

National Testing Agency

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Probability and Statistics

Group Number :	1
Group Id :	899514105
Group Maximum Duration :	0
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Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	100
Is this Group for Examiner? :	No

Probability and Statistics

Section Id :	899514129
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	100
Number of Questions to be attempted :	100

Section Marks : 100
Mark As Answered Required? : Yes
Sub-Section Number : 1
Sub-Section Id : 899514161
Question Shuffling Allowed : Yes

Question Number : 1 Question Id : 8995149309 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

If X is a random variable, then

1. $E(X^2) = (E(X))^2$
2. $E(X^2) \geq (E(X))^2$
3. $E(X^2) \leq (E(X))^2$
4. none of the above

Options :

89951436698. 1
89951436699. 2
89951436700. 3
89951436701. 4

Question Number : 2 Question Id : 8995149310 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

If X is a r.v. having the pdf $f(x)$, then the reciprocal of $E(1/X)$ is

1. Arithmetic mean
2. Harmonic mean
3. Harmonic mean
4. First quartile

Options :

89951436702. 1
89951436703. 2
89951436704. 3
89951436705. 4

Question Number : 3 Question Id : 8995149311 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The mgf of a r.v. X is $MX(t) = \frac{2}{5} + \frac{1}{3}e^{2t} + \frac{4}{15}e^{3t}$.

The expected value of X is

1.22/15

2.9/5

3.17/15

4.21/15

Options :

89951436706. 1

89951436707. 2

89951436708. 3

89951436709. 4

Question Number : 4 Question Id : 8995149312 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If X is a r.v having the pdf f(x), E(logX) will lead to

1.Arithmetic mean

2.Harmonic mean

3.Geometric mean

4.Logarithmic mean

Options :

89951436710. 1

89951436711. 2

89951436712. 3

89951436713. 4

Question Number : 5 Question Id : 8995149313 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Geometric mean of two numbers $1/16$ and $4/25$ is

- 1. $1/10$
- 2. $1/100$
- 3. 10
- 4. 100

Options :

- 89951436714. 1
- 89951436715. 2
- 89951436716. 3
- 89951436717. 4

Question Number : 6 Question Id : 8995149314 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If A and B are two events which have no point in common, then the events

A and B are

- 1. complementary to each other
- 2. independent
- 3. mutually exclusive
- 4. dependent

Options :

- 89951436718. 1
- 89951436719. 2
- 89951436720. 3
- 89951436721. 4

Question Number : 7 Question Id : 8995149315 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If two events A and B are such that $A \subset B$ and $B \subset A$, then the relation between $P(A)$ and $P(B)$ is

- 1. $P(A) \leq P(B)$
- 2. $P(A) \geq P(B)$
- 3. $P(A) = P(B)$
- 4. none of the above

Options :

- 89951436722. 1
- 89951436723. 2
- 89951436724. 3
- 89951436725. 4

Question Number : 8 Question Id : 8995149316 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

If $\mu_1 = 0$, $\mu_2 = 2$ and $\mu_3 = 4$, then β_1 is

- 1. 0
- 2. 1
- 3. 0.5
- 4. 2

Options :

- 89951436726. 1
- 89951436727. 2
- 89951436728. 3
- 89951436729. 4

Question Number : 9 Question Id : 8995149317 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Given the $P(A) = 1/3$, $P(B) = 1/4$,
 $P(A/B) = 1/6$, then $P(B/A) =$

- 1. $1/4$
- 2. $3/4$
- 3. $1/8$
- 4. $1/2$

Options :

- 89951436730. 1
- 89951436731. 2
- 89951436732. 3
- 89951436733. 4

Question Number : 10 Question Id : 8995149318 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

In Poisson probability distribution, if value of λ is integer then distribution will be

- 1.bimodal
- 2.unimodal
- 3.positive modal
- 4.negative modal

Options :

89951436734. 1
89951436735. 2
89951436736. 3
89951436737. 4

Question Number : 11 Question Id : 8995149319 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

If $A \subset B$, then $P(A/B)$ is equal to

- 1.zero
- 2.one
3. $P(A)/P(B)$
4. $P(B)/P(A)$

Options :

89951436738. 1
89951436739. 2
89951436740. 3
89951436741. 4

Question Number : 12 Question Id : 8995149320 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

If $P(A/B) = 1/4$ and $P(B/A) = 1/3$, then $\frac{P(A)}{P(B)}$ is

- 1. $3/4$
- 2. $7/12$
- 3. $1/4$
- 4. $1/12$

Options :

- 89951436742. 1
- 89951436743. 2
- 89951436744. 3
- 89951436745. 4

Question Number : 13 Question Id : 8995149321 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If $A \subset B$, then

- 1. $P(A/C)$ less than $P(B/C)$
- 2. $P(A/C)$ less than or equal to $P(B/C)$
- 3. $P(A/C)$ greater than $P(B/C)$
- 4. $P(A/C)$ greater than or equal to $P(B/C)$

Options :

- 89951436746. 1
- 89951436747. 2
- 89951436748. 3
- 89951436749. 4

Question Number : 14 Question Id : 8995149322 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

For any two events A and B, the probability $P(A/B) + P(A^c/B)$ is equal to

- 1. 0
- 2. 1
- 3. $1/2$
- 4. none of the above

Options :

- 89951436750. 1

89951436751. 2
89951436752. 3
89951436753. 4

Question Number : 15 Question Id : 8995149323 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

X be a continuous r.v. following exponential distribution with parameter 1

Then F(x) follows

- 1.Exponential (1)
- 2.Uniform (0,1)
- 3.Gamma (0,1)
- 4.Normal (0,1)

Options :

89951436754. 1
89951436755. 2
89951436756. 3
89951436757. 4

Question Number : 16 Question Id : 8995149324 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

If the events A and B are independent, then $P(B/A)$ is equal to

1. $P(A \cap B)$
2. $P(A)$
3. $P(B)$
- 4.none of the above

Options :

89951436758. 1
89951436759. 2
89951436760. 3
89951436761. 4

Question Number : 17 Question Id : 8995149325 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

Number of conditions for mutual independence of n events

1. $2^n - n - 1$

2. 2^n

3. n

4. $n - 1$

Options :

89951436762. 1

89951436763. 2

89951436764. 3

89951436765. 4

Question Number : 18 Question Id : 8995149326 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The probability of throwing an odd sum with two fair dice is

1. $1/4$

2. $1/16$

3. 1

4. $1/2$

Options :

89951436766. 1

89951436767. 2

89951436768. 3

89951436769. 4

Question Number : 19 Question Id : 8995149327 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

There are two unbiased coins and one biased coin with tail on both sides. A coin is chosen at random and tossed 3 times. If tail occurs all the 3 times, what is the probability that the biased coin has been chosen?

- 1.4/10
- 2.6/10
- 3.8/10
- 4.9/10

Options :

- 89951436770. 1
- 89951436771. 2
- 89951436772. 3
- 89951436773. 4

Question Number : 20 Question Id : 8995149328 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

A number is selected randomly from each of the two sets 1, 2, 3, 4, 5, 6, 7, 8 and 2, 3, 4, 5, 6, 7, 8, 9 . The probability that the sum of the numbers is equal to 9 is

- 1.8/91
- 2.7/72
- 3.14/81
- 4.7/64

Options :

- 89951436774. 1
- 89951436775. 2
- 89951436776. 3
- 89951436777. 4

Question Number : 21 Question Id : 8995149329 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

A random variable X with possible values 1, 2, 3, 4 and 5 having $F(4.2) = 0.90$.

$P(X = 5)$ is

1.0.8

2.0.9

3.0.1

4.0.5

Options :

89951436778. 1

89951436779. 2

89951436780. 3

89951436781. 4

Question Number : 22 Question Id : 8995149330 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The probability of getting at least one 6 when two unbiased dice are thrown
is

1.6/36

2.1/36

3.11/36

4.21/36

Options :

89951436782. 1

89951436783. 2

89951436784. 3

89951436785. 4

Question Number : 23 Question Id : 8995149331 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A problem in Statistics is given to three students A, B, and C where chance of solving it are $1/2$, $3/4$ and $1/4$ respectively. Then the probability that the problem will be solved is

- 1. $3/32$
- 2. $3/4$
- 3. $29/32$
- 4. $9/32$

Options :

- 89951436786. 1
- 89951436787. 2
- 89951436788. 3
- 89951436789. 4

Question Number : 24 Question Id : 8995149332 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

The outcomes of tossing a coin three time are a variable of the type

- 1. continuous r.v
- 2. discrete r.v
- 3. neither discrete nor continuous
- 4. discrete as well as continuous

Options :

- 89951436790. 1
- 89951436791. 2
- 89951436792. 3
- 89951436793. 4

Question Number : 25 Question Id : 8995149333 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

A discrete r.v has probability mass function $P(X)=kq^x p$, $p + q = 1, x = 2, 3, 4, \dots$. The value of k should be equal to

- 1. $1/q^2$
- 2. $1/p$
- 3. $1/q$
- 4. $1/pq$

Options :

- 89951436794. 1
- 89951436795. 2
- 89951436796. 3
- 89951436797. 4

Question Number : 26 Question Id : 8995149334 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The measure of location which is the most likely to be influenced by extreme values in the data set is the

- 1.range
- 2.median
- 3.mode
- 4.arithmetic mean

Options :

- 89951436798. 1
- 89951436799. 2
- 89951436800. 3
- 89951436801. 4

Question Number : 27 Question Id : 8995149335 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Let a r.v. X has mean 4 and standard deviation 5. Then the variance of the variable $Y = 3X + 6$ is

- 1.81
- 2.225
- 3.21
- 4.231

Options :

- 89951436802. 1
- 89951436803. 2
- 89951436804. 3
- 89951436805. 4

Question Number : 28 Question Id : 8995149336 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

Let X be a continuous r.v with pdf

$$f(x) = \begin{cases} kx, & 0 \leq x \leq 1 \\ k, & 1 \leq x \leq 2 \\ 0, & \text{otherwise.} \end{cases}$$
 The value

of k is equal to

1.1/4

2.2/3

3.2/5

4.3/4

Options :

89951436806. 1

89951436807. 2

89951436808. 3

89951436809. 4

Question Number : 29 Question Id : 8995149337 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

The weight of person in a country is a r.v. of the type

1.discrete

2.continuous

3.neither 1 nor 2

4.both 1 and 2

Options :

89951436810. 1

89951436811. 2

89951436812. 3

89951436813. 4

Question Number : 30 Question Id : 8995149338 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

If X is a r.v with distribution function $F(x)$, then $P(X^2 \leq y)$ is

1. $P(-\sqrt{y} \leq X \leq \sqrt{y})$
2. $P(X \leq \sqrt{y}) - P(X \leq -\sqrt{y})$
3. $F(\sqrt{y}) - F(-\sqrt{y})$
4. all the above

Options :

89951436814. 1
89951436815. 2
89951436816. 3
89951436817. 4

Question Number : 31 Question Id : 8995149339 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

For a random variable X , $E[X(X - 1)] - E(X)[E(X) - 1]$ is,

1. $E(X^2)$
2. $E(X^3)$
3. $V(X)$
4. $V(X) - E(X)$

Options :

89951436818. 1
89951436819. 2
89951436820. 3
89951436821. 4

Question Number : 32 Question Id : 8995149340 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The correct relationship between A.M, G.M and H.M is

1. $A.M = G.M = H.M$
2. $G.M \geq A.M \geq H.M$
3. $H.M \geq G.M \geq A.M$
4. $A.M \geq G.M \geq H.M$

Options :

89951436822. 1

89951436823. 2

89951436824. 3

89951436825. 4

Question Number : 33 Question Id : 8995149341 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

A distribution is mesokurtic and has fourth central moment 27. Then variance

is

1.9

2.3

3.-3

4.-9

Options :

89951436826. 1

89951436827. 2

89951436828. 3

89951436829. 4

Question Number : 34 Question Id : 8995149342 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following is not a property of a binomial experiment?

1.the experiment consists of a sequence of n identical trials

2.each outcome can be referred to as a success or a failure

3.the probabilities of the two outcomes can change from one trial to the next

4. the trials are independent

Options :

89951436830. 1

89951436831. 2

89951436832. 3

89951436833. 4

Question Number : 35 Question Id : 8995149343 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

First two moments about the value 5 of a distribution are 2 and 20. The mean of X is,

- 1.2
- 2.7
- 3.10
- 4.16

Options :

- 89951436834. 1
- 89951436835. 2
- 89951436836. 3
- 89951436837. 4

Question Number : 36 Question Id : 8995149344 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

Sum of n independent geometric r.vs follows

- 1.Extended Geometric
- 2.Negative binomial
- 3.Binomial
- 4.Hypergeometric

Options :

- 89951436838. 1
- 89951436839. 2
- 89951436840. 3
- 89951436841. 4

Question Number : 37 Question Id : 8995149345 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

The probability of a woman lives to at least seventy years is 0.70 and is 0.55 that she will live to at least eighty years. If a woman is seventy years old, what is the conditional probability she will survive to eighty years?

- 1.55/70
- 2.70/55
- 3.15/70
- 4.15/55

Options :

- 89951436842. 1
- 89951436843. 2
- 89951436844. 3
- 89951436845. 4

Question Number : 38 Question Id : 8995149346 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

$P(X > Y) = 1$ implies that

- 1. $E(Y) < E(X)$
- 2. $E(Y) > E(X)$
- 3. $E(Y) \geq E(X)$
- 4. $E(Y) = E(X)$

Options :

- 89951436846. 1
- 89951436847. 2
- 89951436848. 3
- 89951436849. 4

Question Number : 39 Question Id : 8995149347 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If X is a r.v, $E(e^{itX})$ is known as

- 1.characteristic function
- 2.moment generating function
- 3.probability generating function
- 4.all the above

Options :

- 89951436850. 1
- 89951436851. 2
- 89951436852. 3
- 89951436853. 4

Question Number : 40 Question Id : 8995149348 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Cumulant generating function is

- 1. $\log_e \varphi_X(t)$
- 2. $\log_e M_X(t)$
- 3. $\log_e M_{aX+b}(t)$
- 4. $\log_e \varphi_{aX+b}(t)$

Options :

- 89951436854. 1
- 89951436855. 2
- 89951436856. 3
- 89951436857. 4

Question Number : 41 Question Id : 8995149349 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Suppose φ is a characteristic function. Then

- 1. $\varphi(0) = 1$
- 2. $\varphi(0) < 1$
- 3. $\varphi(0) > 1$
- 4. $0 < \varphi(0) < 1$

Options :

- 89951436858. 1
- 89951436859. 2
- 89951436860. 3
- 89951436861. 4

Question Number : 42 Question Id : 8995149350 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

The moment generating function of a $U(2,5)$ r.v. is

1. $\frac{e^{2t} - e^{5t}}{3t}, t \neq 0$
2. $\frac{e^{5t} - e^{2t}}{3t}, t \neq 0$
3. $\frac{e^{2t} - e^{5t}}{3t}$
4. $\frac{e^{5t} - e^{2t}}{3t}$

Options :

89951436862. 1
89951436863. 2
89951436864. 3
89951436865. 4

Question Number : 43 Question Id : 8995149351 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

25% of the girls and 10% of the boys in a college are studying literature. 60% of the students of the college are boys. What is the probability that a student found studying literature is a boy?

1. 4/9
2. 3/8
3. 5/8
4. 2/9

Options :

89951436866. 1
89951436867. 2
89951436868. 3
89951436869. 4

Question Number : 44 Question Id : 8995149352 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

When an unbiased die is thrown, showing up the sides 4 or 6 is considered as a success. In repetition of the experiment, find the expectation of the number of failures before the 5th success.

- 1.2
- 2.5
- 3.10
- 4.30

Options :

- 89951436870. 1
- 89951436871. 2
- 89951436872. 3
- 89951436873. 4

Question Number : 45 Question Id : 8995149353 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

If X is a continuous r.v being the pdf $f(x) = \begin{cases} \frac{1}{3}, -1 \leq x \leq 0 \\ \frac{2}{3}, 0 \leq x \leq 1 \end{cases}$

Then $E(X^2)$ is equal to

- 1.1/9
- 2.2/3
- 3.5/12
- 4.1/3

Options :

- 89951436874. 1
- 89951436875. 2
- 89951436876. 3
- 89951436877. 4

Question Number : 46 Question Id : 8995149354 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

An urn contains 4 tickets marked with numbers 112, 121, 211, 222 and one ticket is drawn at random. Let A_i ($i=1, 2, 3$) be the event that i^{th} digit of the number of the ticket drawn is 1. The events A_1 , A_2 and A_3 are -----

1. Mutually exclusive
2. Dependent
3. Independent
4. Pair wise Independent

Options :

89951436878. 1
89951436879. 2
89951436880. 3
89951436881. 4

Question Number : 47 Question Id : 8995149355 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Suppose $f(x) = \frac{1}{2a}, -a \leq x \leq a$. Then μ_2

1. $\frac{a^2}{3}$

2. $\frac{a^2}{4}$

3. $a/3$

4. $a/4$

Options :

89951436882. 1
89951436883. 2
89951436884. 3
89951436885. 4

Question Number : 48 Question Id : 8995149356 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

$V(aX + b)$ equals

1. $aV(X)$
2. $a^2V(X)$
3. $V(X)$
4. none of the above

Options :

89951436886. 1
89951436887. 2
89951436888. 3
89951436889. 4

Question Number : 49 Question Id : 8995149357 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

If A and B are any two mutually exclusive events, then $P(A/A \cup B)$ is

1. $\frac{P(A)}{P(A) + P(B)}$
2. $\frac{P(A \cup B)}{P(A) + P(B)}$
3. $\frac{P(B)}{P(A \cup B)}$
4. $\frac{P(B)}{P(A \cap B)}$

Options :

89951436890. 1
89951436891. 2
89951436892. 3
89951436893. 4

Question Number : 50 Question Id : 8995149358 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

m.g.f. of a exponential random variable with parameter λ is ,

1. $\frac{\lambda}{\lambda-t}$
2. $\frac{\lambda}{\lambda+t}$
3. $\frac{\lambda-t}{\lambda}$
4. $\frac{\lambda+t}{\lambda}$

Options :

89951436894. 1
89951436895. 2
89951436896. 3
89951436897. 4

Question Number : 51 Question Id : 8995149359 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

The first moment about mean is

- 1.1
- 2.0
- 3.any value between one and infinity
- 4.-1

Options :

89951436898. 1
89951436899. 2
89951436900. 3
89951436901. 4

Question Number : 52 Question Id : 8995149360 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Suppose φ is a characteristic function. Then

1. $0 \leq \varphi(t) \leq 1$
2. $-1 \leq \varphi(t) \leq 1$
3. $-\infty \leq \varphi(t) \leq \infty$
4. none of the above

Options :

- 89951436902. 1
- 89951436903. 2
- 89951436904. 3
- 89951436905. 4

Question Number : 53 Question Id : 8995149361 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

The moment generating function of a normal random variable with mean 0 and variance 8 is,

- 1. e^{4t^2}
- 2. e^{2t^2}
- 3. e^{-2t^2}
- 4. e^{-4t^2}

Options :

- 89951436906. 1
- 89951436907. 2
- 89951436908. 3
- 89951436909. 4

Question Number : 54 Question Id : 8995149362 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

If X is uniformly distributed over $(-a, a)$, then the value of a so that $P(|x| < 1) = P(|x| > 1)$ is

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Options :

- 89951436910. 1
- 89951436911. 2
- 89951436912. 3
- 89951436913. 4

Question Number : 55 Question Id : 8995149363 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

Which of the following statements are true?

- 1.Moment generating function always exist
- 2.Probability generating function always exist
- 3.Characteristic function always exist
- 4.All the above

Options :

89951436914. 1
89951436915. 2
89951436916. 3
89951436917. 4

Question Number : 56 Question Id : 8995149364 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

The expected number of failures preceding the first success in a series of Bernoulian trials with constant probability p of success is

1. $p(1-p)$
2. $2p(1-p)$
3. $\frac{1-p}{p}$
4. np

Options :

89951436918. 1
89951436919. 2
89951436920. 3
89951436921. 4

Question Number : 57 Question Id : 8995149365 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

The variance of $3X - 5$ where X follow Poisson distribution with mean 2 is

- 1.6
- 2.18
- 3.13
- 4.23

Options :

- 89951436922. 1
- 89951436923. 2
- 89951436924. 3
- 89951436925. 4

Question Number : 58 Question Id : 8995149366 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Joint distribution function of (x, y) is equivalent to probability

- 1. $P(X = x, Y = y)$
- 2. $P(X \leq x, Y \leq y)$
- 3. $P(X \leq x, Y = y)$
- 4. $P(X \geq x, Y \geq y)$

Options :

- 89951436926. 1
- 89951436927. 2
- 89951436928. 3
- 89951436929. 4

Question Number : 59 Question Id : 8995149367 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

For two r.v.s X and Y have the joint pdf $f(x, y) = \begin{cases} k(x^2 + y^2), & 0 \leq x \leq 2, 1 \leq y \leq 4 \\ 0, & \text{otherwise} \end{cases}$

Then the value of k is,

- 1. 1/50
- 2. 2/50
- 3. 1/100
- 4. 1/2

Options :

- 89951436930. 1
- 89951436931. 2
- 89951436932. 3
- 89951436933. 4

Question Number : 60 Question Id : 8995149368 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

If value of p is less than 0.5 then the binomial distribution is -----

- 1. skewed to right
- 2. skewed to left
- 3. skewed to infinity
- 4. skewed to integers

Options :

- 89951436934. 1
- 89951436935. 2
- 89951436936. 3
- 89951436937. 4

Question Number : 61 Question Id : 8995149369 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Life of a machine follows normal distribution with mean 700 days and standard deviation 140 days. Probability that the machine will have a life time greater than 700 days is

- 1. 0.25
- 2. 0.50
- 3. 0.75
- 4. 1

Options :

- 89951436938. 1
- 89951436939. 2
- 89951436940. 3
- 89951436941. 4

Question Number : 62 Question Id : 8995149370 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

If X and Y have the joint pdf $f(x, y) = x + y$, $0 < x, y < 1$. Then $P(0 < X < \frac{1}{2}, \frac{1}{2} < Y < 1)$

is

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

Options :

- 89951436942. 1
- 89951436943. 2
- 89951436944. 3
- 89951436945. 4

Question Number : 63 Question Id : 8995149371 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

$X \sim N(4, 9)$ and $Y \sim N(0, 4)$, X and Y are independent. Then $Z = X - 2Y$

Follows

- 1. $N(4, 2)$
- 2. $N(0, 2)$
- 3. $N(0, 5)$
- 4. $N(4, 25)$

Options :

- 89951436946. 1
- 89951436947. 2
- 89951436948. 3
- 89951436949. 4

Question Number : 64 Question Id : 8995149372 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

If X follow exponential distribution with parameter 5, $P(X > 5/X > 3) =$

- 1. $1 - e^{-5}$
- 2. $1 - e^{-10}$
- 3. e^{-5}
- 4. e^{-10}

Options :

- 89951436950. 1
- 89951436951. 2
- 89951436952. 3
- 89951436953. 4

Question Number : 65 Question Id : 8995149373 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

The joint pdf of two r.v.s X and Y is given by $f(x, y) = \begin{cases} 24x(1 - y), 0 < x < y < 1 \\ 0, otherwise \end{cases}$

Then the marginal pdf of X is

- 1. $12x^2(x-1)$
- 2. $12x(x-1)^2$
- 3. $12(x-1)^2$
- 4. $12x$

Options :

- 89951436954. 1
- 89951436955. 2
- 89951436956. 3
- 89951436957. 4

Question Number : 66 Question Id : 8995149374 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

Let the joint distribution of (X, Y) be
 $(x,y) : (1,1) (1,2) (2,1) (2,2) (3,1) (3,3)$
 $f(x,y) : 1/10 \ 1/5 \ 2/5 \ 3/20 \ 1/10 \ 1/10$
Then $P(X \leq 2 | Y \geq 2)$ is

- 1. $1/8$
- 2. $3/8$
- 3. $7/8$
- 4. $4/8$

Options :

- 89951436958. 1
- 89951436959. 2
- 89951436960. 3
- 89951436961. 4

Question Number : 67 Question Id : 8995149375 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

The $(1, 1)^{\text{th}}$ central moment μ_{11} of a bivariate probability distribution is called

- 1. $\text{Cov}(X, Y)$
- 2. $\text{var}(X)\text{var}(Y)$
- 3. $\text{Var}(XY)$
- 4. ρ_{xy}

Options :

- 89951436962. 1
- 89951436963. 2
- 89951436964. 3
- 89951436965. 4

Question Number : 68 Question Id : 8995149376 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

If X and Y are two independent r.v.s. then

1. $E(X, Y) = E(X)E(Y)$

2. $\text{cov}(X, Y) = 0$

3. $\rho_{xy} = 0$

4. all the above

Options :

89951436966. 1

89951436967. 2

89951436968. 3

89951436969. 4

Question Number : 69 Question Id : 8995149377 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

$E[E(Y/X = x)]$ is -----

1. $E(X)$

2. $E(Y)$

3. $V(X)$

4. $V(Y)$

Options :

89951436970. 1

89951436971. 2

89951436972. 3

89951436973. 4

Question Number : 70 Question Id : 8995149378 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

X and Y are jointly distributed with coefficient of correlation 0.40. $SD(X) = 3$; $SD(Y) = 4$.

$\text{Cov}(X, Y)$ is

1. 1.2

2. 2.8

3. 1.6

4. 4.8

Options :

- 89951436974. 1
- 89951436975. 2
- 89951436976. 3
- 89951436977. 4

Question Number : 71 Question Id : 8995149379 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Angle between the regression lines for the variables X and Y with $r_{xy} = 1$

is,

- 1.0°
- 2.90°
- 3.45°
- 4.none of the above

Options :

- 89951436978. 1
- 89951436979. 2
- 89951436980. 3
- 89951436981. 4

Question Number : 72 Question Id : 8995149380 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Let X and Y have the joint pdf $f(x, y) = \begin{cases} \frac{3}{4}x, & 0 < x < y < 2 \\ 0, & \text{otherwise} \end{cases}$

Then the conditional pdf of Y given X = x is

- 1. $\frac{3}{4}x(2 - x)$
- 2. $\frac{3}{8}y^2$
- 3. $\frac{1}{2-x}$
- 4. none of the above

Options :

- 89951436982. 1
- 89951436983. 2

89951436984. 3

89951436985. 4

Question Number : 73 Question Id : 8995149381 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

In a binomial distribution with parameters n and p , the relationship between mean and variance is

- 1.mean = variance
- 2.mean < variance
- 3.mean > variance
- 4.none of the above

Options :

89951436986. 1

89951436987. 2

89951436988. 3

89951436989. 4

Question Number : 74 Question Id : 8995149382 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

The mean and variance of binomial distribution as 16 and 8 respectively. Then $P(X = 1)$ is equal to

1. $\frac{1}{2^{32}}$
2. $\frac{1}{2^{16}}$
3. $\frac{1}{2^8}$
4. $\frac{1}{2^{27}}$

Options :

89951436990. 1

89951436991. 2

89951436992. 3

89951436993. 4

Question Number : 75 Question Id : 8995149383 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Given the joint pdf of X and Y, $f(x, y) = e^{-(x+y)}$, $x > 0$, $y > 0$, $E(XY)$ is

- 1.0
- 2.1
- 3.3/2
- 4.2

Options :

- 89951436994. 1
- 89951436995. 2
- 89951436996. 3
- 89951436997. 4

Question Number : 76 Question Id : 8995149384 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Binomial distribution with parameters n and p is said to be symmetric if

- 1. $q < p$
- 2. $q = p$
- 3. $q > p$
- 4. $q \neq p$

Options :

- 89951436998. 1
- 89951436999. 2
- 89951437000. 3
- 89951437001. 4

Question Number : 77 Question Id : 8995149385 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

For a binomial distribution coefficient of skewness β_1 is equal to

1. $\frac{q-p}{\sqrt{npq}}$
2. $\frac{q-p}{(npq)^2}$
3. $\frac{(q-p)^2}{npq}$
4. $\frac{q}{np}$

Options :

89951437002. 1
89951437003. 2
89951437004. 3
89951437005. 4

Question Number : 78 Question Id : 8995149386 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

If X and Y are independent Poisson variables such that $P(X = 1) = P(X = 2)$ and $P(Y = 2) = P(Y = 3)$, then the variance of $X - 2Y$ is

1. 9
2. 10
3. 12
4. 14

Options :

89951437006. 1
89951437007. 2
89951437008. 3
89951437009. 4

Question Number : 79 Question Id : 8995149387 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Mgf of a Poisson distribution is

1. $e^t(e^\lambda - 1)$

2. $e^{\lambda(e^t - 1)}$

3. $e^\lambda(e^t - 1)$

4. $e^t(e^\lambda - 1)$

Options :

89951437010. 1

89951437011. 2

89951437012. 3

89951437013. 4

Question Number : 80 Question Id : 8995149388 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

If X and Y are independent Poisson variables, then the conditional distribution of X given $X + Y$ follows

1. Poisson

2. Geometric

3. Binomial

4. Bernoulli

Options :

89951437014. 1

89951437015. 2

89951437016. 3

89951437017. 4

Question Number : 81 Question Id : 8995149389 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following is a particular case of negative binomial distribution?

1. Poisson distribution

2. Geometric distribution

3. Uniform distribution

4. Gamma distribution

Options :

- 89951437018. 1
- 89951437019. 2
- 89951437020. 3
- 89951437021. 4

Question Number : 82 Question Id : 8995149390 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

An appropriate relationship between Quartile Deviation(QD) and Standard Deviation(SD) of Normal distribution is

- 1.5 QD = 4 SD
- 2.4 QD = 5 SD
- 3.3 QD = 2 SD
- 4.2 QD = 3 SD

Options :

- 89951437022. 1
- 89951437023. 2
- 89951437024. 3
- 89951437025. 4

Question Number : 83 Question Id : 8995149391 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

The p.d.f. at the point of inflation of normal curve is

- 1. $\frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}}$
- 2. $\frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}}$
- 3. $\frac{1}{\sqrt{2\pi}}$
- 4. $\frac{1}{\sigma\sqrt{2\pi}}$

Options :

- 89951437026. 1
- 89951437027. 2
- 89951437028. 3

89951437029. 4

Question Number : 84 Question Id : 8995149392 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

The distribution function of X with rectangular distribution over the interval (a, b) is

1. $\frac{1}{b-a}$

2. $\frac{x-a}{b-a}$

3. $\frac{b-a}{x-a}$

4. $\frac{x-b}{b-a}$

Options :

89951437030. 1

89951437031. 2

89951437032. 3

89951437033. 4

Question Number : 85 Question Id : 8995149393 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

For an exponential distribution with pdf $f(x) = \frac{1}{3} e^{-\frac{x}{3}}, x \geq 0$, its mean and variance are

1. (1/3, 3)

2. (3, 1/9)

3. (1/3, 1/9)

4. (3, 9)

Options :

89951437034. 1

89951437035. 2

89951437036. 3

89951437037. 4

Question Number : 86 Question Id : 8995149394 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

If X is a continuous r.v with mean μ and variance σ^2 then for any positive number $P\{|X - \mu| \geq k\sigma\} \leq \frac{1}{k^2}$

is known as

- 1.Liapunov's inequality
- 2.Chebysheve's inequality
- 3.Khinchine's inequality
- 4.none of the above

Options :

89951437038. 1
89951437039. 2
89951437040. 3
89951437041. 4

Question Number : 87 Question Id : 8995149395 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

In Lindberg Levy form of central limit theorem, the r.v.s $X_1, X_2, \dots, X_n$ are assumed to be

- 1.independent
- 2.identical
- 3.with same mean and variance
- 4.all the above

Options :

89951437042. 1
89951437043. 2
89951437044. 3
89951437045. 4

Question Number : 88 Question Id : 8995149396 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

By Tchebycheff's inequality, the probability of the value of a random variable differ from its mean by more than twice the standard deviation is less than

1. $\frac{1}{4}$
2. $\frac{1}{2}$
3. $\frac{1}{\sqrt{2}}$
4. $\frac{1}{8}$

Options :

89951437046. 1
89951437047. 2
89951437048. 3
89951437049. 4

Question Number : 89 Question Id : 8995149397 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

If $X_n \xrightarrow{P} a$ as $n \rightarrow \infty$, then we have the result

1. for any $\epsilon > 0, P(\{|X_n - a| > \epsilon\}) \rightarrow 0$ as $n \rightarrow \infty$
2. for any $\epsilon > 0, P(\{|X_n - a| < \epsilon\}) \rightarrow 0$ as $n \rightarrow \infty$
3. Both 1 and 2
4. neither 1 nor 2

Options :

89951437050. 1
89951437051. 2
89951437052. 3
89951437053. 4

Question Number : 90 Question Id : 8995149398 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following are not true

- 1.almost sure convergence implies convergence in law
- 2.convergence in probability implies convergence in r^{th} mean
- 3.almost sure convergence implies convergence in probability
- 4.convergence in law to a degenerate random variable implies convergence in probability.

Options :

89951437054. 1

89951437055. 2

89951437056. 3

89951437057. 4

Question Number : 91 Question Id : 8995149399 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

By central limit theorem, the mean of large samples taken from $U[0, \theta]$ follows

1. $N(\theta, \frac{\theta}{\sqrt{12n}})$

2. $N(\frac{\theta}{4}, \frac{\theta}{\sqrt{12n}})$

3. $N(\frac{\theta}{2}, \frac{\theta}{\sqrt{12n}})$

4. $N(2\theta, \frac{\theta}{\sqrt{12n}})$

Options :

89951437058. 1

89951437059. 2

89951437060. 3

89951437061. 4

Question Number : 92 Question Id : 8995149400 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A r.v X has mean 50 and variance 100. Then by chebyshev's inequality the appropriate bound for $P\{|X - 50| > 15\}$ is

- 1.9/4
- 2.4/9
- 3.2/3
- 4.3/2

Options :

- 89951437062. 1
- 89951437063. 2
- 89951437064. 3
- 89951437065. 4

Question Number : 93 Question Id : 8995149401 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

The period of an ergodic chain is

- 1.1
- 2.2
- 3.3
- 4.none

Options :

- 89951437066. 1
- 89951437067. 2
- 89951437068. 3
- 89951437069. 4

Question Number : 94 Question Id : 8995149402 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

If b_{yx} and b_{xy} are two regression coefficients, then they have

- 1.same sign
- 2.opposite sign
- 3.either same or opposite signs
- 4.nothing can be said

Options :

- 89951437070. 1
- 89951437071. 2
- 89951437072. 3
- 89951437073. 4

Question Number : 95 Question Id : 8995149403 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

If there are two variables X and Y there can be atmostregression lines

- 1.2
- 2.1
- 3.3
- 4.none of the above

Options :

- 89951437074. 1
- 89951437075. 2
- 89951437076. 3
- 89951437077. 4

Question Number : 96 Question Id : 8995149404 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

If $r = 0$, the angle between two lines of regression is

- 1. 90°
- 2. 0°
- 3. 60°
- 4. 30°

Options :

- 89951437078. 1
- 89951437079. 2
- 89951437080. 3
- 89951437081. 4

Question Number : 97 Question Id : 8995149405 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

Given the two regression lines $3x-4y+8=0$ and $4x-3y=1$. The means of X and Y are

1. $\bar{x} = 4, \bar{y} = 5$

2. $\bar{x} = 3, \bar{y} = 4$

3. $\bar{x} = 4/3, \bar{y} = 5/4$

4. none of the above

Options :

89951437082. 1

89951437083. 2

89951437084. 3

89951437085. 4

Question Number : 98 Question Id : 8995149406 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

In matrix notation, the Chapman-Kolmogorov equation can be written as

1. $P^{m+n} = P^m + P^n$

2. $P^{m+n} = P^m P^n$

3. $P^{m+n} = P^m$

4. $P^{m+n} = P^n$

Options :

89951437086. 1

89951437087. 2

89951437088. 3

89951437089. 4

Question Number : 99 Question Id : 8995149407 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

State j is accessible from state i if there exist $n \in N$ such that

1. $P_{ij}^{(n)} > 0$

2. $P_{ji}^{(n)} > 0$

3. $P_{ij}^{(n)} \geq 0$

4. $P_{ji}^{(n)} \geq 0$

Options :

89951437090. 1

89951437091. 2

89951437092. 3

89951437093. 4

Question Number : 100 Question Id : 8995149408 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The period of a state i is defined as

1. $d(i) = \gcd \{n | p_{ii}^n < 0\}$

2. $d(i) = \gcd \{n | p_{ii}^n > 0\}$

3. $d(i) = \gcd \{n | p_{ii}^n \geq 0\}$

4. none of the above

Options :

89951437094. 1

89951437095. 2

89951437096. 3

89951437097. 4