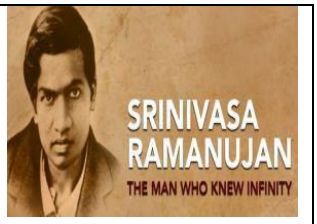
SRM INSTITUTE OF SCIENCE & TECHNOLOGY (Deemed to be University u/s 3 of UGC Act, 1956)	**SRM Institute of Science and Technology Kattankulathur** **DEPARTMENT OF MATHEMATICS** **18MAB203T Probability and Stochastic Processes** **Module – I: Random Variables** **Tutorial Sheet - III**	

Sl.No.	Questions	Answer
	Part – B	
1	The time required to complete a work is an exponential distributed RV with $\lambda = 1/2$. What is the probability that time to complete the work exceeds 2 hrs?	(i) $P(X > 2) = e^{-1}$
2	In a distribution exactly normal 7% of the items are under 35 and 89% are under 63. what are the mean and standard deviation of the distribution?	(i) 50.3 (ii) 10.33
3	If a random variable X follows normal distribution with mean 28 and variance 625 find (i) P (32 < X < 68) (ii) P (X < 68 /X > 32).	(i) 0.3816 (ii) 0.8739
4	Given the R.V X with density function $f(x) = \begin{cases} 2x, & 0 < x < 1 \\ 0, & otherwise \end{cases}$ Find the PDF of Y=8 X^3	$f_Y(y) = \frac{1}{6} y^{-\frac{1}{3}} \quad 0 < y < 8$
5	Let $Y = X^2$ .Find the PDF of Y if X has Pdf $f_X(x) = \begin{cases} \frac{1}{3} & -1 < x < 2 \\ 0 & otherwise \end{cases}$	$f_Y(y) = \begin{cases} \frac{1}{3\sqrt{y}} & 0 < y < 1 \\ \frac{1}{6\sqrt{y}} & 1 < y < 4 \\ 0 & otherwise \end{cases}$
	Part – C	
6	The time required to repair a machine is exponentially distributed with parameter ½. what is the probability that the repair exceeds 2 hours? what is the conditional probability that the repair takes at least 10 hours given that the duration exceeds 9 hours?	(i) 1/e (ii) 0.6

<table>
<tr><td>7</td><td>X is normally distributed and the mean of X is 12 and standard deviation is 4. Find the probability of the following (i) $X \geq 20$ (ii) $0 \leq X \leq 12$ (iii) Find x when P (X >x) =0 .24</td><td>(i) 0.0228
(ii) 0.49865
(iii) 14.8</td></tr>
<tr><td>8</td><td>Find the first four raw moments and central moments of $f(x) = kx(2-x), \quad 0 \leq x \leq 2.$</td><td>(i) 0
(ii) 1/5
(iii) 0
(iv) 3/35</td></tr>
<tr><td>9</td><td>If $f(x) = Ce^{-ax}$ a>0, x ≥ 0 is a pdf, then find C and the first 3 moments about mean</td><td>(i) C= a
(ii) 0
(iii) $\frac{1}{a^2}$
(iv) $\frac{2}{a^3}$</td></tr>
<tr><td>10</td><td>Find the first three moments of X ,If X has the following distribution
<table>
<tr><td>x</td><td>-2</td><td>1</td><td>3</td></tr>
<tr><td>P(x)</td><td>1/2</td><td>1/4</td><td>1/4</td></tr>
</table></td><td>(i) 0
(ii) 9/2
(iii) 3</td></tr>
</table>