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PG-EE-July, 2026

SET-X

SUBJECT : Statistics

100033

Sr. No.

Time : 1½ Hours

Max. Marks : 100

Total Questions : 100

Roll No. (in figures) _____ (in words) _____

Name _____ Father's Name _____

Mother's Name _____ Date of Examination _____

(Signature of the Candidate)

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PG-EE-July, 2026/(Statistics)(SET-X)/(A)

SEAL

1. Let $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$. The eigenvalues of A are :
- (1) 3, 0, 0 (2) 1, 1, 1
(3) 3, 3, 3 (4) 0, 0, 0
2. If A and B are $n \times n$ matrices with $\det(A) = 2$ and $\det(B) = 3$, then $\det(AB^{-1})$ equals :
- (1) 6 (2) $\frac{2}{3}$
(3) $\frac{3}{2}$ (4) 1
3. Let A be a real symmetric matrix. Then :
- (1) All eigenvalues are real (2) All eigenvalues are complex
(3) Eigenvectors are always dependent (4) $\det(A) = 0$
4. If A satisfies $A^3 - 6A^2 + 11A - 6I = 0$, then the possible eigenvalues of A are :
- (1) 1, 2, 3 (2) -1, -2, -3
(3) 0, 1, 2 (4) 1, 4, 9
5. Let V be a vector space over $\mathbb{R}$. Which of the following sets is linearly independent ?
- (1) $\{(1,0,0), (0,1,0), (1,1,0)\}$ (2) $\{(1,2,3), (2,4,6), (3,6,9)\}$
(3) $\{(1,0,0), (0,1,0), (0,0,1)\}$ (4) $\{(1,1), (2,2), (3,3)\}$
6. If A is a skew-symmetric matrix of odd order, then :
- (1) $\det(A) = 1$ (2) $\det(A) = -1$
(3) $\det(A) = 0$ (4) $\det(A) > 0$
7. The system $x + y + z = 1$, $x + y + z = 2$, $x + y + z = 3$, has :
- (1) Unique solution (2) Infinitely many solutions
(3) No solution (4) Trivial solution
8. Which of the following matrices is diagonalizable over $\mathbb{R}$?
- (1) $\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$ (2) $\begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$
(3) $\begin{bmatrix} 2 & 0 \\ 0 & 3 \end{bmatrix}$ (4) $\begin{bmatrix} 2 & 1 \\ 0 & 2 \end{bmatrix}$

9. The rank of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ 3 & 6 & 9 \end{bmatrix}$ is :

- (1) 0 (2) 1
(3) 2 (4) 3

10. The dimension of the solution space of the homogeneous system $Ax = 0$, where , A is a 5×7 matrix of rank 4, is :

- (1) 1 (2) 3
(3) 4 (4) 7

11. If $y = e^{ax} \sin bx$, then $\frac{d^2y}{dx^2}$ equals :

- (1) $e^{ax}[(a^2 - b^2) \sin bx + 2ab \cos bx]$ (2) $e^{ax}(a^2 + b^2) \sin bx$
(3) $e^{ax}(a + b)^2 \sin bx$ (4) None of these

12. The n th derivative of e^{ax} is :

- (1) $a^n e^{ax}$ (2) ne^{ax}
(3) ae^{nx} (4) a^n

13. If $f(x) = x^3 - 3x$, then the local maximum occurs at :

- (1) $x = 1$ (2) $x = -1$
(3) $x = 0$ (4) $x = 3$

14. If $z = x^2y + y^2x$, then $\frac{\partial^2 z}{\partial x \partial y}$ is :

- (1) $2x + 2y$ (2) $x + y$
(3) $2xy$ (4) $x^2 + y^2$

15. The set $\mathbb{Q}$ of rational numbers is :

- (1) Open in $\mathbb{R}$ (2) Closed in $\mathbb{R}$
(3) Neither open nor closed in $\mathbb{R}$ (4) Compact

16. If $z = x^3y^2$, then by Euler's theorem $x \frac{\partial z}{\partial x} + y \frac{\partial z}{\partial y}$ equals :

- (1) $3z$ (2) $5z$
(3) $6z$ (4) xy

A

17. The closure of the interval $(0, 1)$ in $\mathbb{R}$ is :
 (1) $(0, 1)$ (2) $(0, 1]$
 (3) $[0, 1)$ (4) $[0, 1]$
18. The value of $\int_0^1 \frac{1}{1+x^2} dx$ is :
 (1) $\frac{\pi}{2}$ (2) $\frac{\pi}{4}$
 (3) 1 (4) 0
19. The value of $\int_0^{\pi/2} \ln(\sin x) dx$ is :
 (1) $-\frac{\pi}{2} \ln 2$ (2) $\frac{\pi}{2} \ln 2$
 (3) 0 (4) $-\pi \ln 2$
20. If $z = x^2 + y^2$, then $\frac{\partial z}{\partial x}(1, 2)$ is :
 (1) 1 (2) 2
 (3) 4 (4) 8
21. The set of all limit points of $(0, 1)$ is :
 (1) $(0, 1)$ (2) $[0, 1]$
 (3) $\{0, 1\}$ (4) $\mathbb{R}$
22. The sequence $a_n = \frac{n}{n+1}$ converges to :
 (1) 0 (2) 1
 (3) ∞ (4) Does not converge
23. According to the Ratio Test, the series $\sum_{n=0}^{\infty} \frac{x^n}{n!}$ converges for :
 (1) $|x| < 1$ (2) $|x| \leq 1$
 (3) $x > 0$ (4) All real x

24. Every convergent sequence of real numbers is :
(1) Unbounded (2) Monotonic
(3) Bounded (4) Constant
25. Which of the following sequences in Cauchy ?
(1) $a_n = n$ (2) $a_n = (-1)^n$
(3) $a_n = \frac{1}{n}$ (4) $a_n = n^2$
26. A bounded function having only finitely many discontinuities on $[a, b]$ is :
(1) Not Riemann integrable (2) Riemann integrable
(3) Lebesgue integrable only (4) Unbounded
27. The differential equation $\frac{dy}{dx} + P(x)y = Q(x)$ is called :
(1) Bernoulli equation
(2) Homogeneous equation
(3) Exact equation
(4) Linear differential equation of first order
28. The integrating factor of $\frac{dy}{dx} + P(x)y = Q(x)$ is :
(1) $e^{-\int P(x)dx}$ (2) $e^{\int P(x)dx}$
(3) $\int P(x)dx$ (4) $P(x)$
29. Which of the following differential equations is separable ?
(1) $\frac{dy}{dx} = xy$ (2) $\frac{dy}{dx} + y = x$
(3) $\frac{dy}{dx} + xy = x^2$ (4) $\frac{dy}{dx} + x = y^2$
30. The degree of $\left(\frac{d^2y}{dx^2}\right)^3 + \left(\frac{dy}{dx}\right)^2 + y = 0$ is :
(1) 1 (2) 2
(3) 3 (4) 6

31. The auxiliary equation corresponding to $y'' - 5y' + 6y = 0$ is :
(1) $m^2 + 5m + 6 = 0$ (2) $m^2 - 5m + 6 = 0$
(3) $m^2 - 6 = 0$ (4) $m^2 + 6 = 0$
32. The general solution of $y'' - 5y' + 6y = 0$ is :
(1) $C_1 e^{2x} + C_2 e^{3x}$ (2) $C_1 e^{-2x} + C_2 e^{-3x}$
(3) $C_1 \sin x + C_2 \cos x$ (4) $C_1 + C_2 x$
33. The particular integral of $(D - 2)y = e^{2x}$ is :
(1) $x e^{2x}$ (2) e^{2x}
(3) $2e^{2x}$ (4) $\frac{1}{2} e^{2x}$
34. For the equation $(D^2 - 4D + 4)y = 0$, the complementary function is :
(1) $C_1 e^{2x} + C_2 x e^{2x}$ (2) $C_1 e^{-2x} + C_2 e^{2x}$
(3) $C_1 \cos 2x + C_2 \sin 2x$ (4) $C_1 + C_2 x$
35. A set S is called convex if for every $x, y \in S$:
(1) $x + y \in S$ (2) $x - y \in S$
(3) $xy \in S$ (4) $\lambda x + (1 - \lambda)y \in S, 0 \leq \lambda \leq 1$
36. In a Linear Programming Problem (LPP), the objective function is :
(1) A quadratic function (2) A linear function to be optimized
(3) A nonlinear function (4) A constant
37. A basic feasible solution of an LPP with m constraints contains at most :
(1) n basic variables (2) One variable
(3) $m + n$ variables (4) m basic variables
38. The optimum solution of an LPP, if it exists, occurs at :
(1) Any feasible point (2) A corner point of the feasible region
(3) The centroid of the feasible region (4) The origin
39. The graphical method can be used only when the number of decision variables is :
(1) One (2) More than three
(3) Three (4) Two

40. For a maximization problem, the optimality condition in the simplex method is satisfied when all $C_j - Z_j$ values are :
- (1) Positive
 - (2) Negative
 - (3) Zero or non-positive
 - (4) Infinite
41. The number of basic variables in a non-degenerate basic feasible solution equals :
- (1) Number of constraints
 - (2) Number of variables
 - (3) Rank + Number of variables
 - (4) Number of slack variables only
42. In a balanced transportation problem :
- (1) Total supply > Total demand
 - (2) Total supply < Total demand
 - (3) Total supply = Total demand
 - (4) Supply is zero
43. Which of the following methods gives an initial basic feasible solution for a transportation problem ?
- (1) Vogel's Approximation Method
 - (2) Newton's Method
 - (3) Bisection Method
 - (4) Secant Method
44. The standard method for solving an assignment problem is :
- (1) Hungarian Method
 - (2) Simplex Method
 - (3) MODI Method
 - (4) Branch and Bound Method
45. The order of convergence of the Bisection Method is :
- (1) 2
 - (2) 1.618
 - (3) 3
 - (4) 1
46. Among the following methods, the fastest convergence near a simple root is generally achieved by :
- (1) Bisection Method
 - (2) Regula-Falsi Method
 - (3) Newton-Raphson Method
 - (4) Graphical Method
47. The order of convergence of the Newton-Raphson method for a simple root is :
- (1) 1
 - (2) 4
 - (3) 3
 - (4) 2
48. The Bisection Method converges provided :
- (1) $f(a)f(b) < 0$
 - (2) $f(a)f(b) > 0$
 - (3) $f'(a) = 0$
 - (4) $f''(a) = 0$

49. Newton's backward interpolation formula is preferred when the interpolation point is :
- (1) Near the beginning
 - (2) Near the middle
 - (3) Near the end
 - (4) Outside the table
50. The $(n + 1)$ th finite difference of a polynomial of degree n is :
- (1) Constant
 - (2) One
 - (3) Zero
 - (4) Infinite
51. The central difference operator δ is defined by :
- (1) $E^{1/2} - E^{-1/2}$
 - (2) $E - 1$
 - (3) $1 - E^{-1}$
 - (4) $E + 1$
52. The backward difference operator ∇ is given by :
- (1) $f(x + h) - f(x)$
 - (2) $f(x) - f(x - h)$
 - (3) $f(x + h) + f(x)$
 - (4) $f(x + h) - f(x - h)$
53. The binary equivalent of decimal number 13 is :
- (1) 1011
 - (2) 1101
 - (3) 1110
 - (4) 1001
54. The decimal number 25 is equal to which binary number ?
- (1) 11001
 - (2) 10101
 - (3) 10011
 - (4) 11101
55. Machine language is :
- (1) High-level language
 - (2) Assembly language
 - (3) Binary language understood directly by the computer
 - (4) Object-oriented language
56. In MS Word, the shortcut key for "Copy" is :
- (1) Ctrl + X
 - (2) Ctrl + V
 - (3) Ctrl + C
 - (4) Ctrl + A
57. Which MS Office tool is mainly used for presentations ?
- (1) MS Word
 - (2) MS Outlook
 - (3) MS Excel
 - (4) MS PowerPoint

58. Which of the following is *not* a fundamental data type in C ?
(1) int (2) char
(3) float (4) string
59. 'What is the output of the following C statement ?
int x = 5;
printf("%d", x++);
(1) 5 (2) 6
(3) Compilation error (4) Garbage value
60. Which of the following declarations is valid in C ?
(1) float int x; (2) int 2x;
(3) double x; (4) integer x;
61. The primary objective of conducting a census is to :
(1) Calculate national income only
(2) Obtain comprehensive demographic and socio-economic information
(3) Conduct market surveys
(4) Estimate inflation
62. Which method is generally used in the Population Census of India ?
(1) Sample Survey Method (2) Complete Enumeration Method
(3) Quota Sampling (4) Cluster Sampling
63. The apex organization of the Indian Statistical System is :
(1) RBI
(2) NITI Aayog
(3) Ministry of Statistics and Programme Implementation (MOSPI)
(4) SEBI
64. Which of the following is a limitation of official statistics ?
(1) Wide coverage (2) Uniform methodology
(3) Time lag in publication (4) Legal backing
65. An index number is primarily used to measure :
(1) Absolute change (2) Relative change
(3) Population size (4) Variance

66. If the price elasticity of demand is greater than 1, demand is said to be :
(1) Perfectly inelastic (2) Inelastic
(3) Unit elastic (4) Elastic
67. Infant Mortality Rate (IMR) is the number of deaths of infants under one year of age per :
(1) 100 live births (2) 1000 population
(3) 10,000 live births (4) 1000 live births
68. Total Fertility Rate (TFR) represents :
(1) Total births in a year
(2) Average number of children a woman would bear during her reproductive life
(3) Births per 1000 women
(4) Births per district
69. Crude Birth Rate (CBR) is defined as :
(1) Births per 100 women aged 15-49 (2) Births per 1000 population
(3) Births per 1000 married women (4) Births per 1000 infants
70. Which index number satisfies both Time Reversal and Factor Reversal Tests ?
(1) Laspeyres Index (2) Paasche Index
(3) Fisher's Ideal Index (4) Simple Aggregative Index
71. If A and B are mutually exclusive events, then :
(1) $P(A \cap B) = 1$ (2) $P(A \cap B) = 0$
(3) $P(A \cup B) = 0$ (4) $P(A) = P(B)$
72. If $P(A) = 0.6$, $P(B) = 0.5$ and $P(A \cap B) = 0.3$, then $P(A \cup B) =$
(1) 0.2 (2) 0.8
(3) 1.4 (4) 0.6
73. A box contains 3 red and 2 blue balls. One ball is drawn at random. The probability of drawing a blue ball is :
(1) $2/5$ (2) $3/5$
(3) $1/2$ (4) $1/5$
74. Bayes' theorem is mainly used to compute :
(1) Prior probability (2) Posterior probability
(3) Joint probability (4) Marginal probability

75. For a discrete random variable X :

- | | |
|--------------------------|---------------------|
| (1) $\sum p(x) = 0$ | (2) $\sum p(x) = n$ |
| (3) $\sum p(x) = \infty$ | (4) $\sum p(x) = 1$ |

76. The expectation of a constant c is :

- | | |
|---------|-----------|
| (1) 0 | (2) 1 |
| (3) c | (4) c^2 |

77. The first derivative of MGF at $t = 0$ gives :

- | | |
|--------------|----------|
| (1) Variance | (2) Mode |
| (3) Median | (4) Mean |

78. The MGF of a random variable X is defined as :

- | | |
|--------------|-----------------|
| (1) $E(X^t)$ | (2) $E(e^{tx})$ |
| (3) $E(t^x)$ | (4) $E(X + t)$ |

79. The variance of a Binomial distribution is :

- | | |
|----------|-------------|
| (1) np | (2) $n^2 p$ |
| (3) pq | (4) npq |

80. For a Poisson distribution :

- | | |
|---------------------|---------------------|
| (1) Mean = Variance | (2) Mean > Variance |
| (3) Mean < Variance | (4) Variance = 0 |

81. If $X \sim \text{Geometric}(p)$, then $P(X = x) =$

- | | |
|-----------------------|-------------------|
| (1) p^x | (2) $(1 - p)^x p$ |
| (3) $(1 - p)^{x-1} p$ | (4) xp |

82. The exponential distribution possesses the property :

- | | |
|-------------------|---------------------|
| (1) Symmetry | (2) Memorylessness |
| (3) Skewness zero | (4) Bounded support |

83. For the standard normal distribution, $\text{Var}(Z) =$

- | | |
|-------|-----------|
| (1) 0 | (2) 1 |
| (3) 2 | (4) π |

84. The normal distribution is :

- | | |
|-----------------------|------------------------------|
| (1) Positively skewed | (2) Negatively skewed |
| (3) Uniform | (4) Symmetric about its mean |

85. If a fair die is rolled once, the probability of obtaining a prime number is :
(1) $1/6$ (2) $1/3$
(3) $2/3$ (4) $1/2$
86. The first central moment about the mean is :
(1) 1 (2) Variance
(3) Mean (4) 0
87. Which measure of dispersion is based on quartiles ?
(1) Range (2) Variance
(3) Quartile Deviation (4) Standard Deviation
88. The geometric mean of 2, 8 and 32 is :
(1) 8 (2) 10
(3) 12 (4) 16
89. For a symmetric distribution :
(1) Mean > Median > Mode (2) Mode > Median > Mean
(3) Mean = Median = Mode (4) Mean $\neq$ Median
90. The arithmetic mean is affected most by :
(1) Mode (2) Quartiles
(3) Median (4) Extreme observations
91. A normal distribution has Kurtosis coefficient β_2 equal to :
(1) 0 (2) 1
(3) 2 (4) 3
92. Spearman's rank correlation coefficient is based on :
(1) Original observations (2) Frequencies
(3) Ranks (4) Means
93. If one regression coefficient is greater than 1, the other must be :
(1) Greater than 1 (2) Equal to 1
(3) Less than 1 (4) Zero
94. The principle of least squares minimizes :
(1) Sum of deviations (2) Sum of absolute deviations
(3) Sum of squared residuals (4) Sum of frequencies

95. For fitting a parabola by least squares, the model is usually :

- | | |
|-------------------------|-------------------|
| (1) $y = a + bx$ | (2) $y = ax + b$ |
| (3) $y = a + bx + cx^2$ | (4) $y = ae^{bx}$ |

96. If $b_{xy} = 0.64$ and $b_{yx} = 0.81$, then the correlation coefficient is :

- | | |
|----------|----------|
| (1) 0.72 | (2) 0.81 |
| (3) 0.64 | (4) 0.90 |

97. For a moderately skewed distribution, Karl Pearson's coefficient of skewness is :

$$Sk = \frac{3(\bar{x} - \text{Median})}{\sigma}$$

This formula is used when :

- | | |
|-------------------------|----------------------|
| (1) Mode is ill-defined | (2) Mean is unknown |
| (3) Median is unknown | (4) Variance is zero |

98. If $r = 0$, then the regression lines are :

- | | |
|----------------|---------------------------------|
| (1) Coincident | (2) Parallel to coordinate axes |
| (3) Identical | (4) Perpendicular to each other |

99. The coefficient of variation is most useful for :

- | | |
|---------------------------|---|
| (1) Measuring skewness | (2) Finding regression coefficients |
| (3) Measuring correlation | (4) Comparing variability of different series |

100. The sum of deviations from arithmetic mean is :

- | | |
|--------------|--------------|
| (1) Positive | (2) Negative |
| (3) Zero | (4) One |

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SEAL

1. If A and B are mutually exclusive events, then :
 - (1) $P(A \cap B) = 1$
 - (2) $P(A \cap B) = 0$
 - (3) $P(A \cup B) = 0$
 - (4) $P(A) = P(B)$
2. If $P(A) = 0.6$, $P(B) = 0.5$ and $P(A \cap B) = 0.3$, then $P(A \cup B) =$
 - (1) 0.2
 - (2) 0.8
 - (3) 1.4
 - (4) 0.6
3. A box contains 3 red and 2 blue balls. One ball is drawn at random. The probability of drawing a blue ball is :
 - (1) $2/5$
 - (2) $3/5$
 - (3) $1/2$
 - (4) $1/5$
4. Bayes' theorem is mainly used to compute :
 - (1) Prior probability
 - (2) Posterior probability
 - (3) Joint probability
 - (4) Marginal probability
5. For a discrete random variable X :
 - (1) $\sum p(x) = 0$
 - (2) $\sum p(x) = n$
 - (3) $\sum p(x) = \infty$
 - (4) $\sum p(x) = 1$
6. The expectation of a constant c is :
 - (1) 0
 - (2) 1
 - (3) c
 - (4) c^2
7. The first derivative of MGF at $t = 0$ gives :
 - (1) Variance
 - (2) Mode
 - (3) Median
 - (4) Mean
8. The MGF of a random variable X is defined as :
 - (1) $E(X^t)$
 - (2) $E(e^{tx})$
 - (3) $E(t^x)$
 - (4) $E(X + t)$
9. The variance of a Binomial distribution is :
 - (1) np
 - (2) $n^2 p$
 - (3) pq
 - (4) npq

10. For a Poisson distribution :
(1) Mean = Variance (2) Mean > Variance
(3) Mean < Variance (4) Variance = 0
11. The central difference operator δ is defined by :
(1) $E^{1/2} - E^{-1/2}$ (2) $E - 1$
(3) $1 - E^{-1}$ (4) $E + 1$
12. The backward difference operator ∇ is given by :
(1) $f(x + h) - f(x)$ (2) $f(x) - f(x - h)$
(3) $f(x + h) + f(x)$ (4) $f(x + h) - f(x - h)$
13. The binary equivalent of decimal number 13 is :
(1) 1011 (2) 1101
(3) 1110 (4) 1001
14. The decimal number 25 is equal to which binary number ?
(1) 11001 (2) 10101
(3) 10011 (4) 11101
15. Machine language is :
(1) High-level language
(2) Assembly language
(3) Binary language understood directly by the computer
(4) Object-oriented language
16. In MS Word, the shortcut key for "Copy" is :
(1) Ctrl + X (2) Ctrl + V
(3) Ctrl + C (4) Ctrl + A
17. Which MS Office tool is mainly used for presentations ?
(1) MS Word (2) MS Outlook
(3) MS Excel (4) MS PowerPoint
18. Which of the following is **not** a fundamental data type in C ?
(1) int (2) char
(3) float (4) string

19. 'What is the output of the following C statement ?
int x = 5;
printf("%d", x++);
(1) 5 (2) 6
(3) Compilation error (4) Garbage value
20. Which of the following declarations is valid in C ?
(1) float int x; (2) int 2x;
(3) double x; (4) integer x;
21. The auxiliary equation corresponding to $y'' - 5y' + 6y = 0$ is :
(1) $m^2 + 5m + 6 = 0$ (2) $m^2 - 5m + 6 = 0$
(3) $m^2 - 6 = 0$ (4) $m^2 + 6 = 0$
22. The general solution of $y'' - 5y' + 6y = 0$ is :
(1) $C_1 e^{2x} + C_2 e^{3x}$ (2) $C_1 e^{-2x} + C_2 e^{-3x}$
(3) $C_1 \sin x + C_2 \cos x$ (4) $C_1 + C_2 x$
23. The particular integral of $(D - 2)y = e^{2x}$ is :
(1) $x e^{2x}$ (2) e^{2x}
(3) $2e^{2x}$ (4) $\frac{1}{2} e^{2x}$
24. For the equation $(D^2 - 4D + 4)y = 0$, the complementary function is :
(1) $C_1 e^{2x} + C_2 x e^{2x}$ (2) $C_1 e^{-2x} + C_2 e^{2x}$
(3) $C_1 \cos 2x + C_2 \sin 2x$ (4) $C_1 + C_2 x$
25. A set S is called convex if for every $x, y \in S$:
(1) $x + y \in S$ (2) $x - y \in S$
(3) $xy \in S$ (4) $\lambda x + (1 - \lambda)y \in S, 0 \leq \lambda \leq 1$
26. In a Linear Programming Problem (LPP), the objective function is :
(1) A quadratic function (2) A linear function to be optimized
(3) A nonlinear function (4) A constant

27. A basic feasible solution of an LPP with m constraints contains at most :
 (1) n basic variables (2) One variable
 (3) $m + n$ variables (4) m basic variables
28. The optimum solution of an LPP, if it exists, occurs at :
 (1) Any feasible point (2) A corner point of the feasible region
 (3) The centroid of the feasible region (4) The origin
29. The graphical method can be used only when the number of decision variables is :
 (1) One (2) More than three
 (3) Three (4) Two ,
30. For a maximization problem, the optimality condition in the simplex method is satisfied when all $C_j - Z_j$ values are :
 (1) Positive (2) Negative
 (3) Zero or non-positive (4) Infinite
31. If $y = e^{ax} \sin bx$, then $\frac{d^2y}{dx^2}$ equals :
 (1) $e^{ax}[(a^2 - b^2) \sin bx + 2ab \cos bx]$ (2) $e^{ax}(a^2 + b^2) \sin bx$
 (3) $e^{ax}(a + b)^2 \sin bx$ (4) None of these
32. The n th derivative of e^{ax} is :
 (1) $a^n e^{ax}$ (2) ne^{ax}
 (3) ae^{nx} (4) a^n
33. If $f(x) = x^3 - 3x$, then the local maximum occurs at :
 (1) $x = 1$ (2) $x = -1$
 (3) $x = 0$ (4) $x = 3$
34. If $z = x^2y + y^2x$, then $\frac{\partial^2 z}{\partial x \partial y}$ is :
 (1) $2x + 2y$ (2) $x + y$
 (3) $2xy$ (4) $x^2 + y^2$

35. The set $\mathbb{Q}$ of rational numbers is :
(1) Open in $\mathbb{R}$ (2) Closed in $\mathbb{R}$
(3) Neither open nor closed in $\mathbb{R}$ (4) Compact
36. If $z = x^3 y^2$, then by Euler's theorem $x \frac{\partial z}{\partial x} + y \frac{\partial z}{\partial y}$ equals :
(1) $3z$ (2) $5z$
(3) $6z$ (4) xy
37. The closure of the interval $(0, 1)$ in $\mathbb{R}$ is :
(1) $(0, 1)$ (2) $(0, 1]$
(3) $[0, 1)$ (4) $[0, 1]$
38. The value of $\int_0^1 \frac{1}{1+x^2} dx$ is :
(1) $\frac{\pi}{2}$ (2) $\frac{\pi}{4}$
(3) 1 (4) 0
39. The value of $\int_0^{\pi/2} \ln(\sin x) dx$ is :
(1) $-\frac{\pi}{2} \ln 2$ (2) $\frac{\pi}{2} \ln 2$
(3) 0 (4) $-\pi \ln 2$
40. If $z = x^2 + y^2$, then $\frac{\partial z}{\partial x}(1, 2)$ is :
(1) 1 (2) 2
(3) 4 (4) 8
41. A normal distribution has Kurtosis coefficient β_2 equal to :
(1) 0 (2) 1
(3) 2 (4) 3

42. Spearman's rank correlation coefficient is based on :
 (1) Original observations (2) Frequencies
 (3) Ranks (4) Means
43. If one regression coefficient is greater than 1, the other must be :
 (1) Greater than 1 (2) Equal to 1
 (3) Less than 1 (4) Zero
44. The principle of least squares minimizes :
 (1) Sum of deviations (2) Sum of absolute deviations
 (3) Sum of squared residuals (4) Sum of frequencies
45. For fitting a parabola by least squares, the model is usually :
 (1) $y = a + bx$ (2) $y = ax + b$
 (3) $y = a + bx + cx^2$ (4) $y = ae^{bx}$
46. If $b_{xy} = 0.64$ and $b_{yx} = 0.81$, then the correlation coefficient is :
 (1) 0.72 (2) 0.81
 (3) 0.64 (4) 0.90
47. For a moderately skewed distribution, Karl Pearson's coefficient of skewness is :

$$Sk = \frac{3(\bar{x} - \text{Median})}{\sigma}$$

 This formula is used when :
 (1) Mode is ill-defined (2) Mean is unknown
 (3) Median is unknown (4) Variance is zero
48. If $r = 0$, then the regression lines are :
 (1) Coincident (2) Parallel to coordinate axes
 (3) Identical (4) Perpendicular to each other
49. The coefficient of variation is most useful for :
 (1) Measuring skewness (2) Finding regression coefficients
 (3) Measuring correlation (4) Comparing variability of different series
50. The sum of deviations from arithmetic mean is :
 (1) Positive (2) Negative
 (3) Zero (4) One

51. The primary objective of conducting a census is to :
(1) Calculate national income only
(2) Obtain comprehensive demographic and socio-economic information
(3) Conduct market surveys
(4) Estimate inflation
52. Which method is generally used in the Population Census of India ?
(1) Sample Survey Method
(2) Complete Enumeration Method
(3) Quota Sampling
(4) Cluster Sampling
53. The apex organization of the Indian Statistical System is :
(1) RBI
(2) NITI Aayog
(3) Ministry of Statistics and Programme Implementation (MOSPI)
(4) SEBI
54. Which of the following is a limitation of official statistics ?
(1) Wide coverage
(2) Uniform methodology
(3) Time lag in publication
(4) Legal backing
55. An index number is primarily used to measure :
(1) Absolute change
(2) Relative change
(3) Population size
(4) Variance
56. If the price elasticity of demand is greater than 1, demand is said to be :
(1) Perfectly inelastic
(2) Inelastic
(3) Unit elastic
(4) Elastic
57. Infant Mortality Rate (IMR) is the number of deaths of infants under one year of age per :
(1) 100 live births
(2) 1000 population
(3) 10,000 live births
(4) 1000 live births
58. Total Fertility Rate (TFR) represents :
(1) Total births in a year
(2) Average number of children a woman would bear during her reproductive life
(3) Births per 1000 women
(4) Births per district

59. Crude Birth Rate (CBR) is defined as :
(1) Births per 100 women aged 15-49 (2) Births per 1000 population
(3) Births per 1000 married women (4) Births per 1000 infants
60. Which index number satisfies both Time Reversal and Factor Reversal Tests ?
(1) Laspeyres Index (2) Paasche Index
(3) Fisher's Ideal Index (4) Simple Aggregative Index
61. If $X \sim \text{Geometric}(p)$, then $P(X = x) =$
(1) p^x (2) $(1-p)^x p$
(3) $(1-p)^{x-1} p$ (4) xp
62. The exponential distribution possesses the property :
(1) Symmetry (2) Memorylessness
(3) Skewness zero (4) Bounded support
63. For the standard normal distribution, $\text{Var}(Z) =$
(1) 0 (2) 1
(3) 2 (4) π
64. The normal distribution is :
(1) Positively skewed (2) Negatively skewed
(3) Uniform (4) Symmetric about its mean
65. If a fair die is rolled once, the probability of obtaining a prime number is :
(1) $1/6$ (2) $1/3$
(3) $2/3$ (4) $1/2$
66. The first central moment about the mean is :
(1) 1 (2) Variance
(3) Mean (4) 0
67. Which measure of dispersion is based on quartiles ?
(1) Range (2) Variance
(3) Quartile Deviation (4) Standard Deviation
68. The geometric mean of 2, 8 and 32 is :
(1) 8 (2) 10
(3) 12 (4) 16

69. For a symmetric distribution :
- | | |
|--------------------------|--------------------------|
| (1) Mean > Median > Mode | (2) Mode > Median > Mean |
| (3) Mean = Median = Mode | (4) Mean $\neq$ Median |
70. The arithmetic mean is affected most by :
- | | |
|------------|--------------------------|
| (1) Mode | (2) Quartiles |
| (3) Median | (4) Extreme observations |
71. The number of basic variables in a non-degenerate basic feasible solution equals :
- | | |
|--------------------------------|------------------------------------|
| (1) Number of constraints | (2) Number of variables |
| (3) Rank + Number of variables | (4) Number of slack variables only |
72. In a balanced transportation problem :
- | | |
|---------------------------------|---------------------------------|
| (1) Total supply > Total demand | (2) Total supply < Total demand |
| (3) Total supply = Total demand | (4) Supply is zero |
73. Which of the following methods gives an initial basic feasible solution for a transportation problem ?
- | | |
|----------------------------------|---------------------|
| (1) Vogel's Approximation Method | (2) Newton's Method |
| (3) Bisection Method | (4) Secant Method |
74. The standard method for solving an assignment problem is :
- | | |
|----------------------|-----------------------------|
| (1) Hungarian Method | (2) Simplex Method |
| (3) MODI Method | (4) Branch and Bound Method |
75. The order of convergence of the Bisection Method is :
- | | |
|-------|-----------|
| (1) 2 | (2) 1.618 |
| (3) 3 | (4) 1 |
76. Among the following methods, the fastest convergence near a simple root is generally achieved by :
- | | |
|---------------------------|-------------------------|
| (1) Bisection Method | (2) Regula-Falsi Method |
| (3) Newton-Raphson Method | (4) Graphical Method |
77. The order of convergence of the Newton-Raphson method for a simple root is :
- | | |
|-------|-------|
| (1) 1 | (2) 4 |
| (3) 3 | (4) 2 |

78. The Bisection Method converges provided :

- | | |
|--------------------|--------------------|
| (1) $f(a)f(b) < 0$ | (2) $f(a)f(b) > 0$ |
| (3) $f'(a) = 0$ | (4) $f''(a) = 0$ |

79. Newton's backward interpolation formula is preferred when the interpolation point is :

- | | |
|------------------------|-----------------------|
| (1) Near the beginning | (2) Near the middle |
| (3) Near the end | (4) Outside the table |

80. The $(n + 1)$ th finite difference of a polynomial of degree n is :

- | | |
|--------------|--------------|
| (1) Constant | (2) One |
| (3) Zero | (4) Infinite |

81. The set of all limit points of $(0, 1)$ is :

- | | |
|----------------|------------------|
| (1) $(0, 1)$ | (2) $[0, 1]$ |
| (3) $\{0, 1\}$ | (4) $\mathbb{R}$ |

82. The sequence $a_n = \frac{n}{n+1}$ converges to :

- | | |
|--------------|-----------------------|
| (1) 0 | (2) 1 |
| (3) ∞ | (4) Does not converge |

83. According to the Ratio Test, the series $\sum_{n=0}^{\infty} \frac{x^n}{n!}$ converges for :

- | | |
|---------------|------------------|
| (1) $ x < 1$ | (2) $ x \leq 1$ |
| (3) $x > 0$ | (4) All real x |

84. Every convergent sequence of real numbers is :

- | | |
|---------------|---------------|
| (1) Unbounded | (2) Monotonic |
| (3) Bounded | (4) Constant |

85. Which of the following sequences is Cauchy ?

- | | |
|-------------------------|--------------------|
| (1) $a_n = n$ | (2) $a_n = (-1)^n$ |
| (3) $a_n = \frac{1}{n}$ | (4) $a_n = n^2$ |

86. A bounded function having only finitely many discontinuities on $[a, b]$ is :
(1) Not Riemann integrable (2) Riemann integrable
(3) Lebesgue integrable only (4) Unbounded
87. The differential equation $\frac{dy}{dx} + P(x)y = Q(x)$ is called :
(1) Bernoulli equation
(2) Homogeneous equation
(3) Exact equation
(4) Linear differential equation of first order
88. The integrating factor of $\frac{dy}{dx} + P(x)y = Q(x)$ is :
(1) $e^{-\int P(x)dx}$ (2) $e^{\int P(x)dx}$
(3) $\int P(x)dx$ (4) $P(x)$
89. Which of the following differential equations is separable ?
(1) $\frac{dy}{dx} = xy$ (2) $\frac{dy}{dx} + y = x$
(3) $\frac{dy}{dx} + xy = x^2$ (4) $\frac{dy}{dx} + x = y^2$
90. The degree of $\left(\frac{d^2y}{dx^2}\right)^3 + \left(\frac{dy}{dx}\right)^2 + y = 0$ is :
(1) 1 (2) 2
(3) 3 (4) 6
91. Let $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$. The eigenvalues of A are :
(1) 3, 0, 0 (2) 1, 1, 1
(3) 3, 3, 3 (4) 0, 0, 0
92. If A and B are $n \times n$ matrices with $\det(A) = 2$ and $\det(B) = 3$, then $\det(AB^{-1})$ equals :
(1) 6 (2) $\frac{2}{3}$
(3) $\frac{3}{2}$ (4) 1

93. Let A be a real symmetric matrix. Then :
- (1) All eigenvalues are real (2) All eigenvalues are complex
(3) Eigenvectors are always dependent (4) $\det(A) = 0$
94. If A satisfies $A^3 - 6A^2 + 11A - 6I = 0$, then the possible eigenvalues of A are :
- (1) 1, 2, 3 (2) -1, -2, -3
(3) 0, 1, 2 (4) 1, 4, 9
95. Let V be a vector space over $\mathbb{R}$. Which of the following sets is linearly independent ?
- (1) $\{(1,0,0), (0,1,0), (1,1,0)\}$ (2) $\{(1,2,3), (2,4,6), (3,6,9)\}$
(3) $\{(1,0,0), (0,1,0), (0,0,1)\}$ (4) $\{(1,1), (2,2), (3,3)\}$
96. If A is a skew-symmetric matrix of odd order, then :
- (1) $\det(A) = 1$ (2) $\det(A) = -1$
(3) $\det(A) = 0$ (4) $\det(A) > 0$
97. The system $x + y + z = 1$, $x + y + z = 2$, $x + y + z = 3$, has :
- (1) Unique solution (2) Infinitely many solutions
(3) No solution (4) Trivial solution
98. Which of the following matrices is diagonalizable over $\mathbb{R}$?
- (1) $\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$ (2) $\begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$
(3) $\begin{bmatrix} 2 & 0 \\ 0 & 3 \end{bmatrix}$ (4) $\begin{bmatrix} 2 & 1 \\ 0 & 2 \end{bmatrix}$
99. The rank of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ 3 & 6 & 9 \end{bmatrix}$ is :
- (1) 0 (2) 1
(3) 2 (4) 3
100. The dimension of the solution space of the homogeneous system $Ax = 0$, where A is a 5×7 matrix of rank 4, is :
- (1) 1 (2) 3
(3) 4 (4) 7

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C

SET-X

PG-EE-July, 2026

SUBJECT : Statistics

100003

Sr. No.

Time : 1¼ Hours

Max. Marks : 100

Total Questions : 100

Roll No. (in figures) _____ (in words) _____

Name _____ Father's Name _____

Mother's Name _____ Date of Examination _____

(Signature of the Candidate)

(Signature of the Invigilator)

**CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE
STARTING THE QUESTION PAPER.**

1. Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Discrepancy, if any, should be immediately reported to the invigilator and should ask for replacement of Question booklet/OMR Answer Sheet. **Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after start of the examination.**
2. All questions are compulsory. There will be no negative marking. Each correct answer will be awarded one full mark.
3. For each question, four suggested answer (1), (2), (3), (4) are given. The candidate is to choose only one answer which he/she considers the correct or best one. If the candidate darkens more than one circle or cutting/over writing/erasing, then such answer(s) shall not be evaluated.
4. The candidate **MUST NOT** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the space provided in the end of question booklet. Answers **MUST NOT** be ticked in the Question booklet.
5. Use only Black or Blue **BALL POINT PEN** of good quality in the OMR Answer-Sheet.
6. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
7. Question Booklet(s) along with answer key(s) of all the A, B, C & D codes will be got uploaded on the university website after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case, will be considered.
8. The candidates must return the Question booklet as well as Original OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / misbehaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.

PG-EE-July, 2026/(Statistics)(SET-X)/(C)

SEA

1. If $y = e^{ax} \sin bx$, then $\frac{d^2y}{dx^2}$ equals :
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(1) $\frac{\pi}{2}$ (2) $\frac{\pi}{4}$
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$$Sk = \frac{3(\bar{x} - \text{Median})}{\sigma}$$

This formula is used when :

- (1) Mode is ill-defined
 - (2) Mean is unknown
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 - (4) Variance is zero
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 - (3) Measuring correlation
 - (4) Comparing variability of different series
20. The sum of deviations from arithmetic mean is :
- (1) Positive
 - (2) Negative
 - (3) Zero
 - (4) One
21. If A and B are mutually exclusive events, then :
- (1) $P(A \cap B) = 1$
 - (2) $P(A \cap B) = 0$
 - (3) $P(A \cup B) = 0$
 - (4) $P(A) = P(B)$
22. If $P(A) = 0.6$, $P(B) = 0.5$ and $P(A \cap B) = 0.3$, then $P(A \cup B) =$
- (1) 0.2
 - (2) 0.8
 - (3) 1.4
 - (4) 0.6
23. A box contains 3 red and 2 blue balls. One ball is drawn at random. The probability of drawing a blue ball is :
- (1) $2/5$
 - (2) $3/5$
 - (3) $1/2$
 - (4) $1/5$
24. Bayes' theorem is mainly used to compute :
- (1) Prior probability
 - (2) Posterior probability
 - (3) Joint probability
 - (4) Marginal probability
25. For a discrete random variable X :
- (1) $\sum p(x) = 0$
 - (2) $\sum p(x) = n$
 - (3) $\sum p(x) = \infty$
 - (4) $\sum p(x) = 1$

26. The expectation of a constant c is :
(1) 0 (2) 1
(3) c (4) c^2
27. The first derivative of MGF at $t = 0$ gives :
(1) Variance (2) Mode
(3) Median (4) Mean
28. The MGF of a random variable X is defined as :
(1) $E(X^t)$ (2) $E(e^{tx})$
(3) $E(t^x)$ (4) $E(X + t)$
29. The variance of a Binomial distribution is :
(1) np (2) $n^2 p$
(3) pq (4) npq
30. For a Poisson distribution :
(1) Mean = Variance
(2) Mean > Variance
(3) Mean < Variance
(4) Variance = 0
31. The central difference operator δ is defined by :
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32. The backward difference operator ∇ is given by :
(1) $f(x + h) - f(x)$ (2) $f(x) - f(x - h)$
(3) $f(x + h) + f(x)$ (4) $f(x + h) - f(x - h)$
33. The binary equivalent of decimal number 13 is :
(1) 1011 (2) 1101
(3) 1110 (4) 1001
34. The decimal number 25 is equal to which binary number ?
(1) 11001 (2) 10101
(3) 10011 (4) 11101

35. Machine language is :
(1) High-level language
(2) Assembly language
(3) Binary language understood directly by the computer
(4) Object-oriented language
36. In MS Word, the shortcut key for "Copy" is :
(1) Ctrl + X
(2) Ctrl + V
(3) Ctrl + C
(4) Ctrl + A
37. Which MS Office tool is mainly used for presentations ?
(1) MS Word
(2) MS Outlook
(3) MS Excel
(4) MS PowerPoint
38. Which of the following is **not** a fundamental data type in C ?
(1) int
(2) char
(3) float
(4) string
39. 'What is the output of the following C statement ?
int x = 5;
printf("%d", x++);
(1) 5
(2) 6
(3) Compilation error
(4) Garbage value
40. Which of the following declarations is valid in C ?
(1) float int x;
(2) int 2x;
(3) double x;
(4) integer x;
41. The auxiliary equation corresponding to $y'' - 5y' + 6y = 0$ is :
(1) $m^2 + 5m + 6 = 0$
(2) $m^2 - 5m + 6 = 0$
(3) $m^2 - 6 = 0$
(4) $m^2 + 6 = 0$
42. The general solution of $y'' - 5y' + 6y = 0$ is :
(1) $C_1 e^{2x} + C_2 e^{3x}$
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43. The particular integral of $(D - 2)y = e^{2x}$ is :
(1) $x e^{2x}$
(2) e^{2x}
(3) $2e^{2x}$
(4) $\frac{1}{2} e^{2x}$

44. For the equation $(D^2 - 4D + 4)y = 0$, the complementary function is :
- (1) $C_1 e^{2x} + C_2 x e^{2x}$ (2) $C_1 e^{-2x} + C_2 e^{2x}$
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45. A set S is called convex if for every $x, y \in S$:
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 (3) $xy \in S$ (4) $\lambda x + (1 - \lambda)y \in S, 0 \leq \lambda \leq 1$
46. In a Linear Programming Problem (LPP), the objective function is :
- (1) A quadratic function (2) A linear function to be optimized
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47. A basic feasible solution of an LPP with m constraints contains at most :
- (1) n basic variables (2) One variable
 (3) $m + n$ variables (4) m basic variables
48. The optimum solution of an LPP, if it exists, occurs at :
- (1) Any feasible point (2) A corner point of the feasible region
 (3) The centroid of the feasible region (4) The origin
49. The graphical method can be used only when the number of decision variables is :
- (1) One (2) More than three
 (3) Three (4) Two
50. For a maximization problem, the optimality condition in the simplex method is satisfied when all $C_j - Z_j$ values are :
- (1) Positive (2) Negative
 (3) Zero or non-positive (4) Infinite
51. The set of all limit points of $(0, 1)$ is :
- (1) $(0, 1)$ (2) $[0, 1]$
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60. The degree of $\left(\frac{d^2y}{dx^2}\right)^3 + \left(\frac{dy}{dx}\right)^2 + y = 0$ is :
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 (1) Laspeyres Index (2) Paasche Index
 (3) Fisher's Ideal Index (4) Simple Aggregative Index
81. Let $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$. The eigenvalues of A are :
 (1) 3, 0, 0 (2) 1, 1, 1
 (3) 3, 3, 3 (4) 0, 0, 0
82. If A and B are $n \times n$ matrices with $\det(A) = 2$ and $\det(B) = 3$, then $\det(AB^{-1})$ equals :
 (1) 6 (2) $\frac{2}{3}$
 (3) $\frac{3}{2}$ (4) 1
83. Let A be a real symmetric matrix. Then :
 (1) All eigenvalues are real (2) All eigenvalues are complex
 (3) Eigenvectors are always dependent (4) $\det(A) = 0$
84. If A satisfies $A^3 - 6A^2 + 11A - 6I = 0$, then the possible eigenvalues of A are :
 (1) 1, 2, 3 (2) -1, -2, -3
 (3) 0, 1, 2 (4) 1, 4, 9

85. Let V be a vector space over $\mathbb{R}$. Which of the following sets is linearly independent ?
- (1) $\{(1,0,0), (0,1,0), (1,1,0)\}$ (2) $\{(1,2,3), (2,4,6), (3,6,9)\}$
 (3) $\{(1,0,0), (0,1,0), (0,0,1)\}$ (4) $\{(1,1), (2,2), (3,3)\}$
86. If A is a skew-symmetric matrix of odd order, then :
- (1) $\det(A) = 1$ (2) $\det(A) = -1$
 (3) $\det(A) = 0$ (4) $\det(A) > 0$
87. The system $x + y + z = 1$, $x + y + z = 2$, $x + y + z = 3$, has :
- (1) Unique solution (2) Infinitely many solutions
 (3) No solution (4) Trivial solution
88. Which of the following matrices is diagonalizable over $\mathbb{R}$?
- (1) $\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$ (2) $\begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$
 (3) $\begin{bmatrix} 2 & 0 \\ 0 & 3 \end{bmatrix}$ (4) $\begin{bmatrix} 2 & 1 \\ 0 & 2 \end{bmatrix}$
89. The rank of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ 3 & 6 & 9 \end{bmatrix}$ is :
- (1) 0 (2) 1
 (3) 2 (4) 3
90. The dimension of the solution space of the homogeneous system $Ax = 0$, where A is a 5×7 matrix of rank 4, is :
- (1) 1 (2) 3
 (3) 4 (4) 7
91. If $X \sim \text{Geometric}(p)$, then $P(X = x) =$
- (1) p^x (2) $(1-p)^x p$
 (3) $(1-p)^{x-1} p$ (4) xp
92. The exponential distribution possesses the property :
- (1) Symmetry (2) Memorylessness
 (3) Skewness zero (4) Bounded support

93. For the standard normal distribution, $\text{Var}(Z) =$
(1) 0 (2) 1
(3) 2 (4) π
94. The normal distribution is :
(1) Positively skewed (2) Negatively skewed
(3) Uniform (4) Symmetric about its mean
95. If a fair die is rolled once, the probability of obtaining a prime number is :
(1) $1/6$ (2) $1/3$
(3) $2/3$ (4) $1/2$
96. The first central moment about the mean is :
(1) 1 (2) Variance
(3) Mean (4) 0
97. Which measure of dispersion is based on quartiles ?
(1) Range (2) Variance
(3) Quartile Deviation (4) Standard Deviation
98. The geometric mean of 2, 8 and 32 is :
(1) 8 (2) 10
(3) 12 (4) 16
99. For a symmetric distribution :
(1) $\text{Mean} > \text{Median} > \text{Mode}$ (2) $\text{Mode} > \text{Median} > \text{Mean}$
(3) $\text{Mean} = \text{Median} = \text{Mode}$ (4) $\text{Mean} \neq \text{Median}$
100. The arithmetic mean is affected most by :
(1) Mode (2) Quartiles
(3) Median (4) Extreme observations

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PG-EE-July, 2026

SET-X

SUBJECT : Statistics

100036

Sr. No.

Time : 1¼ Hours

Max. Marks : 100

Total Questions : 100

Roll No. (in figures) _____ (in words) _____

Name _____ Father's Name _____

Mother's Name _____ Date of Examination _____

(Signature of the Candidate)

(Signature of the Invigilator)

**CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE
STARTING THE QUESTION PAPER.**

1. Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Discrepancy, if any, should be immediately reported to the invigilator and should ask for replacement of Question booklet/OMR Answer Sheet. **Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after start of the examination.**
2. All questions are compulsory. There will be no negative marking. Each correct answer will be awarded one full mark.
3. For each question, four suggested answer (1), (2), (3), (4) are given. The candidate is to choose only one answer which he/she considers the correct or best one. If the candidate darkens more than one circle or cutting/over writing/erasing, then such answer(s) shall not be evaluated.
4. The candidate **MUST NOT** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the space provided in the end of question booklet. Answers **MUST NOT** be ticked in the Question booklet.
5. Use only Black or Blue **BALL POINT PEN** of good quality in the OMR Answer-Sheet.
6. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
7. Question Booklet(s) along with answer key(s) of all the A, B, C & D codes will be got uploaded on the university website after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case, will be considered.
8. The candidates must return the Question booklet as well as Original OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / misbehaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.

PG-EE-July, 2026/(Statistics)(SET-X)/(D)

SEAL

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(1) 1

(2) 2

(3) 3

(4) 6

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(1) 3, 0, 0

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22. If A and B are $n \times n$ matrices with $\det(A) = 2$ and $\det(B) = 3$, then $\det(AB^{-1})$ equals :

(1) 6

(2) $\frac{2}{3}$

(3) $\frac{3}{2}$

(4) 1

23. Let A be a real symmetric matrix. Then :

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31. A normal distribution has Kurtosis coefficient β_2 equal to :
- (1) 0 (2) 1
 (3) 2 (4) 3
32. Spearman's rank correlation coefficient is based on :
- (1) Original observations (2) Frequencies
 (3) Ranks (4) Means

33. If one regression coefficient is greater than 1, the other must be :
(1) Greater than 1 (2) Equal to 1
(3) Less than 1 (4) Zero
34. The principle of least squares minimizes :
(1) Sum of deviations (2) Sum of absolute deviations
(3) Sum of squared residuals (4) Sum of frequencies
35. For fitting a parabola by least squares, the model is usually :
(1) $y = a + bx$ (2) $y = ax + b$
(3) $y = a + bx + cx^2$ (4) $y = ae^{bx}$
36. If $b_{xy} = 0.64$ and $b_{yx} = 0.81$, then the correlation coefficient is :
(1) 0.72 (2) 0.81
(3) 0.64 (4) 0.90
37. For a moderately skewed distribution, Karl Pearson's coefficient of skewness is :
$$Sk = \frac{3(\bar{x} - Median)}{\sigma}$$

This formula is used when :
(1) Mode is ill-defined (2) Mean is unknown
(3) Median is unknown (4) Variance is zero
38. If $r = 0$, then the regression lines are :
(1) Coincident (2) Parallel to coordinate axes
(3) Identical (4) Perpendicular to each other
39. The coefficient of variation is most useful for :
(1) Measuring skewness (2) Finding regression coefficients
(3) Measuring correlation (4) Comparing variability of different series
40. The sum of deviations from arithmetic mean is :
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(3) $m + n$ variables (4) m basic variables
58. The optimum solution of an LPP, if it exists, occurs at :
(1) Any feasible point (2) A corner point of the feasible region
(3) The centroid of the feasible region (4) The origin

59. The graphical method can be used only when the number of decision variables is :
(1) One (2) More than three
(3) Three (4) Two ,
60. For a maximization problem, the optimality condition in the simplex method is satisfied when all $C_j - Z_j$ values are :
(1) Positive (2) Negative
(3) Zero or non-positive (4) Infinite
61. If A and B are mutually exclusive events, then :
(1) $P(A \cap B) = 1$ (2) $P(A \cap B) = 0$
(3) $P(A \cup B) = 0$ (4) $P(A) = P(B)$
62. If $P(A) = 0.6$, $P(B) = 0.5$ and $P(A \cap B) = 0.3$, then $P(A \cup B) =$
(1) 0.2 (2) 0.8
(3) 1.4 (4) 0.6
63. A box contains 3 red and 2 blue balls. One ball is drawn at random. The probability of drawing a blue ball is :
(1) $2/5$ (2) $3/5$
(3) $1/2$ (4) $1/5$
64. Bayes' theorem is mainly used to compute :
(1) Prior probability (2) Posterior probability
(3) Joint probability (4) Marginal probability
65. For a discrete random variable X :
(1) $\sum p(x) = 0$ (2) $\sum p(x) = n$
(3) $\sum p(x) = \infty$ (4) $\sum p(x) = 1$
66. The expectation of a constant c is :
(1) 0 (2) 1
(3) c (4) c^2
67. The first derivative of MGF at $t = 0$ gives :
(1) Variance (2) Mode
(3) Median (4) Mean

68. The MGF of a random variable X is defined as :

- (1) $E(X^t)$
- (2) $E(e^{tx})$
- (3) $E(t^x)$
- (4) $E(X + t)$

69. The variance of a Binomial distribution is :

- (1) np
- (2) $n^2 p$
- (3) pq
- (4) npq

70. For a Poisson distribution :

- (1) Mean = Variance
- (2) Mean > Variance
- (3) Mean < Variance
- (4) Variance = 0

71. If $X \sim \text{Geometric}(p)$, then $P(X = x) =$

- (1) p^x
- (2) $(1 - p)^x p$
- (3) $(1 - p)^{x-1} p$
- (4) xp

72. The exponential distribution possesses the property :

- (1) Symmetry
- (2) Memorylessness
- (3) Skewness zero
- (4) Bounded support

73. For the standard normal distribution, $\text{Var}(Z) =$

- (1) 0
- (2) 1
- (3) 2
- (4) π

74. The normal distribution is :

- (1) Positively skewed
- (2) Negatively skewed
- (3) Uniform
- (4) Symmetric about its mean

75. If a fair die is rolled once, the probability of obtaining a prime number is :

- (1) $1/6$
- (2) $1/3$
- (3) $2/3$
- (4) $1/2$

76. The first central moment about the mean is :

- (1) 1
- (2) Variance
- (3) Mean
- (4) 0

77. Which measure of dispersion is based on quartiles ?

- (1) Range
- (2) Variance
- (3) Quartile Deviation
- (4) Standard Deviation

78. The geometric mean of 2, 8 and 32 is :
(1) 8 (2) 10
(3) 12 (4) 16
79. For a symmetric distribution :
(1) Mean > Median > Mode (2) Mode > Median > Mean
(3) Mean = Median = Mode (4) Mean $\neq$ Median
80. The arithmetic mean is affected most by :
(1) Mode (2) Quartiles
(3) Median (4) Extreme observations
81. If $y = e^{ax} \sin bx$, then $\frac{d^2y}{dx^2}$ equals :
(1) $e^{ax}[(a^2 - b^2) \sin bx + 2ab \cos bx]$ (2) $e^{ax}(a^2 + b^2) \sin bx$
(3) $e^{ax}(a + b)^2 \sin bx$ (4) None of these
82. The n th derivative of e^{ax} is :
(1) $a^n e^{ax}$ (2) ne^{ax}
(3) ae^{nx} (4) a^n
83. If $f(x) = x^3 - 3x$, then the local maximum occurs at :
(1) $x = 1$ (2) $x = -1$
(3) $x = 0$ (4) $x = 3$
84. If $z = x^2y + y^2x$, then $\frac{\partial^2 z}{\partial x \partial y}$ is :
(1) $2x + 2y$ (2) $x + y$
(3) $2xy$ (4) $x^2 + y^2$
85. The set $\mathbb{Q}$ of rational numbers is :
(1) Open in $\mathbb{R}$ (2) Closed in $\mathbb{R}$
(3) Neither open nor closed in $\mathbb{R}$ (4) Compact
86. If $z = x^3y^2$, then by Euler's theorem $x \frac{\partial z}{\partial x} + y \frac{\partial z}{\partial y}$ equals :
(1) $3z$ (2) $5z$
(3) $6z$ (4) xy

87. The closure of the interval $(0, 1)$ in $\mathbb{R}$ is :
(1) $(0, 1)$ (2) $(0, 1]$
(3) $[0, 1)$ (4) $[0, 1]$
88. The value of $\int_0^1 \frac{1}{1+x^2} dx$ is :
(1) $\frac{\pi}{2}$ (2) $\frac{\pi}{4}$
(3) 1 (4) 0
89. The value of $\int_0^{\pi/2} \ln(\sin x) dx$ is :
(1) $-\frac{\pi}{2} \ln 2$ (2) $\frac{\pi}{2} \ln 2$
(3) 0 (4) $-\pi \ln 2$
90. If $z = x^2 + y^2$, then $\frac{\partial z}{\partial x}(1, 2)$ is :
(1) 1 (2) 2
(3) 4 (4) 8
91. The central difference operator δ is defined by :
(1) $E^{1/2} - E^{-1/2}$ (2) $E - 1$
(3) $1 - E^{-1}$ (4) $E + 1$
92. The backward difference operator ∇ is given by :
(1) $f(x+h) - f(x)$ (2) $f(x) - f(x-h)$
(3) $f(x+h) + f(x)$ (4) $f(x+h) - f(x-h)$
93. The binary equivalent of decimal number 13 is :
(1) 1011 (2) 1101
(3) 1110 (4) 1001
94. The decimal number 25 is equal to which binary number ?
(1) 11001 (2) 10101
(3) 10011 (4) 11101

95. Machine language is :
(1) High-level language
(2) Assembly language
(3) Binary language understood directly by the computer
(4) Object-oriented language
96. In MS Word, the shortcut key for "Copy" is :
(1) Ctrl + X
(2) Ctrl + V
(3) Ctrl + C
(4) Ctrl + A
97. Which MS Office tool is mainly used for presentations ?
(1) MS Word
(2) MS Outlook
(3) MS Excel
(4) MS PowerPoint
98. Which of the following is **not** a fundamental data type in C ?
(1) int
(2) char
(3) float
(4) string
99. 'What is the output of the following C statement ?
int x = 5;
printf("%d", x++);
(1) 5
(2) 6
(3) Compilation error
(4) Garbage value
100. Which of the following declarations is valid in C ?
(1) float int x;
(2) int 2x;
(3) double x;
(4) integer x;

Answer key of M.Sc. (Statistics) entrance exam dated 16.07.2026

Q. NO.	A	B	C	D
1	1	2	1	1
2	2	2	1	3
3	1	1	2	1
4	1	2	1	1
5	3	4	3	4
6	3	3	2	3
7	3	4	4	4
8	3	2	2	1
9	2	4	1	3
10	2	1	2	3
11	1	1	4	2
12	1	2	3	2
13	2	2	3	4
14	1	1	3	3
15	3	3	3	3
16	2	3	1	2
17	4	4	1	4
18	2	4	4	2
19	1	1	4	1
20	2	3	3	3
21	2	2	2	1
22	2	1	2	2
23	4	1	1	1
24	3	1	2	1
25	3	4	4	3
26	2	2	3	3
27	4	4	4	3
28	2	2	2	3
29	1	4	4	2
30	3	3	1	2
31	2	1	1	4
32	1	1	2	3
33	1	2	2	3
34	1	1	1	3
35	4	3	3	3
36	2	2	3	1
37	4	4	4	1
38	2	2	4	4
39	4	1	1	4
40	3	2	3	3
41	1	4	2	2
42	3	3	1	2
43	1	3	1	3
44	1	3	1	3
45	4	3	4	2
46	3	1	2	4
47	4	1	4	4
48	1	4	2	2
49	3	4	4	2
50	3	3	3	3

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Janika
16/7/26

Answer key of M.Sc. (Statistics) entrance exam dated 16.07.2026

Q. NO.	A	B	C	D
51	1	2	2	2
52	2	2	2	1
53	2	3	4	1
54	1	3	3	1
55	3	2	3	4
56	3	4	2	2
57	4	4	4	4
58	4	2	2	2
59	1	2	1	4
60	3	3	3	3
61	2	3	1	2
62	2	2	3	2
63	3	2	1	1
64	3	4	1	2
65	2	4	4	4
66	4	4	3	3
67	4	3	4	4
68	2	1	1	2
69	2	3	3	4
70	3	4	3	1
71	2	1	2	3
72	2	3	2	2
73	1	1	3	2
74	2	1	3	4
75	4	4	2	4
76	3	3	4	4
77	4	4	4	3
78	2	1	2	1
79	4	3	2	3
80	1	3	3	4
81	3	2	1	1
82	2	2	2	1
83	2	4	1	2
84	4	3	1	1
85	4	3	3	3
86	4	2	3	2
87	3	4	3	4
88	1	2	3	2
89	3	1	2	1
90	4	3	2	2
91	4	1	3	1
92	3	2	2	2
93	3	1	2	2
94	3	1	4	1
95	3	3	4	3
96	1	3	4	3
97	1	3	3	4
98	4	3	1	4
99	4	2	3	1
100	3	2	4	3

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