Reg. No. | | | | | | | | |

G. VENKATASWAMY NAIDU COLLEGE (AUTONOMOUS), KOVILPATTI – 628 502.

UG DEGREE END SEMESTER EXAMINATIONS - APRIL 2025.

(For those admitted in June 2023 and later)

PROGRAMME AND BRANCH: B.C.A.

SEM	CATEGORY	COMPONENT	COURSE CODE	COURSE TITLE
IV	PART-III	ELECTIVE GENERIC-4	U23CA4A4	DIGITAL LOGIC FUNDAMENTALS

Date & Session: 03.05.2025 / AN **Time : 3 hours** **Maximum: 75 Marks**

Course Outcome	Bloom's K-level	Q. No.	SECTION – A (10 X 1 = 10 Marks) Answer ALL Questions.
CO1	K1	1.	The code where all successive numbers differ from their preceding number by single bit is _____. a) Alphanumeric Code b) BCD c) Excess 3 d) Gray
CO1	K2	2.	Which of the following is a universal logic gate? a) AND b) OR c) NAND d) NOR
CO2	K1	3.	How many AND gates are required to realize Y = CD + EF + G? a) 2 b) 3 c) 4 d) 5
CO2	K2	4.	A Karnaugh map (K-map) is an abstract form of _____ diagram organized as a matrix of squares. a) Venn Diagram b) Cycle Diagram c) Block diagram d) Triangular Diagram
CO3	K1	5.	The expression Y=AB+BC+AC shows the _____ operation. a) EX-OR b) SOP c) POS d) NOR
CO3	K2	6.	Which of the following is not a binary number? a) 1111 b) 101 c) 11E d) 000
CO4	K1	7.	What could be the maximum value of a single digit in an octal number system? a) 8 b) 7 c) 6 d) 5
CO4	K2	8.	The binary number 1110 in hexadecimal format is _____. a) 6 b) E c) 14 d) 15
CO5	K1	9.	2's complement of 11001011 is _____. a) 01010111 b) 11010100 c) 00110101 d) 11100010
CO5	K2	10.	The basic building blocks of the arithmetic unit in digital computers are ____. a) Subtractors b) Adders c) Multiplexer d) Comparator
Course Outcome	**Bloom's K-level**	**Q. No.**	**SECTION – B (5 X 5 = 25 Marks) Answer ALL Questions choosing either (a) or (b)**
CO1	K3	11a.	Determine the function of AND gate and OR gate. **(OR)**
CO1	K3	11b.	Discover the function of NAND gate and NOR gate.

CO2	K3	12a.	Minimize the following algebraic equation using the Karnaugh Map K Map. $F = \bar{a}\bar{b}\bar{c} + \bar{a}\bar{b}c + a\bar{b}\bar{c} + a\bar{b}c$. **(OR)**
CO2	K3	12b.	Show Karnaugh Map K Map for the following equation and derive the simplified equation. F(A,B,C,D)= ∑m(7)+d(10,11,12,13,14,15)
CO3	K4	13a.	Convert 23.6 to a binary number. **(OR)**
CO3	K4	13b.	If binary numbers are given as 10101110, what are the steps to convert a given binary number to its decimal equivalent.
CO4	K4	14a.	If a hexadecimal number given as $(A2B)_{16}$ what are the steps to convert a given hexadecimal number to its binary equivalent. **(OR)**
CO4	K4	14b.	Show the 8-bit addition of these decimal numbers in 2's complement representation. a) +83, +16 b) +125,-68
CO5	K5	15a.	Express -19,750 in 2's complement representation, use hexadecimal notation to compress the data. **(OR)**
CO5	K5	15b.	Show how a half adder circuit can be realized.

Course Outcome	Bloom's K-level	Q. No.	**SECTION – C (5 X 8 = 40 Marks)** **Answer ALL Questions choosing either (a) or (b)**
CO1	K3	16a.	State and prove DeMorgan's laws using truth table and necessary logic circuits. **(OR)**
CO1	K3	16b.	How can we construct AND, OR, NOT using NAND and NOR gates. Explain.
CO2	K4	17a.	Simplify the following Boolean function in sum of product form F(A,B,C,D)= $\sum m(0,2,3,4,6,7,8,10,11,15)$ and draw the logic circuit. **(OR)**
CO2	K4	17b.	Analyze pair, quad and octets of K-map used to simplified the Boolean .
CO3	K4	18a.	Find the POS form and minimize it**.** F = Π(0 , 1 , 3) and draw the logic circuit. **(OR)** Analyze the binary to decimal conversion with suitable example.
CO3	K4	18b.	
CO4	K5	19a.	Convert the following. a)$(175)_{10}$ = (?)$_8$ b)$(0.23)_{10}$=(?)$_8$ c) $(F8E6.39)_{16}$=(?)$_{10}$ d) $(2479)_{10}$=(?)$_{16}$ **(OR)**
CO4	K5	19b.	Add these 16-bit numbers. 0000 1111 1010 1100 and 0011 1000 0111 1111. Show the corresponding hexadecimal and decimal numbers.
CO5	K5	20a.	Assess the function of full Adder circuit. **(OR)**
CO5	K5	20b.	Evaluate the function of binary adder- subtractor.