

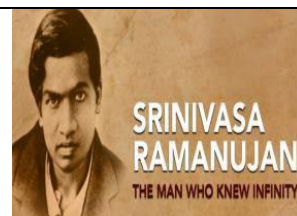


**SRM Institute of Science and Technology
Kattankulathur**

DEPARTMENT OF MATHEMATICS

**18MAB203T Probability and Stochastic
Processes**

**Module – III
Tutorial Sheet - VIII**



Sl.No.	Questions	Answer
Part – B		
1	Assume 75 i.i.d Poisson variates with parameter $\lambda = 2$. Find $P(120 \leq X \leq 160)$ where X is sum of the variates.	0.7868
2	Suppose X_1, X_2, \dots, X_{10} are independent identically distributed random variables with common mean 10 and variance 4. Using CLT, find $P[S_n \geq 100]$	0.057
3	Let X be an exponential random variable of burning of certain type of lamp, with mean 30. what is the probability that 144 of these lamps will provide a total of more than 4500 hours of burning time?	0.3085
4	Two fair dice are tossed 600 times. Let X denote the number of times a total of 7 occurs. Using CLT find $P\{90 \leq X \leq 110\}$	0.0726
5	A lifetime of a particular variety of electric bulb may be considered as a random variable with mean 1200 hours and standard deviation 250 hours. Using central limit theorem find the probability that the average lifetime of 60 bulbs exceeds 1250 hours.	0.0606
Part – C		
6	A sample of size 100 is taken from a population whose mean is 60 and variance is 400. Using CLT with what probability can we assert that the mean of the sample will not differ from $\mu = 60$ by more than 4.	0.9544
7	A distribution with unknown mean μ has variance equal to 1.5. Use central limit theorem to find how large a sample should be taken from the distribution in order that the probability will be at least 0.95 that the sample mean will be within 0.5 of the population mean.	At least 24
8	An unbiased die is rolled 300 times. What is the probability that the number of outcomes which are odd will be between 140 and 150?	0.3749
9	In a particular circuit, 20 resistors are connected in series. The mean and variance of each resistor is 5 and 0.2 respectively. What is the probability that the total resistance of the circuit will exceed 98?	0.8413