CUET PG 2025 STATISTICS Question Paper

Time Allowed :1 Hour 30 Mins	**Maximum Marks :**300	**Total Questions :**75

General Instructions

Read the following instructions very carefully and strictly follow them:

1. The examination duration is 90 minutes. Manage your time effectively to attempt all questions within this period.
2. The total marks for this examination are 300. Aim to maximize your score by strategically answering each question.
3. There are 75 mandatory questions to be attempted in the Agro forestry paper. Ensure that all questions are answered.
4. Questions may appear in a shuffled order. Do not assume a fixed sequence and focus on each question as you proceed.
5. The marking of answers will be displayed as you answer. Use this feature to monitor your performance and adjust your strategy as needed.
6. You may mark questions for review and edit your answers later. Make sure to allocate time for reviewing marked questions before final submission.
7. Be aware of the detailed section and sub-section guidelines provided in the exam. Understanding these will aid in effectively navigating the exam.

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1. The sequence $\{a_n = \frac{1}{n^2}; n > 0\}$ is

(A) convergent
(B) divergent
(C) oscillates finitely
(D) oscillates infinitely

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2. The solution of the differential equation,

$(x^2+1)\frac{dy}{dx} + 2xy = \sqrt{x^2+4}$, is

(A) $y = (x^2+1)^{-1}\left(\frac{1}{2}x\sqrt{x^2+4} + 2\log(x+\sqrt{x^2+4})\right) + c$; where c is a constant
(B) $y = (x^2+1)^{-\frac{1}{2}}\left(\frac{1}{2}x\sqrt{x^2+4} + 2\log(x+\sqrt{x^2+4})\right) + c$; where c is a constant
(C) $y = \frac{1}{2}\left(\frac{1}{2}x\sqrt{x^2+4} + 2\log|x+\sqrt{x^2+4}|\right) + c$; where c is a constant

(D) $y = \left(x\sqrt{x^2+4} + 2\log(x+\sqrt{x^2+4})\right) + c$; where c is a constant

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3. The maximum values of the function

$\sin(x) + \cos(2x)$, are

(A) $(0, -2)$
(B) $(0, \frac{9}{8})$
(C) $(\frac{3}{8}, \frac{9}{8})$
(D) $(\frac{9}{8}, \frac{9}{8})$

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4. If, $y = x^{\tan(x)}$, then $\frac{dy}{dx}$ at $x = \frac{\pi}{4}$, is

(A) $\frac{\pi}{4}$
(B) $\frac{\pi}{4}\log(\frac{\pi}{4})$
(C) $\frac{\pi}{4}(\log(\frac{\pi}{4}))^2 + 1$
(D) $\frac{\pi}{4}\log(\frac{\pi}{4}) + 2\log(\frac{\pi}{4})$
(E) None of the above.

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5. If $f(x)$ and $g(x)$ are differentiable functions for $0 \leq x \leq 1$ such that, $f(1) - f(0) = k(g(1) - g(0))$, $k \neq 0$, and there exists a 'c' satisfying $0 < c < 1$. Then, the value of $\frac{f'(c)}{g'(c)}$ is equal to

(A) $2k$
(B) k
(C) $-k$
(D) $\frac{1}{k}$

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6. A is a, $n \times n$ matrix of real numbers and $A^3 - 3A^2 + 4A - 6I = 0$, where I is a, $n \times n$ unit matrix. If A^{-1} exists, then

(A) $A^{-1} = A - I$
(B) $A^{-1} = A + 6I$
(C) $A^{-1} = 3A - 6I$
(D) $A^{-1} = \frac{1}{6}(A^2 - 3A + 4I)$

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7. Let P and Q be two square matrices such that PQ = I, where I is an identity matrix. Then zero is an eigen value of

(A) P but not Q
(B) Q but not P
(C) Both P and Q
(D) Neither P nor Q

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8. The system of equations given by $\begin{bmatrix} 1 & 1 & 1 & : & 3 \\ 0 & -2 & -2 & : & 4 \\ 1 & -5 & 0 & : & 5 \end{bmatrix}$ has the solution:

(A) $x = 1, y = 4, z = 0$
(B) $x = 3, y = 4, z = 5$
(C) $x = 5, y = 0, z = -2$
(D) $x = 1, y = 4, z = -1$

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9. If $f'(x) = 3x^2 - \frac{2}{x^2}$, $f(1) = 0$ then, $f(x)$ is

(A) $x^3 + \frac{2}{x^2} - 3$
(B) $x^3 + \frac{1}{x^2} + 3$
(C) $x^3 + \frac{2}{x} - 3$
(D) $x^3 + \frac{2}{x^2} + 3$

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10. The values of 'm' for which the infinite series,

$\sum \frac{\sqrt{n+1}+\sqrt{n}}{n^m}$ converges, are:

(A) $m > \frac{1}{3}$
(B) $m > \frac{1}{2}$
(C) $m > 1$
(D) $m > \frac{3}{2}$

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11. The value of $\lim_{x\to 1} \frac{x^3-1}{x-1}$ is

(A) ∞
(B) 0
(C) 1

(D) 3

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12. Which of the following statement is true about the geometric series $1 + r + r^2 + r^3 + \ldots\ldots\ldots\ldots; (r > 0)$?

(A) It diverges, if $0 < r < 1$ and converges, if $r \geq 1$
(B) It converges, if $0 < r < 1$ and diverges, if $r \geq 1$
(C) It is always convergent
(D) It is always divergent

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13. For Lagrange's mean value theorem, the value of 'c' for the function $f(x) = px^2+qx+r, p \neq 0$ in the interval $[1, b]$ and $c \in]1, b[$, is:

(A) $b/2$
(B) $b/2 + 1$
(C) $(b + 1)/4$
(D) $(b + 1)/2$

---

14. Consider a 2x2 matrix $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$. If $a + d = 1$ and $ad - bc = 1$, then A^3 is equal to

(A) 0
(B) $-I$
(C) $3I$
(D) I

---

15. The value of $\lim_{h\to 0} \left(\frac{1}{h} \int_4^{4+h} e^{t^2} dt \right)$ is

(A) e^{16}
(B) e^4
(C) e^{64}
(D) e^8

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16. The volume of the solid for the region enclosed by the curves $X = \sqrt{Y}$, $X = \frac{Y}{4}$ revolve about x-axis, is

(A) $\frac{2048\pi}{15}$ cubic units
(B) $\frac{1024\pi}{15}$ cubic units
(C) $\frac{4\pi}{15}$ cubic units
(D) $\frac{512\pi}{15}$ cubic units

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17. The area of the surface generated by revolving the curve $X = \sqrt{9 - Y^2}, -2 \leq Y \leq 2$ about the y-axis, is

(A) 24π Sq. units
(B) 12π Sq. units
(C) 16π Sq. units
(D) 48π Sq. units

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18. The limit of the sequence,

$\{b_n; b_n = \frac{n^n}{(n+1)(n+2)...(n+n)}; n > 0\}$, is

(A) $\frac{e}{2}$
(B) $\frac{e}{4}$
(C) e
(D) $\frac{1}{e}$

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19. Function, $f(x) = -|x-1| + 5, \forall x \in R$ attains maximum value at x =

(A) 1
(B) 5
(C) 2
(D) 9

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20. It is given that at x = 1, the function $f(x) = x^4 - 62x^2 + ax + 9$, attains its maximum value in the interval $[0, 2]$. Then, the value of 'a' is

(A) 12
(B) 120
(C) 100
(D) 20

21. A cyclist covers first five kilometers at an average speed of 10 k.m. per hour, another three kilometers at 8 k.m. per hour and the last two kilometers at 5 k.m. per hour. Then, the average speed of the cyclist during the whole journey, is

(A) 6.51 km/hr
(B) 8.40 km/hr
(C) 7.84 km/hr
(D) 7.05 km/hr

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22. A card is drawn at random from a standard deck of 52 cards. Then, the probability of getting either an ace or a club is:

(A) 17/52
(B) 16/52
(C) 1/4
(D) 1/12

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23. A six-faced die is rolled twice. Then the probability that an even number turns up at the first throw, given that the sum of the throws is 8, is

(A) 5/36
(B) 3/36
(C) 3/5
(D) 2/5

---

24. If the mean and variance of 5 values are both 4 and three out of 5 values are 1, 7 and 3, then the remaining two values are:

(A) 4 and 5
(B) 3 and 6
(C) 1 and 8
(D) 2 and 7

---

25. Let, random variable $X \sim \text{Bernoulli}(p)$. Then, β_1 is

(A) $\frac{(1-2p)}{p(1-p)}$
(B) $\frac{(1-2p)^2}{p(1-p)}$
(C) $\frac{p(1-p)}{(1-2p)}$
(D) $\frac{p^2(1-p)}{(1-2p)}$

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26. Out of 800 families with 4 children each, the percentage of families having no girls is:

(A) 5.25
(B) 6.25
(C) 8
(D) 12

---

27. Three urns contain 3 green and 2 white balls, 5 green and 6 white balls and 2 green and 4 white balls respectively. One ball is drawn at random from each of the urn. Then, the expected number of white balls drawn, is

(A) $\frac{2}{55}$
(B) $\frac{6}{330}$
(C) $\frac{3}{330}$
(D) 1

---

28. Let X_1, X_2, X_3 be three variables with means 3, 4 and 5 respectively, variances 10, 20 and 30 respectively and $cov(X_1, X_2) = cov(X_2, X_3) = 0$ and $cov(X_1, X_3) = 5$. If, $Y = 2X_1+3X_2+4X_3$ then, $\text{Var}(Y)$ is:

(A) 700
(B) 710
(C) 690
(D) 620

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29. If, joint distribution function of two random variables X and Y is given by $F_{X,Y}(x, y) = \begin{cases} 1 - e^{-x} - e^{-y} + e^{-(x+y)} & ; x > 0; y > 0 \\ 0 & ; \text{otherwise} \end{cases}$, then $\text{Var}(X)$ is

(A) 1
(B) 2
(C) 0

(D) $\frac{1}{2}$

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30. In a survey of 200 boys, 75 were intelligent and out of these intelligent boys, 40 had an education from the government schools. Out of not intelligent boys, 85 had an education form the private schools. Then, the value of the test statistic, to test the hypothesis that there is no association between the education from the schools and intelligence of boys, is:

(A) 7.80
(B) 6.28
(C) 4.80
(D) 8.89

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31. Minimum value of the correlation coefficient 'r' in a sample of 27 pairs from a bivariate normal population, significant at 5% level, is: (Given $t_{0.05}(25) = 2.06$)

(A) r > 0.25
(B) r > 0.30
(C) r > 0.381
(D) r > 0.19

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32. A man buys 60 electric bulbs from a company "P" and 70 bulbs from another company, "H". He finds that the average life of P's bulbs is 1500 hours with a standard deviation of 60 hours and the average life of H's bulbs is 1550 hours with a standard deviation of 70 hours. Then, the value of the test statistic to test that there is no significant difference between the mean lives of bulbs from the two companies, is:

(A) 2.85
(B) 4.38
(C) 5.27
(D) 3.90

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33. Mean height of plants obtained from a random sample of size 100 is 64 inches. The population standard deviation of the plants is 3 inches. If the plant heights are distributed normally, then the 99% confidence limits of the mean population height of plants, are:

(A) (63.2, 64.8)
(B) (62, 64.8)
(C) (63.2, 65)

(D) (62.2, 65.8)

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34. In a hypothetical group, it is given that $d = 0.05$, $p = 0.5\alpha$ and $t = 2$. If N is large, then the sample size n_0, is

(A) 250
(B) 325
(C) 400
(D) 550

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35. A sample of size 1600 is taken from a population of fathers and sons and the correlation between their heights is found to be 0.80. Then, the correlation limits for the entire population are:

(A) (0.573, 0.750)
(B) (0.773, 0.827)
(C) (0.8, 0.878)
(D) (0.573, 0.80)

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36. If $X_1, X_2, \ldots, X_n$ is a random sample from the population $f(x, \theta) = (\theta + 1)x^{\theta}; 0 < x < 1; \theta > -1$ and $Y = -\sum_{i=1}^{n} \log(x_i)$. Then $E\left(\frac{1}{Y}\right)$ is

(A) $\frac{\theta+1}{n}$
(B) $\frac{\theta+1}{n-1}$
(C) $\frac{\theta}{n}$
(D) $\frac{\theta}{n-1}$

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37. In a binomial distribution consisting of five independent trails, the probability of 1 and 2 success are 0.4096 and 0.2048 respectively. Then, the parameter 'p' of distribution is

(A) $\frac{1}{9}$
(B) $\frac{1}{7}$
(C) $\frac{1}{5}$
(D) $\frac{1}{2}$

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38. Let, $X \sim \beta_1(u, v)$ and $Y \sim \gamma(1, u+v)$; $(u, v > 0)$ be independent random variables. If, $Z = XY$, then the moment generating function of Z is given by

(A) $\left(1 - \frac{t}{v}\right)^{-u}$
(B) $(1-t)^{-v}$
(C) $(1-t)^{-u}$
(D) $\left(1 - \frac{t}{u}\right)^{-v}$

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39. If X and Y are independent and identically distributed geometric variables with parameter p, then the moment generating function of (X+Y) is given by

(A) $\left(\frac{p}{1-qe^t}\right)^2$
(B) $\frac{p}{(1-qe^t)^2}$
(C) $\left(\frac{1}{1-qe^t}\right)^2$
(D) $\frac{p}{(1-qe^t)}$

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40. Moment generating function of a random variable Y, is $\frac{1}{3}e^t(e^t - \frac{2}{3})$, then E(Y) is given by

(A) $\frac{1}{3}$
(B) $\frac{2}{3}$
(C) 2
(D) $\frac{3}{2}$

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41. A random variable X has a distribution with density function
$f(x;\beta) = \begin{cases} (\beta+1)x^{\beta}; & 0 < x < 1; \beta > -1 \\ 0; & \text{otherwise} \end{cases}$ Based on 'n' observations on X, Maximum Likelihood Estimator (MLE) of β is

(A) $\frac{-1}{\sum_{i=1}^{n} \log(x_i)}$
(B) $\frac{-n}{\sum_{i=1}^{n} \log(x_i)} - 1$
(C) $\sum_{i=1}^{n} \log(x_i) - 1$
(D) $\frac{-1}{\sum_{i=1}^{n} \log(x_i)} - 1$

---

42. Let, X and Y be independent and identically distributed Poisson(1) variables. If, Z = min(X, Y) then, P(Z = 1) is:

(A) $\frac{e-3}{e^2}$
(B) $\frac{2e-3}{e^2}$
(C) $\frac{2e-3}{2e^2}$
(D) $\frac{1-2e}{e^2}$

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43. In a simple random sample of 600 people taken from a city A, 400 smoke. In another sample of 900 people taken from a city B, 450 smoke. Then, the value of the test statistic to test the difference between the proportions of smokers in the two samples, is:

(A) 5.72
(B) 6.42
(C) 5.92
(D) 6.05

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44. If, $X \sim \text{Bin}(8, 1/2)$ and $Y = X^2 + 2$, then $P(Y \leq 6)$ is:

(A) 0.036
(B) 0.185
(C) 0.08
(D) 0.165

---

45. If, $f(X) = \frac{C\theta^x}{x}$; $x = 1, 2, \ldots$; $0 < \theta < 1$, then E(X) is equal to

(A) $C\theta$
(B) $\frac{C\theta}{(1-\theta)}$
(C) $\frac{C}{(1-\theta)}$
(D) C

---

46. If, $f(x; \alpha, \beta) = \begin{cases} \alpha\beta x^{\beta-1} e^{-\alpha x^\beta} & ; x > 0 \text{ and } \alpha, \beta > 0 \\ 0 & ; \text{otherwise} \end{cases}$, then the probability density function of $Y = x^\beta$ is

(A) $\begin{cases} \alpha\beta e^{-\alpha\beta y} & ; y > 0 \\ 0 & ; \text{otherwise} \end{cases}$

(B) $\begin{cases} \alpha e^{-\alpha y} & ; y > 0 \\ 0 & ; \text{otherwise} \end{cases}$

(C) $\begin{cases} \beta e^{-\beta y} & ; y > 0 \\ 0 & ; \text{otherwise} \end{cases}$

(D) $\begin{cases} \frac{1}{\beta} e^{-y/\beta} & ; y > 0 \\ 0 & ; \text{otherwise} \end{cases}$

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47. If $f(X) = \frac{1}{\sqrt{2\pi}} e^{-\frac{x^2}{2}}; -\infty < x < \infty$ and $Y = |X|$, then E(Y) is

(A) $\frac{1}{\sqrt{\pi}}$

(B) $\sqrt{\frac{2}{\pi}}$

(C) $\sqrt{2}$

(D) $\frac{2}{\sqrt{\pi}}$

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48. Let $\hat{\lambda}$ be the Maximum Likelihood Estimator of the parameter λ, then, on the basis of a sample of size 'n' from a population having the probability density function $f(x; \lambda) = \frac{e^{-\lambda}\lambda^x}{x!}$; $x = 0, 1, 2, \ldots$, $\lambda > 0$, the Var($\hat{\lambda}$) is

(A) λ

(B) $\frac{\lambda}{n^2}$

(C) $\frac{1}{\lambda}$

(D) $\frac{\lambda}{n}$

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49. Consider the probability density function $f(x; \theta) = \begin{cases} \frac{2x}{5\theta} & ; 0 \leq x \leq \theta \\ \frac{2(5-x)}{5(5-\theta)} & ; \theta \leq x \leq 5 \end{cases}$ For a sample of size 3, let the observations are, $x_1 = 1, x_2 = 4, x_3 = 2$. Then, the value of likelihood function at $\theta = 2$ is

(A) $\frac{4}{125}$

(B) $\frac{1}{125}$

(C) $\frac{8}{125}$

(D) $\frac{4}{375}$

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50. Let X_1, X_2, X_3, X_4 be a sample of size 4 from a U(0,θ) distribution. Suppose that, in order to test the hypothesis $H_0 : \theta = 1$ against the alternate $H_1 : \theta \neq 1$, an UMPCR is given by, $W_0 = \{x_{(4)} : x_{(4)} < \frac{1}{2} \text{ or } x_{(4)} > 1\}$, then the size α of W_0 is

(A) $\frac{1}{12}$
(B) $\frac{1}{16}$
(C) $\frac{1}{4}$
(D) $\frac{1}{3}$

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51. If, $1 \leq x \leq 1.5$ is the critical region for testing the null hypothesis $H_0 : \theta = 1$ against the alternative hypothesis $H_1 : \theta = 2$ on the basis of a single observation from the population, $f(x;\theta) = \begin{cases} \frac{1}{\theta} & ; 0 \leq x \leq \theta \\ 0 & ; \text{otherwise} \end{cases}$, then the power of the test, is

(A) $\frac{3}{4}$
(B) $\frac{1}{2}$
(C) $\frac{4}{5}$
(D) $\frac{1}{4}$

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52. Let p be the probability that a coin will fall heads in a single toss in order to test $H_0 : p = \frac{1}{2}$ against the alternate $H_1 : p = \frac{3}{4}$. The coin is tossed five times and H_0 is rejected if 3 or more than 3 heads are obtained. Then, the probability of Type I error, is

(A) $\frac{1}{2}$
(B) $\frac{1}{16}$
(C) $\frac{81}{128}$
(D) $\frac{1}{4}$

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53. If, $x \geq 1$ is the critical region for testing $H_0 : \theta = 2$ against the alternate $H_1 : \theta = 1$. On the basis of a single observation from the population $f(x;\theta) = \theta e^{-x\theta}; x > 0, \theta > 0$, then the size of Type II error is:

(A) $\frac{1}{e}$
(B) $\frac{1}{e^2}$
(C) $\frac{e-1}{e}$
(D) $1 - \frac{1}{e^2}$

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54. If $X \sim \beta_1(\alpha, \beta)$ such that parameters α, β are unknown, then the sufficient statistic for (α, β) is

(A) $T = (\sum x_i, \sum(1 - x_i))$
(B) $T = (\prod x_i, \sum(1 - x_i))$

(C) $T = (\sum x_i, \prod(1 - x_i))$
(D) $T = (\prod x_i, \prod(1 - x_i))$

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55. Let X have a probability density function of the form, $f(x;\theta) = \begin{cases} \frac{1}{\theta}e^{-x/\theta} & ;0 < x < \infty, \theta > 0 \\ 0 & ;\text{otherwise} \end{cases}$
To test null hypothesis $H_0 : \theta = 2$ against the alternate hypothesis $H_1 : \theta = 1$, a random sample of size 2 is taken. For the critical region $W_0 = \{(x_1, x_2) : 6.5 \leq x_1 + x_2\}$, the power of the test is

(A) $P(\chi^2_{(4)} \leq 6.5)$
(B) $P(\chi^2_{(4)} \geq 6.5)$
(C) $P(\chi^2_{(4)} \geq 13)$
(D) $P(\chi^2_{(4)} \geq 2)$

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56. If, $X \sim N(\theta, 1)$ and in order to test $H_0 : \theta = 1$ against the alternate $H_1 : \theta = 2$ a random sample (x_1, x_2) of size 2 is taken. Then, the best critical region (B.C.R.) is given by (where $Z_\alpha = 1.64$)

(A) $W = \{(x_1, x_2) : x_1 + x_2 \geq 4.32\}$
(B) $W = \{(x_1, x_2) : x_1 + x_2 \geq 1.64\}$
(C) $W = \{(x_1, x_2) : x_1 + x_2 \geq 2\}$
(D) $W = \{(x_1, x_2) : x_1 + x_2 \geq 3.96\}$

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57. If X is a random variable such that,

$$P(X \leq x) = \begin{cases} 0 & ;x < 0 \\ 1 - e^{-x\theta} & ;x \geq 0 \end{cases}$$

based on 'n' independent observations on X, the Maximum Likelihood Estimator (MLE) of E(X) is

(A) $\sum x_i$
(B) $\bar{x}$
(C) $\frac{1}{\bar{x}}$
(D) $\frac{1}{\sum x_i}$

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58. If the two regression lines are given by $8X - 10Y + 66 = 0$ and $40X - 18Y = 264$, then the correlation coefficient between X and Y is:

(A) 0.424
(B) 0.524
(C) -0.492
(D) 0.6

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59. If, $U = \frac{X-a}{h}$, $V = \frac{Y-b}{k}$; $a, b, h, k > 0$, then b_{UV} is

(A) b_{XY}
(B) khb_{XY}
(C) $\frac{k}{h}b_{XY}$
(D) $\frac{(k+a)}{(h+b)}b_{XY}$

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60. The correlation coefficient between two variables X and Y is 0.60 and it is given that $\sigma_X = 2, \sigma_Y = 4$. Then, the angle between two lines of regression, is

(A) $\tan^{-1}(0.2462)$
(B) $\tan^{-1}(0.4267)$
(C) $\tan^{-1}(0.6052)$
(D) $\tan^{-1}(0.90)$

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61. The regression coefficient of Mumbai prices over Kolkata prices from the following table, is

	Mumbai ()	**Kolkata ()**
Average price (per 5 kg)	120	130
S.D.	4	5
Correlation coefficient	0.6	
N (Sample size)	100	

(A) 0.48
(B) 0.40
(C) 0.53
(D) 0.60

---

62. If, $f(x, y) = xe^{-x(y+1)}; x \geq 0, y \geq 0$, then $E(Y|X = x)$ is

(A) $\frac{1}{x}$
(B) $\frac{1}{x^2} + 5$
(C) $\frac{1}{x^2}$

(D) $\frac{1}{x} + 3$

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63. For two random variables X and Y having the joint probability density function $f(x, y) = \frac{1}{3}(x + y); 0 \leq x \leq 1, 0 \leq y \leq 2$, then cov(X, Y) is

(A) $-\frac{1}{9}$
(B) $-\frac{1}{81}$
(C) $\frac{2}{3}$
(D) $-\frac{5}{9}$

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64. From the data relating to the yield of dry bark (x_1), height (x_2) and girth (x_3) for 18 cinchona plants, the correlation coefficient are obtained as $r_{12} = 0.77, r_{13} = 0.72, r_{23} = 0.52$. Then, the multiple correlation coefficient $R_{1.23}$ is

(A) 0.638
(B) 0.597
(C) 0.856
(D) 0.733

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65. If all the zero order correlation coefficients in a set of n-variates are equal to ρ, then every third order partial correlation coefficient is equal to:

(A) $\frac{2\rho}{1+\rho}$
(B) $\frac{\rho}{1+\rho}$
(C) $\frac{\rho}{1+3\rho}$
(D) ρ

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66. If under SRSWOR, $U = \sum_{i=1}^{n_1} y_i = n_1\bar{y}_1$ and $V = \sum_{j=n_1+1}^{n} y_j = (n - n_1)\bar{y}_2$, then the Var(V) is

(A) $\frac{n_1(N-(n-n_1))}{N} S^2$
(B) $\frac{(n-n_1)(N-(n-n_1))}{N} S^2$
(C) $\frac{n_1(N-(n-n_1))}{N} S^2$
(D) $\frac{(n-n_1)(N-(n-n_1))}{Nn} S^2$

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67. If $n_i \propto N_i$ and $p_i = \frac{N_i}{N}$ and k is the number of strata and N_i is the number of units in the i^{th} stratum then, Var($\bar{y}_{stratified}$) is:

(A) $\left(\frac{1}{n} - \frac{1}{N}\right) \sum_{i=1}^{k} p_i S_i^2$
(B) $\left(\frac{1}{n} - \frac{1}{N}\right) \sum_{i=1}^{k} p_i^2 S_i^2$
(C) $\frac{1}{n} \sum_{i=1}^{k} p_i S_i^2 - \frac{1}{N} \sum_{i=1}^{k} p_i^2 S_i^2$
(D) $\sum_{i=1}^{k} \left(\frac{1}{n_i} - \frac{1}{N_i}\right) p_i S_i^2$

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68. If the standard deviation of marks obtained by 150 students is 11.9, then the standard error of the estimate of the population mean for a random sample of size 30 with SRSWOR, is:

(A) 1.87
(B) 1.95
(C) 1.78
(D) 2.15

---

69. In measuring reaction times, a psychologist estimates that the standard deviation is 0.05 seconds. How large a sample of measurements should be taken in order to be 95% confident that the error of the estimate will not exceed 0.01 seconds?

(A) $n \geq 80$
(B) $n \geq 72$
(C) $n \geq 96$
(D) $n \geq 69$

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70. From a set of data involving four "tropical feed stuffs A, B, C and D", tried on 20 chics, the following information was extracted:

Source of variation	**Sum of squares**	**Degrees of freedom**
Treatment	26000	3
Error	11500	16

All the 20 chics were treated alike, except for the feeding treatment and each feeding treatment was given to 5 chics. Then, the critical difference between any two means, is: (given $t_{0.05}(16) = 2.12$)

(A) 30.95
(B) 39.50
(C) 35.94
(D) 32.80

71. It is given that there are six treatments and four blocks,

Treatment totals	T_1	T_2	T_3	T_4	T_5	T_6
	63	65	57	64	65	66
Block totals	B_1	B_2	B_3	B_4		
	90	85	106	98		

and that $G = \sum_i \sum_j y_{ij} = 380$, then the sum of squares due to treatment, is

(A) 9
(B) 18
(C) 13
(D) 17

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72. For the given ANOVA table

Source of variation	**Sum of squares**	**Degrees of freedom**
Service station	6810	9
Rating	400	4
Total	9948	49

the test statistics to test that there is no significant difference between the service stations, is

(A) 8.6
(B) 12.95
(C) 9.95
(D) 6.85

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73. Minimum number of replications required, when the coefficient of the variation for the plot values is given to be 12%, for an observed difference of 10% among the sample means to be significant at 5% level, is

(A) 5
(B) 7
(C) 8
(D) 11

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74. For the given model $x_{ijk} = \mu + \alpha_i + \beta_j + \gamma_{ij} + e_{ijk}; i = 1, \ldots, p; j = 1, \ldots, q; k = 1, \ldots, m$, under the assumption of the normality of the parent population, the p.d.f. of $y = \frac{S_{AB}^2}{\sigma_e^2}$, is

(A) Gamma with parameters $(q/2, 2)$
(B) Gamma with parameters $(pq/2, 2)$
(C) Gamma with parameters $((p-1)(q-1)/2, 2)$
(D) Gamma with parameters $((p-1)/2, 2)$

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75. For the given model $x_{ijk} = \mu + \alpha_i + \beta_j + \gamma_{ij} + e_{ijk}; i = 1, \ldots, p; j = 1, \ldots, q; k = 1, \ldots, m$, the degrees of freedom corresponding to sum of squares due to error is:

(A) $(p-1)(q-1)$
(B) $pq(m-1)$
(C) $(pqm - p - q)$
(D) $(pqm - 1)$
