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

CLASS: BTECH **SEMESTER : IV**
BRANCH: CHEMICAL/EEE/MECH **SESSION : SP/2023**

SUBJECT: MA308 DIFFERENCE EQUATIONS

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Construct a difference equations from the function $y_k = (c_1 + c_2 k)2^k.$	[5]	CO1	1.10 1.12
Q.1(b)	Calculate the first difference of $(a + bk)^{(n)}$, where *a* and *b* are constants.	[5]	CO3	1.11 1.32
Q.2(a)	Find a solution of the nonhomogeneous equation $y_{k+1} - \beta y_k = \alpha.$	[5]	CO1	1.11 1.12
Q.2(b)	Find a solution of the nonhomogeneous equation $y_{k+1} - y_k = 1 - k + 2\ \ k^3.$	[5]	CO2	1.21 1.31
Q.3	Describe linear dependence and linear independence of functions and their applications to a second order linear difference equation. Give examples to claim your statements.	[10]	CO4 CO5	1.24 1.25
Q.4(a)	Find solutions of Fibonacci difference equation $y_{k+2} = y_{k+1} + y_k$ with suitable initial conditions.	[5]	CO3	1.22 1.23
Q.4(b)	Find a solution to the equation $y_{k+2} - 6y_{k+1} + 8y_k = 2 + 3k^2 - 5\ .\ 3^k.$	[5]	CO4	1.23 1.30
Q.5(a)	Solve the equation $z(k+1, l+1) - z(k, l+1) - z(k, l) = 0.$	[5]	CO5	1.31 1.32
Q.5(b)	Find a solution of the equation $z(k+1, l) - 2z(k, l+1) - 3z(k, l) = 0$ using Lagrange's method.	[5]	CO5	1.31 1.32

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