, or 3, the binary output is one greater than the input. When the binary input is 4, 5, 6, or 7, the binary output is two less than the input.

19. A sequential circuit has two JK flip-flops A and B, two inputs *x* and y, and one output *z*.
The flip-flop input equations and circuit output equation are
$J_A = BC + B'A'$ $K_A = B'AB'$
$J_B = B'A$ $K_A = C + CB'$
$z = BCA'A + BCA'B'$

20. What is the difference between serial and parallel transfer? Explain how to convert serial data to parallel and parallel data to serial. What type of register is needed?

ISLAMIAH COLLEGE [AUTONOMOUS] -VANIYAMBADI
END SEMESTER EXAMINATIONS, JANUARY – 2021

TIME: 3 Hrs **MAX. 75 MARKS**

Class: I B.Sc (CS)/ I B.C.A **Semester I**

U8CC1001: Digital Logic Fundamentals
PART-A (10 X 2 = 20 MARKS)
Answer ALL Questions

1. Define Boolean algebra with its postulates.
2. Express the following numbers in decimal:
   (a) $(10110.0101)_2$ (b) $(16.5)_{16}$
3. Simplify the Boolean function
   (i) $\square = \square\square\square' + \square\square\square' + \square\square\square\square' + \square\square'\square'$
4. Minimize (i) F(A,B,C)= π (0,3,6,7)
5. What is a decoder?
6. What is a full adder?
7. What is a race condition in S-R flip flop?
8. What are asynchronous circuits?
9. Define Ring Counter.
10. Name the four basic types of shift register.

PART-B (5 X 5 = 25 MARKS)
Answer ALL Questions

11. (a). Find the 9's and the 10's complement of the following decimal numbers:
    (i) 25 (ii) 600 (iii) 000 (iv) 9999

    (Or)

    (b). What is Gray Code? Give its two applications. Write Gray code for decimal 0 to 15.

12. (a) Derive the circuits for a three-bit parity generator and four-bit parity checker using an odd parity bit.

    (Or)

    (b) Implement the Boolean function with NAND gates:
    $F(x, y, z) = \sum(1, 2, 3, 4, 5, 7)$

13. (a) Design a combinational circuit that converts a four-bit Gray code to a bit four binary number.

    (Or)

    (b) Give the difference between a carry and an overflow.

14. (a) Explain S-R latch with logic diagram and truth table.

    (Or)

    (b). Discuss Mealy and Moore state machines.

15. (a) Differentiate between asynchronous and synchronous counter.

    (Or)

    (b) Design a four- bit binary synchronous counter with D flip- flops.

PART-C (3 X 10 = 30 MARKS)
Answer any THREE Questions

16. For the function $\square = \square\square\square' + \square\square'\square' + \square'\square\square + \square\square\square' + \square\square\square$
    (i) Obtain truth table and logic diagram of F
    (ii) Obtain truth table and logic diagram of simplified expression of F.

17. (a). Simplify (i) F(A,B,C,D)=∑(0,2,5,7,8,10,13,15)
    (ii) $F(w, x, y, z) = \sum(0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)$
    (b). Express $(\square, \square, \square) = (\square\square + \square)(\square\square + \square)$ into sum of minterms and product of maxterms.

18. The adder/subtractor circuit has the following values for mode input M and data inputs A and B.

	M	A	B
(a)	0	0111	0110
(b)	0	1000	1001
(c)	1	1100	1000
(d)	1	0101	1010
(e)	1	0000	0001

    In each case, determine the values of the four SUM outputs, the carry C and overflow V.

19. Explain Master-Slave J-K flip flop. What are the advantages of using this over normal flip-flop?

20. The 4-bit serial adder uses two four- bit registers. Register A holds the binary number 0101 and register B holds 0111. The carry flip-flop is initially reset to 0. List the binary values in register A and the carry flip-flop after each shift.

ISLAMIAH COLLEGE [AUTONOMOUS] - VANIYAMBADI
END SEMESTER EXAMINATIONS, JUNE - 2022

Time: 3 Hrs Max. 75 Marks

Subject: Digital Logic Fundamentals **Sub. Code: U8CC1001**

PART-A(10 X 2 = 20)
Answer ALL Questions

1. Convert $(0.513)_{10}$ to octal.
2. What are Weighted and Un-weighted Codes?
3. Draw XOR gate using NOR gates only.
4. Find the complement of
5. What is a priority encoder?
6. Define combinational circuit.
7. Draw an S-R Latch and its truth table.
8. Define Moore Machine.
9. What is the difference between serial and parallel transfer?
10. What is a Ring Counter?

PART-B(5 X 5 = 25)
Answer ALL Questions

11. a. Express the following numbers in decimal:

    (i) $(10110.0101)_2$ (ii) $(16.5)_{16}$ (iii) $(26.24)_8$

    (iv) $(DAD.B)_{16}$ (v) $(1010.1101)_2$

    (Or)

    b. Given the two binary numbers X = 1010100 and Y = 1000011, perform (i) X - Y and (ii) Y - X by using 2's complements, and 1's complement.

12. a. Simplify the function $F(w, x, y, z) = \sum (1, 3, 7, 11, 15) + \sum d(0, 2, 5)$

    (Or)

    b. Simplify the expression by K-map

13. a. Design an Octal to Binary encoder with truth table.

    (Or)

    b. Design a 4-bit parallel binary adder.

14. a. Write the characteristic tables and characteristic equations of J-K, D and T-flip flops.

    (Or)

    b. Explain Master-Slave J-K flip flop. What are the advantages of using this over normal flip-flop?

15. a. Design a four-bit binary synchronous counter with D flip-flops.

    (Or)

    b. Design a counter with T flip-flops that goes through the binary repeated sequence:0, 1, 3, 7, 6, 4.

PART-C(3 X 10 = 30)
Answer any THREE Questions

16. (i) Simplify
    (ii) Express the Boolean function as a sum of minterms
    (iii) The state of a 12-bit register is 100010010111. What is its content if it represents(a) BCD(b) excess-3 (c) 8-4-2-1(d) binary number?

17. Derive the circuits for a three-bit parity generator and four-bit parity checker using an odd parity bit.

18. Design and explain a full Adder and a full subtractor with truth table, block diagram and circuit diagram.

19. (i) What are synchronous and asynchronous sequential circuits?
    (ii) Differentiate level-triggered and edge-triggered flip-flops.

20. Design a four-bit universal shift register and explain its working.

ISLAMIAH COLLEGE [AUTONOMOUS]-VANIYAMBADI-2
END SEMESTER EXAMINATIONS – APRIL 2019

Time: 3 Hrs Max. 75 Marks

Subject: Digital Logic Fundamentals

Sub. Code: U8CC1001 / U5CC1001

PART-A (10 X 2 = 20 MARKS)
Answer ALL Questions

1. Convert $(127.4)_8$, $(B65F)_{16}$, $(110101)_2$ to decimal.
2. Find the 9's and 10's complement of decimal 00000000.
3. Minimize F(A,B,C)= π (0,3,6,7)
4. Simplify F(A,B,C,D)=$\sum$(0,2,5,7,8,10,13,15)
5. What is a priority encoder?
6. Define Multiplexer.
7. List one type of asynchronous and three types of synchronous flip-flops.
8. Convert the following:(i) S-R to D flipflop
9. Name the four basic types of shift register
10. Mention a few applications of Counters.

PART-B (5 X 5 = 25 MARKS)
Answer ALL Questions

11. a. How many printing characters are there in ASCII? How many of them are special characters?

OR

b. Draw all logic gates with its symbol, algebraic function and truth table.

12. a. Derive the circuits for a three-bit parity generator and four-bit parity checker using an odd parity bit.

OR

b. Simplify F(w,x,y,z)= $\sum$ (0,1,2,3,7,8,10) + $\sum$d(5,6,11,15) and implement using NAND gates only.

13. a. Design a combinational circuit that converts a four-bit Gray code to a bit four binary number.

OR

b. Differentiate between decoder and demultiplexer.

14. a. Explain S-R latch with logic diagram and truth table.

OR

b. Discuss Mealy and Moore state machines.

15. a. Design a four-bit universal shift register and explain its working.

OR

b. Design and explain a BCD ripple counter.

PART-C (3 X 10 = 30 MARKS)
Answer any THREE Questions

16. Given two eight-bit strings A = 10110001 and B = 10101100, evaluate the eight-bit result after the following logical operations:(a) AND (b) OR (c) NOT (d) NAND (e) NOR (f) XOR (g) XNOR.
17. The truth table of Y in terms of three inputs A,B and C are given. Draw the logic realization of Y using only (i) NAND gates only (ii) NOR gates.

A	0	1	0	1	0	1	0	1
B	0	0	1	1	0	0	1	1
C	0	0	0	0	1	1	1	1
Y	1	1	1	0	1	0	0	0

18. The adder/subtractor circuit has the following values for mode input M and data inputs A and B.

	M	*A*	*B*
(a)	0	0111	0110
(b)	0	1000	1001
(c)	1	1100	1000
(d)	1	0101	1010
(e)	1	0000	0001

In each case, determine the values of the four SUM outputs, the carry C , and overflow V.

19. Explain Master-Slave J-K flip flop. What are the advantages of using this over normal flip-flop?
20. The 4-bit serial adder uses two four-bit registers. Register A holds the binary number 0101 and register B holds 0111. The carry flip-flop is initially reset to 0. List the binary values in register A and the carry flip-flop after each shift.

ISLAMIAH COLLEGE [AUTONOMOUS] VANIYAMBADI
END SEMESTER EXAMINATIONS, APRIL – 2019

Time : 3 Hrs Max. Marks: 75

Subject: Digital Logic Fundamentals **Sub. Code: U3CC1001**

PART – A (10 X 2 = 20)
Answer ALL Questions

1. Define radix.
2. Expand BCD.
3. What is priority Encoder?
4. What is POS?
5. Define Decoder.
6. Define Flip flop.
7. What is shift register?
8. What is counter?
9. Define the term- assembler.
10. What is Cache memory?

PART – B (5 X 5 = 25)
Answer ALL Questions

11. (a) Explain alphanumeric codes in detail.
(Or)
(b) Perform the following conversion.
(i) $(42.75)_8 = (\ )_2$ (ii) $(45.65)_{10} = (\ )_H$

12. (a) State and prove De Morgan's theorems.
(Or)
(b) Explain Basic Logic gates.

13. (a) Write a note on encoder.
(Or)
(b) Explain SOP and POS with example.

14. (a) Construct synchronous counter and explain.
(Or)
(b) Explain the functions of binary ripple counter.

15. (a) State the advantages and disadvantages of cache memory.
(Or)
(b) Write short notes on DMA.

PART – C (3 X 10 = 30)
Answer any THREE Questions

16. Explain the subtraction with r's complements and (r-1)'s complements with example.

17. Explain the various logic gates with truth table.

18. Explain the following: (i) Half subtractor (ii) Binary Adder.

19. Describe the operation of Master slave JK flip flop.

20. Explain in detail Direct Memory Access.

ISLAMIAH COLLEGE [AUTONOMOUS] - VANIYAMBADI
END SEMESTER EXAMINATIONS, JANUARY - 2021

Time: 3 Hrs Max. 75 Marks

Subject: Digital Logic Fundamentals **Sub. Code: U8CC1001**

PART-A (10 X 2 = 20)
Answer ALL Questions

1. Convert $(0.513)_{10}$ to octal.
2. What are Weighted and Un-weighted Codes?
3. Draw XOR gate using NOR gates only.
4. Find the complement of $x(y'z' + yz)$
5. What is a priority encoder?
6. Define combinational circuit.
7. Draw an S-R Latch and its truth table.
8. Define Moore Machine.
9. What is the difference between serial and parallel transfer?
10. What is a Ring Counter?

PART-B (5 X 5 = 25)
Answer ALL Questions

11. a. Express the following numbers in decimal:

(i) $(10110.0101)_2$ (ii) $(16.5)_{16}$ (iii) $(26.24)_8$

(iv) $(DAD.B)_{16}$ (v) $(1010.1101)_2$

(OR)

b. Given the two binary numbers X = 1010100 and Y = 1000011, perform (i) X - Y and (ii) Y - X by using 2's complements, and 1's complement.

12. a. Simplify the function $F(w, x, y, z) = \sum(1, 3, 7, 11, 15) + \sum d(0, 2, 5)$

(OR)

b. Simplify the expression by K-map $AC + B'D + A'CD + ABCD$

13. a. Design an Octal to Binary encoder with truth table.

(OR)

b. Design a 4-bit parallel binary adder.

14. a. Write the characteristic tables and characteristic equations of J-K, D and T-flip flops.

(OR)

b. Explain Master-Slave J-K flip flop. What are the advantages of using this over normal flip-flop?

15. a. Design a four-bit binary synchronous counter with D flip-flops.

(OR)

b. Design a counter with T flip-flops that goes through the binary repeated sequence:0, 1, 3, 7, 6, 4.

PART-C (3 X 10 = 30)
Answer any THREE Questions

16. (i) Simplify $xyz + x'y + xyz'$
(ii) Express the Boolean function $F = A + B'C$ as a sum of minterms
(iii) The state of a 12-bit register is 100010010111. What is its content if it represents(a) BCD(b) excess-3 (c) 8-4-2-1(d) binary number?

17. Derive the circuits for a three-bit parity generator and four-bit parity checker using an odd parity bit.

18. Design and explain a full Adder and a full subtractor with truth table, block diagram and circuit diagram.

19. (i) What are synchronous and asynchronous sequential circuits?
(ii) Differentiate level-triggered and edge-triggered flip-flops.

20. Design a four-bit universal shift register and explain its working.

ISLAMIAH COLLEGE [AUTONOMOUS], VANIYAMBADI
END SEMESTER EXAMINATIONS, FEBRUARY - 2022

Time: 3 Hrs Max. 75 Marks

Subject: Digital Logic Fundamentals

Sub. Code: U3BC1001

PART - A (10 X 2 = 20)
Answer ALL the Questions

1. Convert $(673.124)_8$ to binary.
2. Expand ASCII and EBCDIC.
3. What is Boolean function?
4. Show that $x'y + xy + y' = 1$
5. What is full-subtractor?
6. What is a BCD adder?
7. What is register?
8. How T-Flip Flop is working?
9. Compare high level language with low level language.
10. List any two types of primary memory.

PART – B (5 X 5 = 25)
Answer ALL the Questions

11. (a) Explain the conversion from binary to Gray and Gray to binary with an example.

    (OR)

    (b) Write a note on binary arithmetic with example.

12. (a) Reduce the following Boolean expression into its minimal form: $F(w,x,y,z) = \sum (0,1,2,4,5,6,8,9,12,13,14)$

    (OR)

    (b) Depict on universal gates.

13. (a) Explain about the Full-Adder with truth table.

    (OR)

    (b) Illustrate about magnitude comparator.

14. (a) Explain the JK flip-flop with neat diagram.

    (OR)

    (b) Explain: i) Latches ii) R-S Flip Flop.

15. (a) Explain Secondary Memory.

    (OR)

    (b) Briefly explain about I/O devices.

PART - C (3 X 10 = 30)
Answer any THREE Questions

16. Perform the following:
    (a) Convert Binary to Octal : 110101_2
    (b) Convert Hexadecimal to Decimal : $B2F8_{16}$
    (c) Convert Decimal to BCD : 1472
    (d) Convert Binary to Hexadecimal : 0011111100010110100b
    Convert Decimal to Excess-3 code : 159

17. Simplify using Quine Mc-Clusky method $F(A, B, C, D, E) = \sum (3,9,10,11,12,24,25,26,27)$

18. Explain the multiplexers with the logic diagram and function table.

19. With the help of sketch delineate about synchronous and asynchronous counters.

20. Explain in detail about the system software.

ISLAMIAH COLLEGE [AUTONOMOUS], VANIYAMBADI
END SEMESTER EXAMINATIONS, FEBRUARY - 2022

Time: 3 Hrs Max. Marks: 75

Subject: Digital Logic fundamentals and Microprocessors
Subject Code: UACC1001

PART - A (10 X 2 = 20)
Answer ALL the Questions

1. What is the purpose of complements in digital computers?
2. What is mean by Parity bit
3. Define Decoder.
4. What is mean by Positive and Negative logic system?
5. Define Latch.
6. What is mean by flip flop?
7. Mention any two sequential circuits
8. What is mean by Ripple counter?
9. Define Micro controller.
10. Mention any four flag registers in 8085 microprocessor

PART - B (5 X 5 = 25)
Answer ALL the Questions

11. (a) Convert the decimal number 795_{10}
    i) Binary(2marks) ii) Octal(2 marks) iii) hexa decimal (1 mark).

    (Or)

    (b) Write short note on ASCII character code.

12. (a) Explain with Diagram and truth table : Logic gates

    (Or)

    (b) Simplify the Boolean expression into minimum literals
    i) (XY+X(WZ+WZ')(2 marks)
    ii) A'B(D'+C'D)+B(A+A'CD)(3 marks)

13. (a) Write short note on full adder

    (Or)

    (b) Explain in detail BCD adder

14. (a) What is mean by SR Latch ? Explain with diagram

    (Or)

    (b) Write short note on JK flipflop.

15. (a) Draw the pin diagram of 8085 microprocessor and explain

    (Or)

    (b) What is mean by memory? How it is classified explain.

PART - C (3 X 10 = 30)
Answer any THREE Questions

16. Express the following numbers in Decimal
    a.$(101101.101)_2$ b. 25.8_{16} c.46.35_8 d.bdab.c_{16}
    e. 110101.110_2

17. Simplify the following using Karnuagh Map
    $F(W,X,Y,Z)=\Sigma(8,10,12,13,14)$

18. Explain in detail Encoders and Decoders

19. What is meant by Ripple and synchronous counter? Explain

20. Explain the Architecture of 8085 microprocessor with diagram.

ISLAMIAH COLLEGE [AUTONOMOUS], VANIYAMBADI
END SEMESTER EXAMINATIONS, JUNE - 2022

Time: 3 Hrs Max. Marks: 75

Subject: Digital Logic Fundamentals and Microprocessors
Subject Code: UACC1001

PART - A (10 X 2 = 20)
Answer ALL the Questions

1. What are the basic components of a digital computer?
2. Define Radix.
3. What is Boolean algebra?
4. What is don't care condition?
5. What is combinational circuit?
6. Define Encoder.
7. What is Flip flop?
8. Define Register.
9. What is Microprocessor?
10. What is Mnemonic?

PART - B (5 X 5 = 25)
Answer ALL the Questions

11. (a) Convert the following:
    i. $(65.535)_{10} = (?)_{16}$
    ii. $(23.6)_{10} = (?)_{2}$
    (Or)
    (b) Perform the subtraction with the following decimal numbers using 10's complement.
    i. 72532 – 03250
    ii. 03250 – 72532

12. (a) Convert the following expression in to SOP form.
    i. (A+B)(B'+C)(A'+C)
    ii. (A'+C)(A'+B'+C')(A+B')
    (Or)
    (b) Explain about digital logic gates with its truth table.

13. (a) Explain about the working principles of decoders.
    (Or)
    (b) Explain about Decimal adder with a neat diagram.

14. (a) Explain JK flip-flop with its characteristic table.
    (Or)
    (b) Write short notes on Shift Registers.

15. (a) Explain different types of memory classification.
    (Or)
    (b) Explain about memory mapped I/O addressing scheme.

PART - C (3 X 10 = 30)
Answer any THREE Questions

16. Explain in detail about Binary Codes with examples.

17. Simplify the Boolean function using K-Map method
    $F(w,x,y,z)=\sum(0,1,2,4,5,6,8,9,12,13,14)$

18. Explain in detail about Binary Adder/Subtractor with a neat diagram

19. Explain synchronous counters with a neat diagram.

20. Explain the architecture of 8085 with a neat diagram.