BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION SP/2025)

CLASS: BCA **SEMESTER : II**
BRANCH: BCA **SESSION : SP/2025**

SUBJECT: CN123 BASICS OF DIGITAL COMPUTER AND LOGIC DESIGN

TIME: 02 Hours **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1(a)	What do mean by digital computer? Explain it with suitable diagram.	[2]	1	1
Q.1(b)	Convert the following numbers from the given base to the bases indicated: (i) decimal 125.125 to binary, octal, and hexadecimal. (ii) binary 1101010.001 to decimal, octal, hexadecimal. (iii) Hexadecimal 2AC5.D to decimal, octal, and binary.	[3]	1	5
Q.2(a)	Explain all the digital gates with their graphical symbol, algebraic function and also truth table.	[2]	1	1
Q.2(b)	Simplify the following Boolean functions to a minimum number of literals. (i) xy + x'z + yz (ii) xy + xz + yz'	[3]	2	3
Q.3(a)	What is K-map. How do you construct a K-Map for a given Boolean function of 4 variables?	[2]	3	1
Q.3(b)	Simplify the Boolean function: F (A, B, C) = Σ (0, 2, 4, 5, 6) and design a circuit diagram for the simplified function.	[3]	3	3
Q.4(a)	Obtain the simplified expression in sum of product for following Boolean function using k-map. ABD +A'C'D' +A'B +A'CD' +AB'D'	[2]	3	5
Q.4(b)	Simplify the Boolean function F together with the don't care conditions *d* in (i) sun-of-product form and (ii) product-of-sum form F(w, x, y, z) = Σ (0, 1, 3, 7, 8, 10) *d*(w, x, y, z) =Σ (5, 6, 11, 15)	[3]	3	5
Q.5(a)	Define Combinational circuit with block diagram.	[2]	1	1
Q.5(b)	Design a full adder combinational circuit with two half adder circuit and an OR gate.	[3]	4	4

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