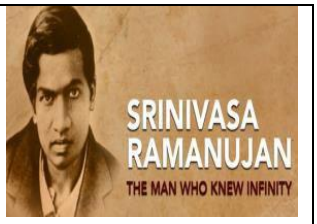
	SRM Institute of Science and Technology Kattankulathur	
	DEPARTMENT OF MATHEMATICS	
	18MAB203T Probability and Stochastic Processes	
	Module – III **Tutorial Sheet - VII**	

Sl.No.	Questions	Answer
	Part – B	
1	A random variable X has mean 10 and variance 16. Find a lower bound for P(5<X<15)	9/25
2	A random variable X has mean 10 and variance 16. Find an upper bound for $P\left(\left\|X-10\right\|\geq 15\right)$.	16/25
3	If Chebyshev's inequality for a random variable X with mean 12 is P(6<X18)$\geq 3/4$,find the variance of X.	9
4	If Chebyshev's inequality for a random variable is $P(-2<X<8)\geq 21/25$ .Find E (X) and V(X).	(i) E(X) =3 (ii) V(X) = 4
5	A coin is weighted so that its probability of landing on heads is 20%. Suppose the coin is flipped 20 times. Find the bound for the probabilities if lands on heads at least 16 times.	1/4
	Part – C	
6	If X has a distribution with pdf $f(x)=e^{-x}$, $0\leq x<\infty$. Use Chebyshev's inequality to obtain a lower bound to the probability $P(-1\leq X\leq 3)$ and compare it with actual value.	(i) ¾ (ii) $1-e^{-3}$
7	The number of planes landing at an airport in a 30 minutes interval obeys the Poisson law with mean 25. Use Chebyshev's inequality to find the least chance that the number of planes landing within a given 30 minutes interval will be between 15 and 25.	(i) 3/4
8	Two dice are thrown once. If X is the sum of the numbers showing up. Prove that $P\{\left\|X-7\right\|\geq 3\}\leq 35/54$ and compare this value with the exact probability.	4/9
9	A Pair of dice be rolled 900 times and X denote the number of times a total of 9 occurs. Find $P\{80\leq X\leq 120\}$, using Chebyshev's inequality	2/9
10	How large a sample must be taken in order that the probability will be at least 0.95 that $\bar{X}_n$ will be within 0.5 of μ (μ is unknown and $\sigma=1$)	$n\geq 80$