SRM INSTITUTE OF SCIENCE & TECHNOLOGY	**SRM Institute of Science and Technology** **Department of Mathematics** **18MAB204T-Probability and Queueing Theory** **Module – I** **Tutorial Sheet - 3**

S.No.	Questions
	Part – A
1	A random variable X has mean 10 and variance 16. Find an upper bound for $P(\|X-10\| \geq 15)$
2	If X is a R.V with $E(X)=3$ and $E(X^2)=13$, find the lower bound for $P(-2<X<8)$, using Tchebycheff's inequality.
3	If the Tchebycheff's inequality for a R. V X with SD 3 is $P(6<X<18) \geq \frac{3}{4}$, find the mean of X.
4	A discrete R.V X takes the values $-a, 0, a$ with probabilities $\frac{1}{8}, \frac{3}{4}, \frac{1}{8}$ respectively. Compute $P(\|X-\mu\| \geq 2\sigma)$ using Tchebycheff's inequality.
	Part - B
5	An unbiased coin is tossed 100 times. Use Tchebycheff's inequality to find a lower bound for the probability of getting 30 to 70 fours.
6	A random variable X has pdf $f(x)=e^{-x}, x \geq 0$. Use Tchebycheff's inequality to find $P(\|X-1\|>1)$ and compare it with the actual probability.
7	Use Tchebycheff's inequality to prove that in 1000 throws with a coin the probability that the number of heads lies between 450 and 550 is at least $\frac{9}{10}$.
8	Using Tchebycheff's inequality, find how many times a fair coin must be tossed in order that the probability that the ratio of the number of heads to the number of tosses will lie between 0.4 and 0.6 will be atleast 0.9