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| **University of Kerala** | | |
| Discipline: Computer Science |  | Time: 1 Hour 30 Minutes (90 Mins.) |
| Course Code: UK1DSCCSC102 |  | Total Marks: 42 |
| Course Title: Digital Electronics |  |  |
| Type of Course: DSC |  |  |
| Semester: 1 |  |  |
| Academic Level: 100-199 |  |  |
| Total Credit: 3, Theory: 3 Credit |  |  |

Part A. 6 Marks. Time: 6 Minutes

Objective Type. 1 Mark Each. Answer All Questions

(Cognitive Level: Remember/Understand)

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| **Qn.**  **No.** | **Question** | **Cognitive**  **Level** | **Course**  **Outcome (CO)** |
| 1. | Name the basic logic gates. | Remember | CO1 |
| 2. | Define SOP? | Remember | CO3 |
| 3. | Draw a D-flip flop. | Understand | CO4 |
| 4. | List any two laws of Boolean Algebra | Understand | CO3 |
| 5. | How many cells are required for simplification of a 2 variable Boolean expression using K- map? | Understand | CO3 |
| 6. | Write the binary representation of the decimal number 13? | Understand | CO1 |

Part B. 8 Marks. Time: 24 Minutes

Short Answer. 2 Marks Each. Answer All Questions

(Cognitive Level: Understand/Apply)

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| **Qn.**  **No.** | **Question** | **Cognitive**  **Level** | **Course**  **Outcome (CO)** |
| 7. | Show the difference between Minterm and Maxterm in Boolean algebra with the help of an example? | Understand | CO3 |
| 8. | Draw the truth table for an NOR gate. | Understand | CO2 |
| 9. | Prepare a list of any four applications of logic gates? | Apply | CO2 |
| 10. | How does a Multiplexer work? | Apply | CO4 |

Part C. 28 Marks. Time: 60 Minutes

Long Answer. 7 marks each. Answer all 4 Questions, choosing among options within each question.

(Cognitive Level: Apply/Analyse/Evaluate/Create)

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| **Qn.**  **No.** | **Question** | **Cognitive**  **Level** | **Course**  **Outcome (CO)** |
| 11. | (a)Describe the working of XOR and XNOR gates with their truth tables.  OR  (b)Discuss the universal property of NAND and NOR gates in detail. | Apply | CO2 |
| 12. | (a) Differentiate a full adder and a half adder.  OR  (b) Describe the working of SR, D, and T flip-flops with truth tables and diagrams. | Analyze | CO4 |
| 13. | (a) Explain how a Karnaugh map (K-map) is used to simplify Boolean expressions.  OR  (b) Explain the distributive, commutative, and associative laws in Boolean algebra with examples. | Evaluate | CO3 |
| 14. | (a) Discuss the 1's and 2's complement method for binary subtraction with examples.  OR  (b) Convert 100111 from binary to decimal, octal, and hexadecimal. | Create | CO1 |

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| **Cognitive Level** | **Marks** | **Percentage** |  | **Course Outcomes** | **Marks** | **Percentage** |
| Remember |  |  |  |  |  |  |
| Understand |  |  |  |  |  |  |
| Apply |  |  |  |  |  |  |
| Analyse |  |  |  |  |  |  |
| Evaluate |  |  |  |  |  |  |
| Create |  |  |  |  |  |  |
| **TOTAL** | **42** | **100** |  | **TOTAL** | **56** | **100** |