National University of Computer and Emerging Sciences, Lahore Campus				
	Course:	**Probability and Statistics**	**Course Code:**	**MT2005**
	Program:	**BS(Computer Science)**	**Semester:**	**Spring-2025**
	Instructor:	**Ms. Kanwal Saleem**	**Total Marks:**	**15**
	Submission Date:	**24-03-2024**	**Weight**	**4%**
	Section:	**BCS-4F**	**Page(s):**	**2**
	Evaluation	**Assignment-2 (Graded)**		
Instruction/Notes:	**Attempt All Questions**			

QUESTION 1 **(Marks=4)**

A cyber security team monitors four different firewall checkpoints within a corporate network to detect unauthorized access attempts**.** The firewalls at locations F1, F2, F3, and F4 are active 40%, 30%, 20%, and 30% of the time, respectively. A hacker attempting to breach the system has probabilities of 0.2, 0.1, 0.5, and 0.**2**, respectively, of trying to access the network through these checkpoints. How likely is it that the hacker's intrusion attempt will be detected?

QUESTION 2 **(Marks=5+6)**

A network security system monitors incoming data packets and assigns them a risk score based on two independent security checks. Each check assigns a risk score between 1 and 6, and the total risk score is the sum of both checks.

If a risk score of less than 7 is considered low risk, determine:

1. The probability distribution of the total risk score for low-risk cases.
2. The cumulative distribution function (CDF) for these risk scores.