

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)**

**CLASS: BCA
BRANCH: BCA**

**SEMESTER: I
SESSION: MO/2022**

SUBJECT: CA103 LOGICAL ORGANIZATIONS OF COMPUTERS

TIME: 2 HOURS

FULL MARKS: 25

INSTRUCTIONS:

1. The total marks of the questions are 25.
 2. Candidates attempt for all 25 marks.
 3. Before attempting the question paper, be sure that you have got the correct question paper.
 4. The missing data, if any, may be assumed suitably.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
-

		CO	BL
Q1 (a)	Explain in brief about the digital computer with a diagram.	[2] CO1	2
Q1 (b)	List all digital gates with suitable graphical symbols and truth tables.	[3] CO1	1
Q2 (a)	Simplify the Boolean function F together with the don't - care conditions d in sum-of-products form $F(A, B, C, D) = \Sigma(0, 1, 2, 3, 7, 8, 10)$ $d(A, B, C, D) = \Sigma(5, 6, 11, 15)$	[3] CO1	5
Q2 (b)	Design and explain a Full Adder combinational circuit.	[3] CO2	3
Q3 (a)	Differentiate between combination circuits and sequential circuits with suitable diagrams.	[2] CO1	2
Q3 (b)	Explain and design a 3 x 8-line decoder circuit.	[3] CO2	3
Q4 (a)	What do you mean by complements? Explain.	[2] CO1	2
Q4 (b)	What is a Register? Design a 4-bit right shift register?	[3] CO2	2
Q5 (a)	Convert the hexadecimal number F3A7C2 to binary and octal numbers.	[2] CO2	5
Q5 (b)	Perform the operation of subtractions with the following binary numbers using 2' complement (i) 10111 - 10001 (ii) 000100 - 110000	[3] CO2	5

::: 26/09/2022 :::M