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

CLASS:B TECH **SEMESTER : III**
BRANCH: CS **SESSION : MO/2025**

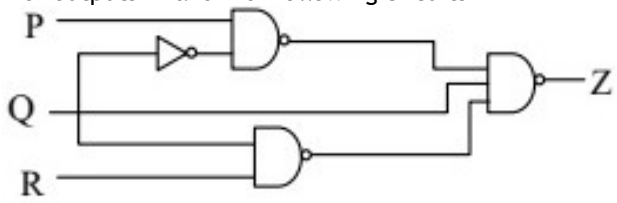
SUBJECT: CS24203 MATHEMATICS FOR COPUTER SCIENCE

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

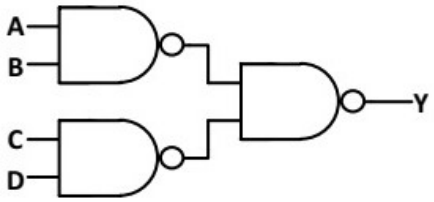
INSTRUCTIONS:

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)	Suppose an unordered list contain 'n' distinct elements. The number of comparisons to find an element in this list that is neither maximum nor minimum. Write this in with respect to growth functions notation and explain how you achieve the result	[2]	1	1
Q.1(b)	Find the constants for the function f(n)= 1+2+3+4+…….+ n	[3]	1	3
Q.2(a)	Define a Polynomial. Differentiate between a monomial and a trinomial. Find the zero (s) of the following polynomials: a. x3 + 3x2 + 3x + 2 b. x4 – 4x3 + 6x2 – 4x + 1	[2]	1	1
Q.2(b)	Perform division on the following polynomials: a. 5x – 11 – 12x2 + 2x3 by 2x – 5 b. 2x2 + 5x + 3 by 2x + 3	[3]	1	3
Q.3(a)	Write expression for outputs Y and Z of following circuits	[2]	1	3



(a)



(b)

Q.3(b)	Solve the function mentioned in its SOP form using k-map and design a circuit for the same F(A, B, C, D)= ∑(0,2,5,7,8,10,13,15)	[3]	1	3
Q.4(a)	We are given a set of n 9 digit natural numbers with no leading o's and no repetition of digits. a. Find the value of n b. Find how many of them are divisible by 2	[2]	2	3
Q.4(b)	State Multiplication Principle Using it prove that the number of subsets of a finite set with n elements is 2^n	[3]	2	4
Q.5(a)	State and prove Pascal Identity. How is it applied to form a Pascal Triangle	[2]	2	4
Q.5(b)	Let Ω be a sample space with a probability density p and let E and F are two subsets of Ω. Prove that P(E U F) = P(E) + P(F) - P(E n F) Calculate the probability of a card drawn at random from a 52-card deck will be an Ace or a spade.	[3]	2	2

:::::19/09/2025 ::::E