

Name row. col....

1.	2.	3.	4.	5.	Σ.

1. Order the following functions by asymptotic growth rates. Explain Your answer $\ln^n 3, n^{\ln 2}, n^{\ln 3}$
2. Use generating functions to find a_n if: $a_n = 4a_{n-1} - 3a_{n-2} - 1$ and $a_0 = 2, a_1 = 4$.
3. Find a coefficient of x^{39} in $(1 + x + x^2 + x^3 + x^4 + x^5)(1 + x^2 + x^4 + x^6 + \dots)^3$.
4. A code is given by generator matrix: $\begin{bmatrix} 1011110 \\ 0000111 \\ 0101011 \end{bmatrix}$. This code detects ... errors and corrects ... errors.
Is it perfect? Find the parity check matrix. What was sent if at most one error has arisen during the transmission and the received word is a) 0101100 b) 0110010
5. Prove or disprove. If a graph has 5 edge disjoint spanning trees then it has at least 10 vertices.