MANIPAL INSTITUTE OF TECHNOLOGY
BENGALURU
(A constituent unit of MAHE, Manipal)

ASSIGNMENT

Engineering Mathematics IV (MAT_2226/MAT_2256)

Due Date: 10.04.2025 **Max marks: 10 MARKS**

1. Find the moment generating function of Normal Distribution and hence find its mean and variance.

2. Find the moment generating function of exponential distribution and hence find its mean and variance.

3. Find the moment generating function of Gamma Distribution and hence find its mean and variance.

4. Find the moment generating function of Chi-square Distribution and hence find its mean and variance.

5. Find the moment generating function of Uniform Distribution and hence find its mean and variance.

6. Let X and Y be two independent random variables with pdf's $f(x) = e^{-x}, x > 0$ and $g(y) = 2e^{-y}, y > 0$. Find the pdf of the random variable $Z = \frac{X}{Y}$.

7. If the continuous random variable X is uniformly distributed in (-2,2), find the pdf of $Y = 6 - X^2$.

8. If X has pdf $f(x) = \lambda e^{-\lambda(x-a)}$ if $x \geq a$. Find its mgf and also find the mean and variance.

9. Let S^2 be the variance of a random sample of size 6 from the $N(\mu, 12)$ then find $\Pr\{2.3 < S^2 < 22.2\}$.

10. Show that for the normal distribution with mean μ and variance σ^2, $E[(X-\mu)^{2n}] = 1.3.5.7 \cdots (2n-1)\sigma^{2n}$.

Note:

1. Submit the soft copy of the assignment in LMS on or before due date.
2. Mention name, registration number, branch properly in first page of your assignment.
3. Late submissions are subjected to mark deduction.