KATHMANDU UNIVERSITY
Dulikhel, Kavre
Internal Examination I - 2024

Subject: **MCSC- 201**
Group: CE

Time: 60 min
F.M. : 20

Attempt all questions.

1. Let a, b, c be integer, a | b or a | c then prove that a | bc. Also, use Euclidian algorithm to find GCD of 273 and 98 and express it as combination of given numbers. [1 + 3]

2. Define binary operation and Unary operation. If * is an associative operation and y is inverse of x then prove that y is unique. [2 + 2]

3. Define the characteristic function and prove that:
$f_{A \cap B} = f_A + f_B - 2f_A f_B$, symbols have their usual meaning. [1+3]

4. What is Mathematical Induction method? Use Mathematical Induction to prove that:
$n! \geq 2^{n-1}$ for all $n \geq 1$. [1+ 3]

5. Define tautology and logically equivalent. Show that the statement $(p \wedge q) \rightarrow q$ is a tautology. [2 + 2]

$(p \wedge q) \Rightarrow q$