Unit 7 - Week 6

Assignment 6

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-03-11, 23:59 IST.

1) Which of the following statements is/are true? *1 point*

- [ ] If two Random variables have the same moment generating function, then they have identical distributions
- [ ] If two Random variables have the same probability generating function, then they have identical distributions
- [ ] If two Random variables have the same characteristic function, then they have identical distributions.
- [ ] If two Random variables have the same mean, then they have identical distributions

No, the answer is incorrect.
Score: 0

Accepted Answers:
If two Random variables have the same moment generating function, then they have identical distributions
If two Random variables have the same probability generating function, then they have identical distributions
If two Random variables have the same characteristic function, then they have identical distributions.

2) What are the conditions required to define a Probability Generating Function for the random variable X? *1 point*

- [ ] X should be non-negative
- [ ] X should be continuous type random variable
- [ ] X should be discrete type random variable
- [ ] X should only take integer values

No, the answer is incorrect.
Score: 0

Accepted Answers:
X should be non-negative
X should be discrete type random variable
X should only take integer values

3) Find the probability generating function of a binomial distributed random variable with parameters n and p *1 point*

- $(pt+1-p)^n$
- $(pt - p)^n$
- $(pt + 1)^n$
- $(t + 1 - p)^n$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$(pt+1-p)^n$

4) Find P{X=k} in terms of the probability generating function of X *1 point*

- $k!\frac{d^kG_x(t)}{(dt)^k}\Big|_{t=0}$
- $\frac{1}{k!}\frac{d^{k+1}G_x(t)}{(dt)^{k+1}}\Big|_{t=0}$
- $\frac{1}{k!}\frac{d^kG_x(t)}{(dt)^k}\Big|_{t=1}$
- $\frac{1}{k!}\frac{d^kG_x(t)}{(dt)^k}\Big|_{t=0}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\frac{1}{k!}\frac{d^kG_x(t)}{(dt)^k}\Big|_{t=0}$

5) Find the moment generating function of a exponential distributed random variable with parameter λ *1 point*

- $\frac{\lambda-t}{\lambda}\ \forall t \in (-\infty, \lambda)$
- $\frac{\lambda}{t}\ \forall t \in (-\infty, \lambda)$
- $\frac{\lambda}{\lambda-t}\ \forall t \in (-\infty, \lambda)$
- $\frac{\lambda}{\lambda-t}\ \forall t \in (-\infty, +\infty)$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\frac{\lambda}{\lambda-t}\ \forall t \in (-\infty, \lambda)$

6) Find P{X=0} if $M_X(t) = \frac{e^t}{2} + \frac{e^{-t}}{3} + \frac{1}{6}$ *1 point*

- $\frac{1}{3}$
- $\frac{1}{6}$
- $\frac{1}{2}$
- $\frac{1}{4}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\frac{1}{6}$

7) If $X_1, X_2, ..., X_n$ are mutually independent normal random variables with means $\mu_1, \mu_2, ..., \mu_n$ and variances $\sigma_1, \sigma_2, ..., \sigma_n$ then find the distribution of the linear combination $Y = \sum_{i=1}^{n} c_i X_i$. *1 point*

- Normal distribution
- Binomial distribution
- Chi Square distribution
- Exponential distribution

No, the answer is incorrect.
Score: 0

Accepted Answers:
Normal distribution

8) Which of the following statements is/are true ($\psi_X(t)$ is the characteristic function of the random variable X) ? *1 point*

- $|\psi_X(t)| \geq 2$
- $|\psi_X(t)| \leq 1$
- $|\psi_x(t)| = 2$
- $|\psi_x(t)| > 1$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$|\psi_X(t)| \leq 1$

9) Which of the following statements is/are true? *1 point*

- Characteristic function of a random variable always exists and moment generating function may or may not exist
- Characteristic function of a random variable always exists and moment generating function also exists always
- Characteristic function of a random variable may or may not exist and moment generating function may or may not exist
- Characteristic function of a random variable may or may not exist and moment generating function always exists

No, the answer is incorrect.
Score: 0

Accepted Answers:
Characteristic function of a random variable always exists and moment generating function may or may not exist

10) Let $X_1, X_2, and X_3$ denote a random sample of size 3 from a gamma distribution with $\alpha = 7$ and $\theta = 5$ Let Y be the sum of the three random variables. Find the distribution of Y. *1 point*

- Gamma distribution with $\alpha = 7$ and $\theta = 5$
- Gamma distribution with $\alpha = 7$ and $\theta = 25$
- Gamma distribution with $\alpha = 21$ and $\theta = 5$
- Exponential distribution with $\lambda = 7$

No, the answer is incorrect.
Score: 0

Accepted Answers:
Gamma distribution with $\alpha = 21$ and $\theta = 5$