

Reg. No.

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



UG DEGREE END SEMESTER EXAMINATIONS - NOVEMBER 2025.

(For those admitted in June 2024 and later)

PROGRAMME AND BRANCH: B.Sc., COMPUTER SCIENCE

| SEM | CATEGORY | COMPONENT               | COURSE CODE | COURSE TITLE                  |
|-----|----------|-------------------------|-------------|-------------------------------|
| II  | PART-III | ELECTIVE<br>GENERIC - 2 | U24CS2A2    | DIGITAL LOGIC<br>FUNDAMENTALS |

Date &amp; Session: 11.11.2025/FN

Time : 3 hours

Maximum: 75 Marks

| Course Outcome | Bloom's K-level | Q. No. | SECTION – A (10 X 1 = 10 Marks)<br>Answer <u>ALL</u> Questions.                                                                                                                                                                                                                                               |
|----------------|-----------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1            | K1              | 1.     | The binary equivalent of decimal number 25 is _____.<br>a) 11001                      b) 10110                      c) 11101                      d) 10011                                                                                                                                                    |
| CO1            | K2              | 2.     | ASCII code is used to represent _____.<br>a) Images                      b) Numbers                      c) Characters                      d) Gates                                                                                                                                                          |
| CO2            | K1              | 3.     | Which of the following is a universal logic gate?<br>a) OR                      b) AND                      c) NAND                      d) XOR                                                                                                                                                               |
| CO2            | K2              | 4.     | In a Karnaugh map, grouping of <b>four adjacent 1's</b> is called _____.<br>a) Pair                      b) Quad                      c) Octet                      d) Loop                                                                                                                                   |
| CO3            | K1              | 5.     | A multiplexer is also called a _____.<br>a) Selector                      b) Distributor                      c) Decoder                      d) Encoder                                                                                                                                                      |
| CO3            | K2              | 6.     | The 2's complement of binary number 1010 is _____.<br>a) 0110                      b) 1010                      c) 0111                      d) 1110                                                                                                                                                          |
| CO4            | K1              | 7.     | The output of RS flip-flop is _____ when both inputs are high.<br>a) 1                      b) 0<br>c) Unpredictable (Invalid)                      d) High impedance                                                                                                                                         |
| CO4            | K2              | 8.     | In a JK flip-flop, when J=1 and K=1, the output will _____.<br>a) Remain 0                      b) Remain 1<br>c) Toggle                      d) Reset                                                                                                                                                        |
| CO5            | K1              | 9.     | A register that shifts data in both directions is called _____.<br>a) SISO                      b) PISO<br>c) Universal Shift Register                      d) SIPO                                                                                                                                           |
| CO5            | K2              | 10.    | In a parallel-in parallel-out (PIPO) register, data is _____.<br>a) Entered one bit at a time and exits one bit at a time<br>b) Entered all bits together and exits all bits together<br>c) Entered one bit at a time and exits all bits together<br>d) Entered all bits together and exits one bit at a time |

| Course Outcome | Bloom's K-level | Q. No. | <p align="center"><b>SECTION – B (5 X 5 = 25 Marks)</b><br/> <b>Answer <u>ALL</u> Questions choosing either (a) or (b)</b></p> |
|----------------|-----------------|--------|--------------------------------------------------------------------------------------------------------------------------------|
| CO1            | K3              | 11a.   | Explain the Gray Code with an example.<br><b>(OR)</b>                                                                          |
| CO1            | K3              | 11b.   | Convert the decimal number 45 to (i) binary (ii) octal (iii) hexadecimal.                                                      |
| CO2            | K3              | 12a.   | Simplify the Boolean expression using Karnaugh Map: $F(A,B,C) = \Sigma(1,3,5,7)$ .<br><b>(OR)</b>                              |
| CO2            | K3              | 12b.   | State and explain any two Boolean algebra laws with examples.                                                                  |
| CO3            | K4              | 13a.   | Explain the working of a 1-of-16 decoder.<br><b>(OR)</b>                                                                       |
| CO3            | K4              | 13b.   | Perform subtraction of $(1011)_2 - (0110)_2$ using 2's complement method.                                                      |
| CO4            | K4              | 14a.   | Explain the operation of an Edge-triggered D Flip-Flop with truth table.<br><b>(OR)</b>                                        |
| CO4            | K4              | 14b.   | Draw and explain the circuit of a JK Master-Slave Flip-Flop.                                                                   |
| CO5            | K5              | 15a.   | Explain the working of a Serial-in Parallel-out (SIPO) register.<br><b>(OR)</b>                                                |
| CO5            | K5              | 15b.   | Write short notes on Universal Shift Register.                                                                                 |

| Course Outcome | Bloom's K-level | Q. No. | <p align="center"><b>SECTION – C (5 X 8 = 40 Marks)</b><br/> <b>Answer <u>ALL</u> Questions choosing either (a) or (b)</b></p> |
|----------------|-----------------|--------|--------------------------------------------------------------------------------------------------------------------------------|
| CO1            | K3              | 16a.   | Explain different Number Systems with examples (Binary, Octal, Decimal, and Hexadecimal).<br><b>(OR)</b>                       |
| CO1            | K3              | 16b.   | Write short notes on Excess-3 Code and ASCII Code.                                                                             |
| CO2            | K4              | 17a.   | Explain the procedure to minimize Boolean expressions using K-map with an example.<br><b>(OR)</b>                              |
| CO2            | K4              | 17b.   | Discuss the Sum of Products and Product of Sums methods of simplification.                                                     |
| CO3            | K4              | 18a.   | Explain the working of a Multiplexer with neat diagram.<br><b>(OR)</b>                                                         |
| CO3            | K4              | 18b.   | Explain Seven-Segment Decoder with truth table and diagram.                                                                    |
| CO4            | K5              | 19a.   | Explain the different types of Flip-Flops (RS, JK, D, T) with truth tables.<br><b>(OR)</b>                                     |
| CO4            | K5              | 19b.   | Write short notes on JK Flip-Flop Toggle condition and D Flip-Flop edge triggering.                                            |
| CO5            | K5              | 20a.   | Explain the different types of Registers with diagrams.<br><b>(OR)</b>                                                         |
| CO5            | K5              | 20b.   | Write short notes on Serial-in Serial-out (SISO) and Parallel-in Serial-out (PISO) registers.                                  |