



Reg. No.:

Name:

University of Kerala

First Semester FYUGP Degree Examination, December 2025

Discipline Specific Core Course

COMPUTER SCIENCE

UK1DSCCSC102 - Digital Electronics

Academic Level: 100-199

2024 Admission onwards

Time: 1 Hour 30 Minutes(90 Mins.)

Max. Marks: 42

**Part A. 6 Marks.Time:6 Minutes.(Cognitive Level:Remember(RE)/Understand(UN)) Objective Type. 1 Mark
Each.Answer all questions**

Qn No.	Question	CL	CO
1	In XOR gate, the output will ____ when both inputs are different.	RE	2
2	Show the Boolean expression for A OR B.	RE	3
3	Write the binary representation of the Octal number 13?	UN	1
4	Discuss the difference between Half Adder and Full Adder.	UN	4
5	Write the binary representation of the decimal number 17.	UN	1
6	Find the decimal number of the BCD number 1001 0110.	UN	1

Part B.8 Marks.Time:24 Minutes.(Cognitive Level:Understand(UN)/Apply(AP))Short Answer. 2 marks each.Answer all questions

Qn No.	Question	CL	CO
7	Discuss De -Morgan's theorem.	UN	3
8	Describe flip-flop and state its basic function in sequential circuits.	UN	4
9	Solve by binary addition: 1011 + 0110	AP	1
10	Draw a logic circuit using only NOR gates for the Boolean function: $F = A + B'C.$	AP	2

Part C. 28 Marks.Time:60 Minutes (Cognitive Level:Apply(AP)/Analyse(AN)/Evaluate(EV)/Create(CR)) Long Answer.7 marks each.Answer all 4 Questions choosing among options * within each question

Qn No.	Question	CL	CO
11	<p>A)</p> <p>Apply K-Map simplification to design a minimal circuit for:</p> <p>$F(A,B,C) = \Sigma(0,1,5,6,7)$.</p> <p>OR</p> <p>B)</p> <p>Solve using 4-variable K-map:</p> <p>$F(A,B,C,D) = \Sigma(0,1,2,5,7,8,10,14)$</p>	AP	3, 3
12	<p>A)</p> <p>Analyse the internal functional difference between Encoder, Decoder, Multiplexer and Demultiplexer using block diagrams.</p> <p>OR</p> <p>B)</p> <p>Analyze the working of JK flip-flop with a truth table and diagram.</p>	AN	4, 4
13	<p>A)</p> <p>Evaluate the performance of Half Adder vs Full Adder in multi-bit addition circuits.</p> <p>OR</p> <p>B)</p> <p>Assess the usefulness of 74-series ICs in modern digital design</p>	EV	3, 3
14	<p>A)</p> <p>Create a logic circuit using multiplexers to implement a Boolean expression.</p> <p>OR</p> <p>B)</p> <p>Develop a digital circuit which can add three bits and produce the output as Sum and Carry.</p>	CR	4, 4