

SET-“X”

(Total No. of printed pages : 28)

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DO SO)

(PG-EE-2022)

10009

Code

A

STATISTICS

Sr. No. _____

Time : 1¼ Hours

Total Questions : 100

Max. Marks : 100

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

Name : _____ Father's Name : _____

Mother's Name : _____ Date of Examination : _____

(Signature of the candidate)

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5. The candidate **MUST NOT** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question book-let itself. Answers **MUST NOT** be ticked in the Question book-let.
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Question No.	Questions	Question No.
1.	<p>For a subspace W of a finite dimensional vector space $V(F)$, $\text{Dim} \left(\frac{V}{W} \right)$ is equal to</p> <p>(1) $\text{Dim } V - \text{Dim } W$ (2) $\text{Dim } V$</p> <p>(3) $\text{Dim } W$ (4) $\frac{\text{Dim } V}{\text{Dim } W}$</p>	
2.	<p>The set of ordered triplets $(a_1, a_2, 0)$ of R^3 has dimension</p> <p>(1) 1 (2) 2</p> <p>(3) 3 (4) 4</p>	
3.	<p>A set of vectors containing the null vector is</p> <p>(1) Linearly Independent (2) Linearly Dependent</p> <p>(3) Both (1) and (2) (4) None of these</p>	
4.	<p>A bijective linear transformation is called</p> <p>(1) Homomorphism (2) Monomorphism</p> <p>(3) Epimorphism (4) Isomorphism</p>	

Question No.	Questions	Question No.
5.	The matrix $\begin{bmatrix} \cos \alpha & \sin \alpha \\ -\sin \alpha & \cos \alpha \end{bmatrix}$ is (1) Unitary (2) Skew-symmetric (3) Orthogonal (4) Hermitian	
6.	The characteristic roots of the matrix $\begin{bmatrix} 2 & \sqrt{2} \\ \sqrt{2} & 1 \end{bmatrix}$ are (1) 2, 1 (2) 0, 3 (3) 1, $\sqrt{2}$ (4) 2, $\sqrt{2}$	
7.	The set of vectors $X_1 = (2, 1, 4)$, $X_2 = (-3, 2, -1)$, $X_3 = (1, -3, -2)$ is (1) Linearly dependent (2) Linearly Independent (3) Both (1) and (2) (4) None of these	
8.	The product of the eigenvalues of the matrix A is equal to (1) $ A $ (2) Trace of A (3) 1 (4) 0	

Question No.	Questions	Question No.
9.	<p>If A is a square matrix, then $A + A'$, AA' and $A'A$ are</p> <p>(1) Symmetric (2) Skew symmetric</p> <p>(3) Hermitian (4) Skew Hermitian</p>	
10.	<p>If A is an orthogonal matrix, then</p> <p>(1) $A = 0$ (2) $A = \pm 1$</p> <p>(3) $A = 1$ (4) $A = -1$</p>	
11.	<p>The mathematical expression for continuity of a function is</p> <p>(1) $\lim_{x \rightarrow c} f(x) = f(c), \forall c \in [a, b]$ (2) $\lim_{x \rightarrow c} f(x) = f(c), \forall c \in (a, b)$</p> <p>(3) $\lim_{x \rightarrow c} f(x) = f(c), \forall c \in [a, b]$ (4) $\lim_{x \rightarrow c} f(x) = f(c), \forall c \in (a, b)$</p>	
12.	<p>For $2x + 3y = \sin x$, then value of $\frac{dy}{dx}$ is</p> <p>(1) $\frac{\cos x - 2}{3}$ (2) $\frac{\cos x - 2}{2x}$</p> <p>(3) $\frac{\tan x - 3}{3}$ (4) $\frac{\sin x - 2}{3}$</p>	

Question No.	Questions	Question No.
16.	<p>The integral $\int_0^{\frac{\pi}{2}} \sin^4 x \cos^2 x \, dx$ is</p> <p>(1) $\frac{\pi}{32}$ (2) $\frac{1}{16}$</p> <p>(3) $\frac{\pi}{16}$ (4) $\frac{1}{32}$</p>	16.
17.	<p>The name of the property $\int_a^b f(x) \, dx = \int_b^a f(x) \, dx$ is</p> <p>(1) Reverse integral property (2) Adding intervals property</p> <p>(3) Zero interval property (4) Adding integrand property</p>	17.
18.	<p>At the point $x = 0$, the function $f(x) = x , -1 \leq x \leq 1$ is</p> <p>(1) Continuous and differentiable</p> <p>(2) Non-continuous and differentiable</p> <p>(3) Continuous and non-differentiable</p> <p>(4) Neither continuous nor differentiable</p>	18.

Question No.	Questions
22.	<p>The n^{th} order ordinary linear homogeneous differential equation has</p> <p>(1) n-singular solutions (2) no singular solution</p> <p>(3) one singular solution (4) $(n - 1)$ singular solution</p>
23.	<p>The differential equation $\frac{d^2y}{dx^2} + \frac{dy}{dx} - 2y = 0$ has the solution</p> <p>(1) $y = c_1 e^{-2x} + c_2 e^x$ (2) $y = c e^{-2x}$</p> <p>(3) $y = c_1 e^{-2x} + c_2 e^{-x} + c_3$ (4) $y = c_1 e^{-2x} + c_2 e^{2x}$</p>
24.	<p>The equation $\frac{dy}{dx} + Py = Q$ is linear differential equation of first order if</p> <p>(1) P, Q are functions of x only</p> <p>(2) P, Q are the functions of y only</p> <p>(3) P, Q are the functions of x and y</p> <p>(4) P, Q are the functions of none of x and y</p>

Question No.	Questions
31.	$\lim_{n \rightarrow \infty} n^{\frac{1}{n}}$ is equal to (1) 1 (2) 0 (3) e (4) Log 2
32.	The set $\{(-1)^n n\}$ is (1) Bounded below but not above (2) Bounded above but not below (3) Bounded (4) Neither bounded below nor bounded above
33.	If $f(x) = \frac{1}{x^2}$ on $[1, 4]$, then the values of $L[f, P]$ and $U[f, P]$ for the partition $P = \{1, 2, 3, 4\}$ of $[1, 4]$ are (1) $\frac{9}{144}, \frac{7}{36}$ (2) $\frac{61}{144}, \frac{49}{36}$ (3) $\frac{13}{144}, \frac{9}{36}$ (4) None of these

Question No.	Questions
34.	<p>If $f: [a, b] \rightarrow \mathbb{R}$ is a bounded function and $P, P' \in \mathcal{P}[a, b]$ such that $P \subset P'$, then which of the following is true ?</p> <p>(1) $L(f, P') \geq L(f, P)$ (2) $U(f, P') \leq U(f, P)$ (3) $L(f, P') \leq L(f, P)$ (4) Both (1) and (2) are true</p>
35.	<p>Every infinite bounded set of real numbers has a limit point. This result is known as</p> <p>(1) Heine-Borel Theorem (2) Cauchy Ist theorem on limits (3) Cauchy 2nd theorem on limits (4) Bolzano-Weierstrass theorem</p>
36.	<p>The series $\sum_{n=1}^{\infty} \cos\left(\frac{1}{n}\right)$ is</p> <p>(1) Convergent (2) Divergent (3) Oscillating finitely (4) Oscillating infinitely</p>
37.	<p>A set of values of decision variables which satisfies the linear constraints and non-negativity conditions of a LPP is called its</p> <p>(1) Unbounded solution (2) Optimum solution (3) Feasible solution (4) None of these</p>

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45.	<p>The bisection method is applied to compute a zero of the function $f(x) = x^4 - x^3 - x^2 - 4$ in the interval $[1, 9]$. The method converges to a solution after :</p> <p>(1) First iteration (2) Three iterations (3) Two iterations (4) Five iterations</p>
46.	<p>If $f(x) = x^2$, then the second order divided difference for the points x_0, x_1, x_2 will be</p> <p>(1) -1 (2) $-\frac{1}{x_1 - x_0}$ (3) 1 (4) $\frac{1}{x_2 - x_1}$</p>
47.	<p>The order of convergence of Newton-Raphson method is</p> <p>(1) 2 (2) 3 (3) 0 (4) 1</p>
48.	<p>The second approximation to a root of the equation $x^2 - x - 1 = 0$ in the interval $(1, 2)$ by bisection method will be</p> <p>(1) 1.9 (2) 2.35 (3) 1.75 (4) 1.5</p>

Question No.	Questions
49.	<p>The Newton-Raphson method is also called as</p> <p>(1) Tangent method (2) Secant method</p> <p>(3) Chord method (4) Diameter method</p>
50.	<p>Newton's formula for backward differences with usual notations is</p> <p>(1) $y_x = y_0 + \sum_{r=1}^n \binom{u}{r} \Delta^r y_0$ (2) $y_x = y_0 + \sum_{r=1}^{n-1} \binom{u+r}{r} \nabla^r y_r$</p> <p>(3) $y_x = y_0 + \sum_{r=1}^n \binom{u+r-1}{r} \nabla^r y_0$ (4) None of these</p>
51.	<p>Interpolation provides good estimates of missing values if and only if:</p> <p>(1) The change of values is consistent</p> <p>(2) The series does not refer to abnormal periods</p> <p>(3) The arguments are equidistant</p> <p>(4) All of the above</p>
52.	<p>The third difference of a cubic $\Delta^3 y$ function are</p> <p>(1) Constant (2) Non constant</p> <p>(3) Variables (4) None of the above</p>

Question No.	Questions
53.	Who is the father of Computer ? (1) Allan Turing (2) Charles Babbage (3) Simur Cary (4) Augusta Adaming
54.	CD-ROM stands for (1) Compactable Read Only Memory (2) Compact Data Read Only Memory (3) Compactable Disk Read Only Memory (4) Compact Disk Read Only Memory
55.	Which of the following is the binary equivalent of the decimal number 35 ? (1) 10001 (2) 100101 (3) 100011 (4) 101001
56.	What is unit of information ? (1) Bit (2) Bite (3) Gram (4) Hertz

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61.	<p>The word 'Statistics' is used as</p> <p>(1) Singular (2) Plural</p> <p>(3) Singular and Plural (4) None of these</p>
62.	<p>In an exclusive type distribution, the limits excluded are :</p> <p>(1) Lower limits</p> <p>(2) Upper limits</p> <p>(3) Either of the lower or upper limits</p> <p>(4) Lower and upper limits both</p>
63.	<p>With the help of the Ogive curve, one can determine :</p> <p>(1) Median (2) Deciles</p> <p>(3) Percentiles (4) All the above</p>
64.	<p>The most appropriate diagram to represent the data relating to the monthly expenditure on different items by a family is :</p> <p>(1) Histogram (2) Pie Chart</p> <p>(3) Frequency Polygon (4) Line graph</p>

Question No.	Questions
65.	<p>The correct relationship between A.M., G.M. and H.M. is :</p> <p>(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.</p>
66.	<p>For a group of 100 candidates, the mean was found to be 40. Later on, it was discovered that a value 45 was misread as 54. The correct mean is :</p> <p>(1) 40.50 (2) 39.85 (3) 39.80 (4) 39.91</p>
67.	<p>The correct formula for variance of 'n' sample observations x_1, x_2, \dots, x_n is</p> <p>(1) $\frac{1}{n-1} \sum_i (x_i - \bar{x})^2$ (2) $\frac{1}{n-1} \sum_i (x_i^2 - \bar{x}^2)$ (3) $\frac{1}{n} \sum_i (x_i - \bar{x})^2$ (4) $\frac{1}{n} \sum_i (x_i^2 - \bar{x}^2)$</p>
68.	<p>Average wages of workers of a factory are Rs. 550 per month and the standard deviation of wages is 110. The coefficient of variation is</p> <p>(1) 30% (2) 15% (3) 500% (4) 20%</p>

Question No.	Questions
69.	<p>In case of positive skewed distribution, the relation between mean, median and mode is :</p> <p>(1) Median > Mean > Mode (2) Mean > Median > Mode (3) Mean = Median = Mode (4) 2 Mean = 1.5 Median = Mode</p>
70.	<p>The idea of product moment correlation was given by :</p> <p>(1) R.A. Fisher (2) Sir Francis Galton (3) Karl Pearson (4) Spearman</p>
71.	<p>Standard error of the sample correlation coefficient 'r' is based on 'n' paired values is :</p> <p>(1) $\frac{1+r^2}{\sqrt{n}}$ (2) $\frac{1+r^2}{n}$ (3) $\frac{1-r^2}{\sqrt{n}}$ (4) $\frac{1+r^2}{\sqrt{n-1}}$</p>
72.	<p>If the value of multiple correlation coefficient is near to 1, it leads to the conclusion that :</p> <p>(1) There is a lack of linear relationship (2) Linear relation is a good fit (3) There is a curvilinear relation (4) All of the above</p>

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73.	<p>Regression coefficient is independent of :</p> <p>(1) Origin (2) Scale</p> <p>(3) Both origin and scale (4) Neither origin nor scale</p>
74.	<p>The function $Y = a + bX + cX^2 + dX^3$ represents :</p> <p>(1) A hyperbola (2) An exponential curve</p> <p>(3) A parabola (4) Gompertz curve</p>
75.	<p>The mean deviation of the set of numbers 12, 6, 7, 3, 15, 10, 18, 5 is :</p> <p>(1) 3.25 (2) 2.25</p> <p>(3) 4.25 (4) 5.25</p>
76.	<p>If 'X' is a random variable with its mean \bar{X}, then the expression $E(X - \bar{X})^2$ represents</p> <p>(1) The variance of 'X' (2) Second Central moment</p> <p>(3) Both (1) and (2) (4) The standard deviation of 'X'</p>

Question No.	Questions
77.	<p>If 'X' is a random variable having its probability density function (pdf) $f(x)$, then $E\left(\frac{1}{X}\right)$ is called</p> <p>(1) Arithmetic Mean (2) First Quartile (3) Harmonic Mean (4) All of these</p>
78.	<p>The Probability function $f(x)$, $-\infty < x < \infty$ is said to be probability density function if :</p> <p>(1) $\int_{-\infty}^{\infty} f(x) dx - 1 \neq 0$ (2) $\int_{-\infty}^{\infty} f(x) dx = 1$ (3) $\int_0^{\infty} f(x) dx = 1$ (4) $\int_{-\infty}^{\infty} f(x) dx = 0$</p>
79.	<p>Let X be a continuous r.v. with pdf</p> $f(x) = \begin{cases} a_x & ; 0 \leq x \leq 1 \\ a & ; 1 \leq x \leq 2 \\ -ax + 3a & ; 2 \leq x \leq 3 \\ 0 & ; x > 3 \end{cases}$ <p>then the value of 'a' is</p> <p>(1) 0.4 (2) 0.5 (3) 0.3 (4) 0.1</p>

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88.	<p>Which of the following is true ?</p> <p>(1) $E(aX + b) = a E(X)$ (2) $E(aX + bY) = aE(X) + b$</p> <p>(3) $E(aX + bY) = aE(X) + b E(Y)$ (4) All of the above</p>
89.	<p>Two dice are rolled by two players A and B. A throws 10, the probability that B throws more than A is</p> <p>(1) $\frac{1}{12}$ (2) $\frac{1}{6}$</p> <p>(3) $\frac{1}{18}$ (4) $\frac{1}{16}$</p>
90.	<p>The mean of Binomial distribution B (n, p) is</p> <p>(1) np (2) np - 1</p> <p>(3) np + 1 (4) 1 - np</p>
91.	<p>When was the first census held in India ?</p> <p>(1) 1870 (2) 1871</p> <p>(3) 1872 (4) 1874</p>

Question No.	Questions
92.	<p>Which of the following is not a division of NSSO ?</p> <p>(1) Coordination and publication Division</p> <p>(2) Field Data Division</p> <p>(3) Data Processing Division</p> <p>(4) Survey Design and Research Design</p>
93.	<p>The purchasing power of money is</p> <p>(1) Reciprocal of price index number</p> <p>(2) Equal to price index number</p> <p>(3) Twice the price index number</p> <p>(4) Unequal to price index number</p>
94.	<p>Fisher's ideal formula does not satisfy :</p> <p>(1) Time reversal test (2) Circular test</p> <p>(3) Factor reversal test (4) Unit test</p>
95.	<p>Which index number satisfies factor reversal test ?</p> <p>(1) Paasche's Index (2) Laspeyre's Index</p> <p>(3) Fisher's Ideal Index (4) Walsh Price Index</p>

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4.	<p>The function $Y = a + bX + cX^2 + dX^3$ represents :</p> <p>(1) A hyperbola (2) An exponential curve</p> <p>(3) A parabola (4) Gompertz curve</p>
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9.	<p>Let X be a continuous r.v. with pdf</p> $f(x) = \begin{cases} a_x & ; 0 \leq x \leq 1 \\ a & ; 1 \leq x \leq 2 \\ -ax + 3a & ; 2 \leq x \leq 3 \\ 0 & ; x > 3 \end{cases}$ <p>then the value of 'a' is</p> <p>(1) 0.4 (2) 0.5</p> <p>(3) 0.3 (4) 0.1</p>								
10.	<p>Let X be a random variable with the following probability distribution :</p> <table border="1" data-bbox="363 1406 1070 1599"> <tr> <td>x</td> <td>-3</td> <td>6</td> <td>9</td> </tr> <tr> <td>P(X=x)</td> <td>$\frac{1}{6}$</td> <td>$\frac{1}{2}$</td> <td>$\frac{1}{3}$</td> </tr> </table> <p>The value of $E(X^2)$ is</p> <p>(1) 43.5 (2) 45.37</p> <p>(3) 46.5 (4) 43.4</p>	x	-3	6	9	P(X=x)	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{3}$
x	-3	6	9						
P(X=x)	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{3}$						

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16.	What is unit of information? (1) Bit (2) Bite (3) Gram (4) Hertz
17.	Which shortcut key is used, to find a particular word in a word document? (1) CTRL+S (2) CTRL+F (3) CTRL+R (4) CTRL+Y
18.	VGA is (1) Video Graphics Array (2) Visual Graphics Array (3) Volatile Graphics Array (4) Video Graphics Adapter
19.	What does USB stand for? (1) Universal Signal Board (2) Universal Signal Bus (3) Universal Serial Bus (4) Universal Serial Board

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20.	<p>Which of the following is the correct abbreviation of COMPUTER ?</p> <p>(1) Commonly Occupied Machines used in Technical and Education Research</p> <p>(2) Commonly Operated Machines used in Technical and Environmental Research</p> <p>(3) Commonly Oriented Machines used in Technical and Education Research</p> <p>(4) Commonly Operated Machines used in Technical and Educational Research</p>
21.	<p>If $X \sim N(\mu, \sigma^2)$, then the standard normal variate is distributed as</p> <p>(1) $N(0, \sigma^2)$ (2) $N(\mu, \sigma^2)$</p> <p>(3) $N(0, 1)$ (4) $N(\mu, 0)$</p>
22.	<p>The moment generating function of Poisson distribution is</p> <p>(1) $e^{\lambda(e^t - 1)}$ (2) $e^{t(e^\lambda - 1)}$</p> <p>(3) $e^t - 1$ (4) $e^{\lambda(1 - e^t)}$</p>
23.	<p>The distribution function of the exponential distribution with parameter 'λ' is given by</p> <p>(1) $e^{-\lambda x}$ (2) $e^{-\lambda x} - 1$</p> <p>(3) $1 - e^{-\lambda x}$ (4) $-e^{-\lambda x}$</p>

Question No.	Questions
24.	Which of the following is the mode of the rectangular distribution with parameter A and B ? (1) $\frac{A+B}{2}$ (2) $\frac{A-B}{2}$ (3) Mode does not exist (4) A + B
25.	The Quartile Deviation of the normal distribution is (1) Q.D. = $\frac{1}{2}\sigma$ (2) Q.D. = $\frac{2}{3}\sigma$ (3) Q.D. = $\frac{2}{5}\sigma$ (4) Q.D. = $\frac{3}{4}\sigma$
26.	If A and B are two independent events, then $P(\bar{A} \cap \bar{B})$ is equal to (1) $P(\bar{A}) P(\bar{B})$ (2) $1 - P(A \cup B)$ (3) $[1 - P(A)] [1 - P(B)]$ (4) All of these
27.	The moment generating function of the geometric distribution is (1) $\frac{q}{1 - qe^t}$ (2) $\frac{qp}{1 - qe^t}$ (3) $\frac{p}{1 - qe^t}$ (4) $\frac{q}{1 - pe^t}$

Question No.	Questions
28.	<p>Which of the following is true ?</p> <p>(1) $E(aX + b) = a E(X)$ (2) $E(aX + bY) = aE(X) + b$</p> <p>(3) $E(aX + bY) = aE(X) + b E(Y)$ (4) All of the above</p>
29.	<p>Two dice are rolled by two players A and B. A throws 10, the probability that B throws more than A is</p> <p>(1) $\frac{1}{12}$ (2) $\frac{1}{6}$</p> <p>(3) $\frac{1}{18}$ (4) $\frac{1}{16}$</p>
30.	<p>The mean of Binomial distribution B (n, p) is</p> <p>(1) np (2) np - 1</p> <p>(3) np + 1 (4) 1 - np</p>
31.	<p>The mathematical expression for continuity of a function is</p> <p>(1) $\lim_{x \rightarrow c} f(x) = f(c), \forall c \in [a, b]$ (2) $\lim_{x \rightarrow c} f(x) = f(c), \forall c \in (a, b)$</p> <p>(3) $\lim_{x \rightarrow c} f(x) = f(c), \forall c \in [a, b]$ (4) $\lim_{x \rightarrow c} f(x) = f(c), \forall c \in (a, b)$</p>

Question No.	Questions	Question No.
32.	<p>For $2x + 3y = \sin x$, then value of $\frac{dy}{dx}$ is</p> <p>(1) $\frac{\cos x - 2}{3}$ (2) $\frac{\cos x - 2}{2}$</p> <p>(3) $\frac{\tan x - 3}{3}$ (4) $\frac{\sin x - 2}{3}$</p>	35
33.	<p>If $x = 6 \sin^{-1} 2t$ and $y = \frac{1}{\sqrt{4-t^2}}$, then $\frac{dy}{dx}$ is</p> <p>(1) $\frac{t}{1-4t^2}$ (2) $-\frac{3}{1-4t^2}$</p> <p>(3) $\frac{t}{1-42t^2}$ (4) $\frac{1}{3(1-4t^2)}$</p>	36
34.	<p>$\lim_{x \rightarrow 0} \left(\frac{a^x + b^x}{2} \right)^{\frac{1}{x}}$ is equals to</p> <p>(1) $a + b$ (2) ab</p> <p>(3) \sqrt{ab} (4) $\frac{1}{2}$</p>	37

Question No.	Questions
35.	<p>If 'f' be a continuous and differentiable function on (a, b), then the condition for the function 'f' to be increasing is</p> <p>(1) $f'(x) < 0 \quad \forall x_1, x_2 \in (a, b)$</p> <p>(2) $f'(x) > 0 \quad \forall x_1, x_2 \in (a, b)$</p> <p>(3) $f'(x) = 0 \quad \forall x_1, x_2 \in (a, b)$</p> <p>(4) $f'(x) \geq 0 \quad \forall x_1, x_2 \in (a, b)$</p>
36.	<p>The integral $\int_0^{\frac{\pi}{2}} \sin^4 x \cos^2 x \, dx$ is</p> <p>(1) $\frac{\pi}{32}$</p> <p>(2) $\frac{1}{16}$</p> <p>(3) $\frac{\pi}{16}$</p> <p>(4) $\frac{1}{32}$</p>
37.	<p>The name of the property $\int_a^b f(x) \, dx = \int_b^a f(x) \, dx$ is</p> <p>(1) Reverse integral property</p> <p>(2) Adding intervals property</p> <p>(3) Zero interval property</p> <p>(4) Adding integrand property</p>

Question No.	Questions	Question No.
38.	<p>At the point $x = 0$, the function $f(x) = x$, $-1 \leq x \leq 1$ is</p> <p>(1) Continuous and differentiable</p> <p>(2) Non-continuous and differentiable</p> <p>(3) Continuous and non-differentiable</p> <p>(4) Neither continuous nor differentiable</p>	
39.	<p>The function $f(x) = \frac{4-x^2}{4x-x^3}$ is</p> <p>(1) Discontinuous at one point</p> <p>(2) Discontinuous at exactly two points</p> <p>(3) Discontinuous at exactly three points</p> <p>(4) Continuous at all points</p>	
40.	<p>The integral $\int_1^2 \frac{1}{\sqrt{x^2-1}} dx$ converges to</p> <p>(1) 2</p> <p>(2) 1</p> <p>(3) 0</p> <p>(4) 3</p>	

Question No.	Questions	Question No.
45.	<p>Which index number satisfies factor reversal test ?</p> <p>(1) Paasche's Index (2) Laspeyre's Index</p> <p>(3) Fisher's Ideal Index (4) Walsh Price Index</p>	
46.	<p>In a chain base method, the base period is</p> <p>(1) Fixed (2) Not fixed</p> <p>(3) Constant (4) Zero</p>	
47.	<p>In India, the collection of vital statistics started for first time in</p> <p>(1) 720 (2) 1886</p> <p>(3) 1969 (4) 2014</p>	
48.	<p>The death rate obtained for a segment of a population is known as</p> <p>(1) Specific death rate (2) Crude death rate</p> <p>(3) Standardized rate (4) Vital index</p>	
49.	<p>The elasticity for demand of the durable goods is</p> <p>(1) Zero (2) Equal to unity</p> <p>(3) Greater than unity (4) Less than unity</p>	

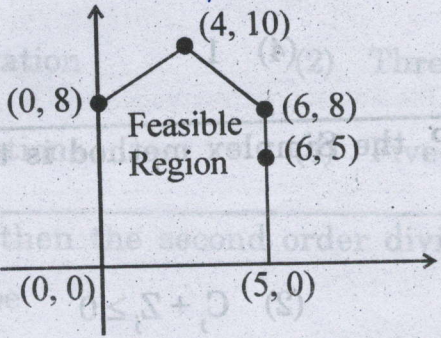
Question No.	Questions
50.	<p>When the price of a product falls by 10% and its demand rises by 30%, then the elasticity of demand is</p> <p>(1) 13 (2) 3 (3) 10 (4) 30</p>
51.	<p>The word 'Statistics' is used as</p> <p>(1) Singular (2) Plural (3) Singular and Plural (4) None of these</p>
52.	<p>In an exclusive type distribution, the limits excluded are :</p> <p>(1) Lower limits (2) Upper limits (3) Either of the lower or upper limits (4) Lower and upper limits both</p>
53.	<p>With the help of the Ogive curve, one can determine :</p> <p>(1) Median (2) Deciles (3) Percentiles (4) All the above</p>

Question No.	Questions
54.	<p>The most appropriate diagram to represent the data relating to the monthly expenditure on different items by a family is :</p> <p>(1) Histogram (2) Pie Chart (3) Frequency Polygon (4) Line graph</p>
55.	<p>The correct relationship between A.M., G.M. and H.M. is :</p> <p>(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.</p>
56.	<p>For a group of 100 candidates, the mean was found to be 40. Later on, it was discovered that a value 45 was misread as 54. The correct mean is :</p> <p>(1) 40.50 (2) 39.85 (3) 39.80 (4) 39.91</p>
57.	<p>The correct formula for variance of 'n' sample observations x_1, x_2, \dots, x_n is</p> <p>(1) $\frac{1}{n-1} \sum_i (x_i - \bar{x})^2$ (2) $\frac{1}{n-1} \sum_i (x_i^2 - \bar{x}^2)$ (3) $\frac{1}{n} \sum_i (x_i - \bar{x})^2$ (4) $\frac{1}{n} \sum_i (x_i^2 - \bar{x}^2)$</p>

Question No.	Questions
58.	<p>Average wages of workers of a factory are Rs. 550 per month and the standard deviation of wages is 110. The coefficient of variation is</p> <p>(1) 30% (2) 15% (3) 500% (4) 20%</p>
59.	<p>In case of positive skewed distribution, the relation between mean, median and mode is :</p> <p>(1) Median > Mean > Mode (2) Mean > Median > Mode (3) Mean = Median = Mode (4) 2 Mean = 1.5 Median = Mode</p>
60.	<p>The idea of product moment correlation was given by :</p> <p>(1) R.A. Fisher (2) Sir Francis Galton (3) Karl Pearson (4) Spearman</p>
61.	<p>$\lim_{n \rightarrow \infty} n^{\frac{1}{n}}$ is equal to</p> <p>(1) 1 (2) 0 (3) e (4) Log 2</p>

Question No.	Questions
62.	<p>The set $\{(-1)^n n\}$ is</p> <p>(1) Bounded below but not above</p> <p>(2) Bounded above but not below</p> <p>(3) Bounded</p> <p>(4) Neither bounded below nor bounded above</p>
63.	<p>If $f(x) = \frac{1}{x^2}$ on $[1, 4]$, then the values of $L[f, P]$ and $U[f, P]$ for the partition $P = \{1, 2, 3, 4\}$ of $[1, 4]$ are</p> <p>(1) $\frac{9}{144}, \frac{7}{36}$ (2) $\frac{61}{144}, \frac{49}{36}$</p> <p>(3) $\frac{13}{144}, \frac{9}{36}$ (4) None of these</p>
64.	<p>If $f: [a, b] \rightarrow \mathbb{R}$ is a bounded function and $P, P' \in \mathcal{P}[a, b]$ such that $P \subset P'$, then which of the following is true?</p> <p>(1) $L(f, P') \geq L(f, P)$ (2) $U(f, P') \leq U(f, P)$</p> <p>(3) $L(f, P') \leq L(f, P)$ (4) Both (1) and (2) are true</p>

Question No.	Questions
65.	<p>Every infinite bounded set of real numbers has a limit point. This result is known as</p> <p>(1) Heine-Borel Theorem (2) Cauchy Ist theorem on limits</p> <p>(3) Cauchy 2nd theorem on limits (4) Bolzano-Weierstrass theorem</p>
66.	<p>The series $\sum_{n=1}^{\infty} \cos\left(\frac{1}{n}\right)$ is</p> <p>(1) Convergent (2) Divergent</p> <p>(3) Oscillating finitely (4) Oscillating infinitely</p>
67.	<p>A set of values of decision variables which satisfies the linear constraints and non-negativity conditions of a LPP is called its</p> <p>(1) Unbounded solution (2) Optimum solution</p> <p>(3) Feasible solution (4) None of these</p>

Question No.	Questions
68.	<p>The feasible region for a LPP is shown shaded in the figure given below. If $Z = 3x - 4y$ be the objective function, then minimum of Z occurs at</p>  <p>(1) (0, 0) (2) (0, 8)</p> <p>(3) (5, 0) (4) (4, 10)</p>
69.	<p>A basic solution is called non-degenerate if</p> <p>(1) All the basic variables are zero</p> <p>(2) None of the basic variable is zero</p> <p>(3) At least one of the basic variable is zero</p> <p>(4) Atmost one of the basic variable is zero</p>
70.	<p>Linear Programming Problem (LPP) involving more than two variables can be solved by</p> <p>(1) Graphical method (2) Matrix minima method</p> <p>(3) Hungarian method (4) Simplex method</p>

Question No.	Questions
71.	<p>The coefficient of slack variable in the objective function is</p> <p>(1) $-M$ (2) M (3) 0 (4) 1</p>
72.	<p>For maximization LPP, the Simplex method is terminated when all values</p> <p>(1) $C_j - Z_j \geq 0$ (2) $C_j + Z_j \geq 0$ (3) $C_j - Z_j \leq 0$ (4) $C_j + Z_j \leq 0$</p>
73.	<p>The assignment problem is</p> <p>(1) Non-linear programming problem (2) Dynamic programming problem (3) Integer linear programming problem (4) Integer non-linear programming problem</p>
74.	<p>The solution to a Transportation Problem (TP) with 'm' rows and 'n' columns is basic feasible if number of positive allocations are</p> <p>(1) $m + n$ (2) $m - n$ (3) $m + n - 1$ (4) $m + n + 1$</p>

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75.	<p>The bisection method is applied to compute a zero of the function $f(x) = x^4 - x^3 - x^2 - 4$ in the interval $[1, 9]$. The method converges to a solution after :</p> <p>(1) First iteration (2) Three iterations (3) Two iterations (4) Five iterations</p>
76.	<p>If $f(x) = x^2$, then the second order divided difference for the points x_0, x_1, x_2 will be</p> <p>(1) -1 (2) $\frac{1}{x_1 - x_0}$ (3) 1 (4) $\frac{1}{x_2 - x_1}$</p>
77.	<p>The order of convergence of Newton-Raphson method is</p> <p>(1) 2 (2) 3 (3) 0 (4) 1</p>
78.	<p>The second approximation to a root of the equation $x^2 - x - 1 = 0$ in the interval $(1, 2)$ by bisection method will be</p> <p>(1) 1.9 (2) 2.35 (3) 1.75 (4) 1.5</p>

Question No.	Questions
79.	<p>The Newton-Raphson method is also called as</p> <p>(1) Tangent method (2) Secant method</p> <p>(3) Chord method (4) Diameter method</p>
80.	<p>Newton's formula for backward differences with usual notations is</p> <p>(1) $y_x = y_0 + \sum_{r=1}^n \binom{u}{r} \Delta^r y_0$ (2) $y_x = y_0 + \sum_{r=1}^{n-1} \binom{u+r}{r} \nabla^r y_r$</p> <p>(3) $y_x = y_0 + \sum_{r=1}^n \binom{u+r-1}{r} \nabla^r y_0$ (4) None of these</p>
81.	<p>The order and degree of the differential equation $\frac{d^2y}{dx^2} + \sqrt{1 + \left(\frac{dy}{dx}\right)^3} = 0$ are</p> <p>(1) First order, second degree</p> <p>(2) First order, first degree</p> <p>(3) Second degree, second order</p> <p>(4) Second order, first degree</p>
82.	<p>The n^{th} order ordinary linear homogeneous differential equation has</p> <p>(1) n-singular solutions (2) no singular solution</p> <p>(3) one singular solution (4) (n - 1) singular solution</p>

Question No.	Questions
83.	<p>The differential equation $\frac{d^2y}{dx^2} + \frac{dy}{dx} - 2y = 0$ has the solution</p> <p>(1) $y = c_1 e^{-2x} + c_2 e^x$ (2) $y = c e^{-2x}$</p> <p>(3) $y = c_1 e^{-2x} + c_2 e^{-x} + c_3$ (4) $y = c_1 e^{-2x} + c_2 e^{2x}$</p>
84.	<p>The equation $\frac{dy}{dx} + Py = Q$ is linear differential equation of first order if</p> <p>(1) P, Q are functions of x only</p> <p>(2) P, Q are the functions of y only</p> <p>(3) P, Q are the functions of x and y</p> <p>(4) P, Q are the functions of none of x and y</p>
85.	<p>The integrating factor for the differential equation</p> <p>$(x+1) \frac{dy}{dx} - y = e^{3x} (x+1)^2$ is</p> <p>(1) $\frac{1}{x+1}$ (2) $x+1$</p> <p>(3) $\frac{1}{x^2+1}$ (4) x^2-1</p>

Question No.	Questions
86.	<p>The necessary condition for the equation $M(x, y) dx + N(x, y) dy = 0$ to be exact is</p> <p>(1) $\frac{\partial N}{\partial y} = \frac{\partial M}{\partial x}$ (2) $\frac{\partial N}{\partial y} = -\frac{\partial M}{\partial x}$</p> <p>(3) $\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$ (4) $\frac{\partial M}{\partial y} = -\frac{\partial N}{\partial x}$</p>
87.	<p>The differential equation derived from $y = A e^{2x} + B e^{-2x}$; A and B are constants has the order</p> <p>(1) 3 (2) 1</p> <p>(3) 2 (4) 4</p>
88.	<p>The ordinary differential equation $x \frac{dy}{dx} - y = 2x^2$ with initial condition $y(0) = 0$ has</p> <p>(1) No solution (2) A unique solution</p> <p>(3) Two distinct solutions (4) An infinite number of solutions</p>

Question No.	Questions
89.	<p>Which of the following statement is true ?</p> <p>(1) The set Q of rational numbers is neighbourhood of each of its points</p> <p>(2) The set R of real numbers is neighbourhood of each of its points</p> <p>(3) The set N of natural numbers is neighbourhood of each of its points</p> <p>(4) All the above statements are true</p>
90.	<p>If $\lim_{n \rightarrow \infty} a_n^{\frac{1}{n}} = \lim_{n \rightarrow \infty} \frac{a_{n+1}}{a_n}$ provided that the limit on RHS exists. This result is known as</p> <p>(1) Heine-Borel theorem (2) Cauchy 2nd theorem on limits</p> <p>(3) Squeeze principle (4) Leibnitz's rule</p>
91.	<p>For a subspace W of a finite dimensional vector space V (F), $\text{Dim} \left(\frac{V}{W} \right)$ is equal to</p> <p>(1) $\text{Dim V} - \text{Dim W}$ (2) Dim V</p> <p>(3) Dim W (4) $\frac{\text{Dim V}}{\text{Dim W}}$</p>

Question No.	Questions
92.	<p>The set of ordered triplets $(a_1, a_2, 0)$ of R^3 has dimension</p> <p>(1) 1 (2) 2 (3) 3 (4) 4</p>
93.	<p>A set of vectors containing the null vector is</p> <p>(1) Linearly Independent (2) Linearly Dependent (3) Both (1) and (2) (4) None of these</p>
94.	<p>A bijective linear transformation is called</p> <p>(1) Homomorphism (2) Monomorphism (3) Epimorphism (4) Isomorphism</p>
95.	<p>The matrix $\begin{bmatrix} \cos \alpha & \sin \alpha \\ -\sin \alpha & \cos \alpha \end{bmatrix}$ is</p> <p>(1) Unitary (2) Skew-symmetric (3) Orthogonal (4) Hermitian</p>
96.	<p>The characteristic roots of the matrix $\begin{bmatrix} 2 & \sqrt{2} \\ \sqrt{2} & 1 \end{bmatrix}$ are</p> <p>(1) 2, 1 (2) 0, 3 (3) 1, $\sqrt{2}$ (4) 2, $\sqrt{2}$</p>

Question No.	Questions
97.	<p>The set of vectors $X_1 = (2, 1, 4)$, $X_2 = (-3, 2, -1)$, $X_3 = (1, -3, -2)$ is</p> <p>(1) Linearly dependent (2) Linearly Independent (3) Both (1) and (2) (4) None of these</p>
98.	<p>The product of the eigenvalues of the matrix A is equal to</p> <p>(1) A (2) Trace of A (3) 1 (4) 0</p>
99.	<p>If A is a square matrix, then $A + A'$, AA' and $A'A$ are</p> <p>(1) Symmetric (2) Skew symmetric (3) Hermitian (4) Skew Hermitian</p>
100.	<p>If A is an orthogonal matrix, then</p> <p>(1) $A = 0$ (2) $A = \pm 1$ (3) $A = 1$ (4) $A = -1$</p>

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Sr. No. 10007

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12.	<p>The n^{th} order ordinary linear homogeneous differential equation has</p> <p>(1) n-singular solutions (2) no singular solution</p> <p>(3) one singular solution (4) $(n - 1)$ singular solution</p>

Question No.	Questions
13.	<p>The differential equation $\frac{d^2y}{dx^2} + \frac{dy}{dx} - 2y = 0$ has the solution</p> <p>(1) $y = c_1 e^{-2x} + c_2 e^x$ (2) $y = c e^{-2x}$</p> <p>(3) $y = c_1 e^{-2x} + c_2 e^{-x} + c_3$ (4) $y = c_1 e^{-2x} + c_2 e^{2x}$</p>
14.	<p>The equation $\frac{dy}{dx} + Py = Q$ is linear differential equation of first order if</p> <p>(1) P, Q are functions of x only</p> <p>(2) P, Q are the functions of y only</p> <p>(3) P, Q are the functions of x and y</p> <p>(4) P, Q are the functions of none of x and y</p>
15.	<p>The integrating factor for the differential equation</p> <p>$(x+1) \frac{dy}{dx} - y = e^{3x} (x+1)^2$ is</p> <p>(1) $\frac{1}{x+1}$ (2) $x+1$</p> <p>(3) $\frac{1}{x^2+1}$ (4) x^2-1</p>

Question No.	Questions
16.	<p>The necessary condition for the equation $M(x, y) dx + N(x, y) dy = 0$ to be exact is</p> <p>(1) $\frac{\partial N}{\partial y} = \frac{\partial M}{\partial x}$ (2) $\frac{\partial N}{\partial y} = -\frac{\partial M}{\partial x}$</p> <p>(3) $\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$ (4) $\frac{\partial M}{\partial y} = -\frac{\partial N}{\partial x}$</p>
17.	<p>The differential equation derived from $y = A e^{2x} + B e^{-2x}$; A and B are constants has the order</p> <p>(1) 3 (2) 1</p> <p>(3) 2 (4) 4</p>
18.	<p>The ordinary differential equation $x \frac{dy}{dx} - y = 2x^2$ with initial condition $y(0) = 0$ has</p> <p>(1) No solution (2) A unique solution</p> <p>(3) Two distinct solutions (4) An infinite number of solutions</p>

Question No.	Questions
19.	<p>Which of the following statement is true ?</p> <p>(1) The set Q of rational numbers is neighbourhood of each of its points</p> <p>(2) The set R of real numbers is neighbourhood of each of its points</p> <p>(3) The set N of natural numbers is neighbourhood of each of its points</p> <p>(4) All the above statements are true</p>
20.	<p>If $\lim_{n \rightarrow \infty} a_n^{\frac{1}{n}} = \lim_{n \rightarrow \infty} \frac{a_n + 1}{a_n}$ provided that the limit on RHS exists. This result is known as</p> <p>(1) Heine-Borel theorem (2) Cauchy 2nd theorem on limits</p> <p>(3) Squeeze principle (4) Leibnitz's rule</p>
21.	<p>For a subspace W of a finite dimensional vector space V (F), $\text{Dim} \left(\frac{V}{W} \right)$ is equal to</p> <p>(1) $\text{Dim } V - \text{Dim } W$ (2) $\text{Dim } V$</p> <p>(3) $\text{Dim } W$ (4) $\frac{\text{Dim } V}{\text{Dim } W}$</p>

Question No.	Questions
22.	The set of ordered triplets $(a_1, a_2, 0)$ of \mathbb{R}^3 has dimension (1) 1 (2) 2 (3) 3 (4) 4
23.	A set of vectors containing the null vector is (1) Linearly Independent (2) Linearly Dependent (3) Both (1) and (2) (4) None of these
24.	A bijective linear transformation is called (1) Homomorphism (2) Monomorphism (3) Epimorphism (4) Isomorphism
25.	The matrix $\begin{bmatrix} \cos \alpha & \sin \alpha \\ -\sin \alpha & \cos \alpha \end{bmatrix}$ is (1) Unitary (2) Skew-symmetric (3) Orthogonal (4) Hermitian

Question No.	Questions
26.	<p>The characteristic roots of the matrix $\begin{bmatrix} 2 & \sqrt{2} \\ \sqrt{2} & 1 \end{bmatrix}$ are</p> <p>(1) 2, 1 (2) 0, 3</p> <p>(3) 1, $\sqrt{2}$ (4) 2, $\sqrt{2}$</p>
27.	<p>The set of vectors $X_1 = (2, 1, 4)$, $X_2 = (-3, 2, -1)$, $X_3 = (1, -3, -2)$ is</p> <p>(1) Linearly dependent (2) Linearly Independent</p> <p>(3) Both (1) and (2) (4) None of these</p>
28.	<p>The product of the eigenvalues of the matrix A is equal to</p> <p>(1) A (2) Trace of A</p> <p>(3) 1 (4) 0</p>
29.	<p>If A is a square matrix, then $A + A'$, AA' and $A'A$ are</p> <p>(1) Symmetric (2) Skew symmetric</p> <p>(3) Hermitian (4) Skew Hermitian</p>

Question No.	Questions
30.	<p>If A is an orthogonal matrix, then</p> <p>(1) $A = 0$ (2) $A = \pm 1$ (3) $A = 1$ (4) $A = -1$</p>
31.	<p>When was the first census held in India ?</p> <p>(1) 1870 (2) 1871 (3) 1872 (4) 1874</p>
32.	<p>Which of the following is not a division of NSSO ?</p> <p>(1) Coordination and publication Division (2) Field Data Division (3) Data Processing Division (4) Survey Design and Research Design</p>
33.	<p>The purchasing power of money is</p> <p>(1) Reciprocal of price index number (2) Equal to price index number (3) Twice the price index number (4) Unequal to price index number</p>

Question No.	Questions
34.	<p>Fisher's ideal formula does not satisfy :</p> <p>(1) Time reversal test (2) Circular test</p> <p>(3) Factor reversal test (4) Unit test</p>
35.	<p>Which index number satisfies factor reversal test ?</p> <p>(1) Paasche's Index (2) Laspeyre's Index</p> <p>(3) Fisher's Ideal Index (4) Walsh Price Index</p>
36.	<p>In a chain base method, the base period is</p> <p>(1) Fixed (2) Not fixed</p> <p>(3) Constant (4) Zero</p>
37.	<p>In India, the collection of vital statistics started for first time in</p> <p>(1) 720 (2) 1886</p> <p>(3) 1969 (4) 2014</p>
38.	<p>The death rate obtained for a segment of a population is known as</p> <p>(1) Specific death rate (2) Crude death rate</p> <p>(3) Standardized rate (4) Vital index</p>

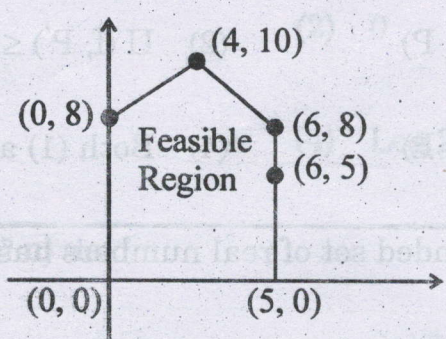
Question No.	Questions
39.	<p>The elasticity for demand of the durable goods is</p> <p>(1) Zero (2) Equal to unity (3) Greater than unity (4) Less than unity</p>
40.	<p>When the price of a product falls by 10% and its demand rises by 30%, then the elasticity of demand is</p> <p>(1) 13 (2) 3 (3) 10 (4) 30</p>
41.	<p>The word 'Statistics' is used as</p> <p>(1) Singular (2) Plural (3) Singular and Plural (4) None of these</p>
42.	<p>In an exclusive type distribution, the limits excluded are :</p> <p>(1) Lower limits (2) Upper limits (3) Either of the lower or upper limits (4) Lower and upper limits both</p>

Question No.	Questions
43.	<p>With the help of the Ogive curve, one can determine :</p> <p>(1) Median (2) Deciles (3) Percentiles (4) All the above</p>
44.	<p>The most appropriate diagram to represent the data relating to the monthly expenditure on different items by a family is :</p> <p>(1) Histogram (2) Pie Chart (3) Frequency Polygon (4) Line graph</p>
45.	<p>The correct relationship between A.M., G.M. and H.M. is :</p> <p>(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) $A.M. \geq G.M. \geq H.M.$</p>
46.	<p>For a group of 100 candidates, the mean was found to be 40. Later on it was discovered that a value 45 was misread as 54. The correct mean is :</p> <p>(1) 40.50 (2) 39.85 (3) 39.80 (4) 39.91</p>

Question No.	Questions
47.	<p>The correct formula for variance of 'n' sample observations x_1, x_2, \dots, x_n is</p> <p>(1) $\frac{1}{n-1} \sum_i (x_i - \bar{x})^2$ (2) $\frac{1}{n-1} \sum_i (x_i^2 - \bar{x}^2)$</p> <p>(3) $\frac{1}{n} \sum_i (x_i - \bar{x})^2$ (4) $\frac{1}{n} \sum_i (x_i^2 - \bar{x}^2)$</p>
48.	<p>Average wages of workers of a factory are Rs. 550 per month and the standard deviation of wages is 110. The coefficient of variation is</p> <p>(1) 30% (2) 15%</p> <p>(3) 500% (4) 20%</p>
49.	<p>In case of positive skewed distribution, the relation between mean, median and mode is :</p> <p>(1) Median > Mean > Mode (2) Mean > Median > Mode</p> <p>(3) Mean = Median = Mode (4) 2 Mean = 1.5 Median = Mode</p>
50.	<p>The idea of product moment correlation was given by :</p> <p>(1) R.A. Fisher (2) Sir Francis Galton</p> <p>(3) Karl Pearson (4) Spearman</p>

Question No.	Questions
51.	<p>$\lim_{n \rightarrow \infty} n^{\frac{1}{n}}$ is equal to</p> <p>(1) 1 (2) 0</p> <p>(3) e (4) Log 2</p>
52.	<p>The set $\{(-1)^n n\}$ is</p> <p>(1) Bounded below but not above</p> <p>(2) Bounded above but not below</p> <p>(3) Bounded</p> <p>(4) Neither bounded below nor bounded above</p>
53.	<p>If $f(x) = \frac{1}{x^2}$ on $[1, 4]$, then the values of L $[f, P]$ and U $[f, P]$ for the partition $P = \{1, 2, 3, 4\}$ of $[1, 4]$ are</p> <p>(1) $\frac{9}{144}, \frac{7}{36}$ (2) $\frac{61}{144}, \frac{49}{36}$</p> <p>(3) $\frac{13}{144}, \frac{9}{36}$ (4) None of these</p>

Question No.	Questions
54.	<p>If $f: [a, b] \rightarrow \mathbb{R}$ is a bounded function and $P, P' \in \mathcal{P}[a, b]$ such that $P \subset P'$, then which of the following is true ?</p> <p>(1) $L(f, P') \geq L(f, P)$ (2) $U(f, P') \leq U(f, P)$</p> <p>(3) $L(f, P') \leq L(f, P)$ (4) Both (1) and (2) are true</p>
55.	<p>Every infinite bounded set of real numbers has a limit point. This result is known as</p> <p>(1) Heine-Borel Theorem (2) Cauchy 1st theorem on limits</p> <p>(3) Cauchy 2nd theorem on limits (4) Bolzano-Weierstrass theorem</p>
56.	<p>The series $\sum_{n=1}^{\infty} \cos\left(\frac{1}{n}\right)$ is</p> <p>(1) Convergent (2) Divergent</p> <p>(3) Oscillating finitely (4) Oscillating infinitely</p>
57.	<p>A set of values of decision variables which satisfies the linear constraints and non-negativity conditions of a LPP is called its</p> <p>(1) Unbounded solution (2) Optimum solution</p> <p>(3) Feasible solution (4) None of these</p>

Question No.	Questions
58.	<p>The feasible region for a LPP is shown shaded in the figure given below. If $Z = 3x - 4y$ be the objective function, then minimum of Z occurs at</p>  <p>(1) $(0, 0)$ (2) $(0, 8)$ (3) $(5, 0)$ (4) $(4, 10)$</p>
59.	<p>A basic solution is called non-degenerate if</p> <p>(1) All the basic variables are zero (2) None of the basic variable is zero (3) At least one of the basic variable is zero (4) Atmost one of the basic variable is zero</p>
60.	<p>Linear Programming Problem (LPP) involving more than two variables can be solved by</p> <p>(1) Graphical method (2) Matrix minima method (3) Hungarian method (4) Simplex method</p>

Question No.	Questions
65.	<p>The mean deviation of the set of numbers 12, 6, 7, 3, 15, 10, 18, 5 is :</p> <p>(1) 3.25 (2) 2.25</p> <p>(3) 4.25 (4) 5.25</p>
66.	<p>If 'X' is a random variable with its mean \bar{X}, then the expression $E(X - \bar{X})^2$ represents</p> <p>(1) The variance of 'X' (2) Second Central moment</p> <p>(3) Both (1) and (2) (4) The standard deviation of 'X'</p>
67.	<p>If 'X' is a random variable having its probability density function (pdf) $f(x)$, then $E\left(\frac{1}{X}\right)$ is called</p> <p>(1) Arithmetic Mean (2) First Quartile</p> <p>(3) Harmonic Mean (4) All of these</p>
68.	<p>The Probability function $f(x)$, $-\infty < x < \infty$ is said to be probability density function if :</p> <p>(1) $\int_{-\infty}^{\infty} f(x) dx - 1 \neq 0$ (2) $\int_{-\infty}^{\infty} f(x) dx = 1$</p> <p>(3) $\int_0^{\infty} f(x) dx = 1$ (4) $\int_{-\infty}^{\infty} f(x) dx = 0$</p>

Question No.	Questions
72.	The moment generating function of Poisson distribution is (1) $e^{\lambda(e^t - 1)}$ (2) $e^{t(e^{\lambda} - 1)}$ (3) $e^t - 1$ (4) $e^{\lambda(1 - e^t)}$
73.	The distribution function of the exponential distribution with parameter ' λ ' is given by (1) $e^{-\lambda x}$ (2) $e^{-\lambda x} - 1$ (3) $1 - e^{-\lambda x}$ (4) $-e^{-\lambda x}$
74.	Which of the following is the mode of the rectangular distribution with parameter A and B ? (1) $\frac{A+B}{2}$ (2) $\frac{A-B}{2}$ (3) Mode does not exist (4) A + B
75.	The Quartile Deviation of the normal distribution is (1) Q.D. = $\frac{1}{2}\sigma$ (2) Q.D. = $\frac{2}{3}\sigma$ (3) Q.D. = $\frac{2}{5}\sigma$ (4) Q.D. = $\frac{3}{4}\sigma$

Question No.	Questions
76.	<p>If A and B are two independent events, then $P(\bar{A} \cap \bar{B})$ is equal to</p> <p>(1) $P(\bar{A}) P(\bar{B})$ (2) $1 - P(A \cup B)$</p> <p>(3) $[1 - P(A)] [1 - P(B)]$ (4) All of these</p>
77.	<p>The moment generating function of the geometric distribution is</p> <p>(1) $\frac{q}{1 - qe^t}$ (2) $\frac{qp}{1 - qe^t}$</p> <p>(3) $\frac{p}{1 - qe^t}$ (4) $\frac{q}{1 - pe^t}$</p>
78.	<p>Which of the following is true ?</p> <p>(1) $E(aX + b) = a E(X)$ (2) $E(aX + bY) = aE(X) + b$</p> <p>(3) $E(aX + bY) = aE(X) + b E(Y)$ (4) All of the above</p>
79.	<p>Two dice are rolled by two players A and B. A throws 10, the probability that B throws more than A is</p> <p>(1) $\frac{1}{12}$ (2) $\frac{1}{6}$</p> <p>(3) $\frac{1}{18}$ (4) $\frac{1}{16}$</p>

Question No.	Questions
80.	<p>The mean of Binomial distribution B (n, p) is</p> <p>(1) np (2) np - 1</p> <p>(3) np + 1 (4) 1 - np</p>
81.	<p>The mathematical expression for continuity of a function is</p> <p>(1) $\lim_{x \rightarrow c} f(x) = f(c), \forall c \in [a, b]$ (2) $\lim_{x \rightarrow c} f(x) = f(c), \forall c \in (a, b)$</p> <p>(3) $\lim_{x \rightarrow c} f(x) = f(c), \forall c \in [a, b]$ (4) $\lim_{x \rightarrow c} f(x) = f(c), \forall c \in (a, b]$</p>
82.	<p>For $2x + 3y = \sin x$, then value of $\frac{dy}{dx}$ is</p> <p>(1) $\frac{\cos x - 2}{3}$ (2) $\frac{\cos x - 2}{2}$</p> <p>(3) $\frac{\tan x - 3}{3}$ (4) $\frac{\sin x - 2}{3}$</p>
83.	<p>If $x = 6 \sin^{-1} 2t$ and $y = \frac{1}{\sqrt{4-t^2}}$, then $\frac{dy}{dx}$ is</p> <p>(1) $\frac{t}{1-4t^2}$ (2) $-\frac{3}{1-4t^2}$</p> <p>(3) $\frac{t}{1-42t^2}$ (4) $\frac{1}{3(1-4t^2)}$</p>

Question No.	Questions
84.	<p>$\lim_{x \rightarrow 0} \left(\frac{a^x + b^x}{2} \right)^{\frac{1}{x}}$ is equals to</p> <p>(1) $a + b$ (2) ab (3) \sqrt{ab} (4) $\frac{1}{2}$</p>
85.	<p>If 'f' be a continuous and differentiable function on (a, b), then the condition for the function 'f' to be increasing is</p> <p>(1) $f'(x) < 0 \quad \forall x_1, x_2 \in (a, b)$ (2) $f'(x) > 0 \quad \forall x_1, x_2 \in (a, b)$ (3) $f'(x) = 0 \quad \forall x_1, x_2 \in (a, b)$ (4) $f'(x) \geq 0 \quad \forall x_1, x_2 \in (a, b)$</p>
86.	<p>The integral $\int_0^{\frac{\pi}{2}} \sin^4 x \cos^2 x \, dx$ is</p> <p>(1) $\frac{\pi}{32}$ (2) $\frac{1}{16}$ (3) $\frac{\pi}{16}$ (4) $\frac{1}{32}$</p>

Question No.	Questions
87.	<p>The name of the property $\int_a^b f(x) dx = \int_b^a f(x) dx$ is</p> <p>(1) Reverse integral property (2) Adding intervals property (3) Zero interval property (4) Adding integrand property</p>
88.	<p>At the point $x = 0$, the function $f(x) = x$, $-1 \leq x \leq 1$ is</p> <p>(1) Continuous and differentiable (2) Non-continuous and differentiable (3) Continuous and non-differentiable (4) Neither continuous nor differentiable</p>
89.	<p>The function $f(x) = \frac{4-x^2}{4x-x^3}$ is</p> <p>(1) Discontinuous at one point (2) Discontinuous at exactly two points (3) Discontinuous at exactly three points (4) Continuous at all points</p>

Question No.	Questions	Question No.
94.	CD-ROM stands for (1) Compactable Read Only Memory (2) Compact Data Read Only Memory (3) Compactable Disk Read Only Memory (4) Compact Disk Read Only Memory	90.
95.	Which of the following is the binary equivalent of the decimal number 35 ? (1) 10001 (2) 100101 (3) 100011 (4) 101001	91.
96.	What is unit of information ? (1) Bit (2) Bite (3) Gram (4) Hertz	92.
97.	Which shortcut key is used, to find a particular word in a word document ? (1) CTRL + S (2) CTRL + F (3) CTRL + R (4) CTRL + Y	93.

Question No.	Questions
98.	<p>VGA is</p> <p>(1) Video Graphics Array (2) Visual Graphics Array</p> <p>(3) Volatile Graphics Array (4) Video Graphics Adapter</p>
99.	<p>What does USB stand for ?</p> <p>(1) Universal Signal Board (2) Universal Signal Bus</p> <p>(3) Universal Serial Bus (4) Universal Serial Board</p>
100.	<p>Which of the following is the correct abbreviation of COMPUTER ?</p> <p>(1) Commonly Occupied Machines used in Technical and Education Research</p> <p>(2) Commonly Operated Machines used in Technical and Environmental Research</p> <p>(3) Commonly Oriented Machines used in Technical and Education Research</p> <p>(4) Commonly Operated Machines used in Technical and Educational Research</p>

SET-“X”

(Total No. of printed pages : 28)

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(PG-EE-2022)

Code **D**

STATISTICS

Sr. No. **10064**

Time : 1¼ Hours

Total Questions : 100

Max. Marks : 100

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

Name : _____ Father's Name : _____

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6. **There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.**
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Question No.	Questions
1.	<p>The mathematical expression for continuity of a function is</p> <p>(1) $\lim_{x \rightarrow c} f(x) = f(c), \forall c \in [a, b]$ (2) $\lim_{x \rightarrow c} f(x) = f(c), \forall c \in (a, b)$</p> <p>(3) $\lim_{x \rightarrow c} f(x) = f(c), \forall c \in [a, b]$ (4) $\lim_{x \rightarrow c} f(x) = f(c), \forall c \in (a, b)$</p>
2.	<p>For $2x + 3y = \sin x$, then value of $\frac{dy}{dx}$ is</p> <p>(1) $\frac{\cos x - 2}{3}$ (2) $\frac{\cos x - 2}{2}$</p> <p>(3) $\frac{\tan x - 3}{3}$ (4) $\frac{\sin x - 2}{3}$</p>
3.	<p>If $x = 6 \sin^{-1} 2t$ and $y = \frac{1}{\sqrt{4-t^2}}$, then $\frac{dy}{dx}$ is</p> <p>(1) $\frac{t}{1-4t^2}$ (2) $\frac{3}{1-4t^2}$</p> <p>(3) $\frac{t}{1-42t^2}$ (4) $\frac{1}{3(1-4t^2)}$</p>

Question No.	Questions
4.	<p>$\lim_{x \rightarrow 0} \left(\frac{a^x + b^x}{2} \right)^{\frac{1}{x}}$ is equals to</p> <p>(1) $a + b$ (2) ab</p> <p>(3) \sqrt{ab} (4) $\frac{1}{2}$</p>
5.	<p>If 'f' be a continuous and differentiable function on (a, b), then the condition for the function 'f' to be increasing is</p> <p>(1) $f'(x) < 0 \quad \forall x_1, x_2 \in (a, b)$</p> <p>(2) $f'(x) > 0 \quad \forall x_1, x_2 \in (a, b)$</p> <p>(3) $f'(x) = 0 \quad \forall x_1, x_2 \in (a, b)$</p> <p>(4) $f'(x) \geq 0 \quad \forall x_1, x_2 \in (a, b)$</p>
6.	<p>The integral $\int_0^{\frac{\pi}{2}} \sin^4 x \cos^2 x \, dx$ is</p> <p>(1) $\frac{\pi}{32}$ (2) $\frac{1}{16}$</p> <p>(3) $\frac{\pi}{16}$ (4) $\frac{1}{32}$</p>

Question No.	Questions
7.	<p>The name of the property $\int_a^b f(x) dx = \int_b^a f(x) dx$ is</p> <p>(1) Reverse integral property (2) Adding intervals property (3) Zero interval property (4) Adding integrand property</p>
8.	<p>At the point $x = 0$, the function $f(x) = x$, $-1 \leq x \leq 1$ is</p> <p>(1) Continuous and differentiable (2) Non-continuous and differentiable (3) Continuous and non-differentiable (4) Neither continuous nor differentiable</p>
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Question No.	Questions
10.	The integral $\int_1^2 \frac{1}{\sqrt{x^2-1}} dx$ converges to (1) 2 (2) 1 (3) 0 (4) 3
11.	When was the first census held in India ? (1) 1870 (2) 1871 (3) 1872 (4) 1874
12.	Which of the following is not a division of NSSO ? (1) Coordination and publication Division (2) Field Data Division (3) Data Processing Division (4) Survey Design and Research Design
13.	The purchasing power of money is (1) Reciprocal of price index number (2) Equal to price index number (3) Twice the price index number (4) Unequal to price index number

Question No.	Questions
14.	<p>Fisher's ideal formula does not satisfy :</p> <p>(1) Time reversal test (2) Circular test</p> <p>(3) Factor reversal test (4) Unit test</p>
15.	<p>Which index number satisfies factor reversal test ?</p> <p>(1) Paasche's Index (2) Laspeyre's Index</p> <p>(3) Fisher's Ideal Index (4) Walsh Price Index</p>
16.	<p>In a chain base method, the base period is</p> <p>(1) Fixed (2) Not fixed</p> <p>(3) Constant (4) Zero</p>
17.	<p>In India, the collection of vital statistics started for first time in</p> <p>(1) 720 (2) 1886</p> <p>(3) 1969 (4) 2014</p>
18.	<p>The death rate obtained for a segment of a population is known as</p> <p>(1) Specific death rate (2) Crude death rate</p> <p>(3) Standardized rate (4) Vital index</p>

Question No.	Questions
19.	<p>The elasticity for demand of the durable goods is</p> <p>(1) Zero (2) Equal to unity (3) Greater than unity (4) Less than unity</p>
20.	<p>When the price of a product falls by 10% and its demand rises by 30%, then the elasticity of demand is</p> <p>(1) 13 (2) 3 (3) 10 (4) 30</p>
21.	<p>Standard error of the sample correlation coefficient 'r' is based on 'n' paired values is :</p> <p>(1) $\frac{1+r^2}{\sqrt{n}}$ (2) $\frac{1+r^2}{n}$ (3) $\frac{1-r^2}{\sqrt{n}}$ (4) $\frac{1+r^2}{\sqrt{n-1}}$</p>
22.	<p>If the value of multiple correlation coefficient is near to 1, it leads to the conclusion that :</p> <p>(1) There is a lack of linear relationship (2) Linear relation is a good fit (3) There is a curvilinear relation (4) All of the above</p>

Question No.	Questions
23.	<p>Regression coefficient is independent of :</p> <p>(1) Origin (2) Scale</p> <p>(3) Both origin and scale (4) Neither origin nor scale</p>
24.	<p>The function $Y = a + bX + cX^2 + dX^3$ represents :</p> <p>(1) A hyperbola (2) An exponential curve</p> <p>(3) A parabola (4) Gompertz curve</p>
25.	<p>The mean deviation of the set of numbers 12, 6, 7, 3, 15, 10, 18, 5 is :</p> <p>(1) 3.25 (2) 2.25</p> <p>(3) 4.25 (4) 5.25</p>
26.	<p>If 'X' is a random variable with its mean \bar{X}, then the expression $E(X - \bar{X})^2$ represents</p> <p>(1) The variance of 'X' (2) Second Central moment</p> <p>(3) Both (1) and (2) (4) The standard deviation of 'X'</p>

Question No.	Questions
27.	<p>If 'X' is a random variable having its probability density function (pdf) $f(x)$, then $E\left(\frac{1}{X}\right)$ is called</p> <p>(1) Arithmetic Mean (2) First Quartile</p> <p>(3) Harmonic Mean (4) All of these</p>
28.	<p>The Probability function $f(x)$, $-\infty < x < \infty$ is said to be probability density function if :</p> <p>(1) $\int_{-\infty}^{\infty} f(x) dx - 1 \neq 0$ (2) $\int_{-\infty}^{\infty} f(x) dx = 1$</p> <p>(3) $\int_0^{\infty} f(x) dx = 1$ (4) $\int_{-\infty}^{\infty} f(x) dx = 0$</p>
29.	<p>Let X be a continuous r.v. with pdf</p> $f(x) = \begin{cases} a_x & ; 0 \leq x \leq 1 \\ a & ; 1 \leq x \leq 2 \\ -ax + 3a & ; 2 \leq x \leq 3 \\ 0 & ; x > 3 \end{cases}$ <p>then the value of 'a' is</p> <p>(1) 0.4 (2) 0.5</p> <p>(3) 0.3 (4) 0.1</p>

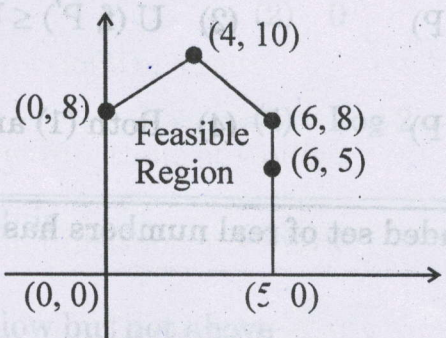
Question No.	Questions								
30.	<p>Let X be a random variable with the following probability distribution :</p> <table border="1" data-bbox="288 506 997 703"> <tr> <td>x</td> <td>-3</td> <td>6</td> <td>9</td> </tr> <tr> <td>P(X=x)</td> <td>$\frac{1}{6}$</td> <td>$\frac{1}{2}$</td> <td>$\frac{1}{3}$</td> </tr> </table> <p>The value of E (X²) is</p> <p>(1) 43.5 (2) 45.37 (3) 46.5 (4) 43.4</p>	x	-3	6	9	P(X=x)	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{3}$
x	-3	6	9						
P(X=x)	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{3}$						
31.	<p>Interpolation provides good estimates of missing values if and only if:</p> <p>(1) The change of values is consistent (2) The series does not refer to abnormal periods (3) The arguments are equidistant (4) All of the above</p>								
32.	<p>The third difference of a cubic Δ³y function are</p> <p>(1) Constant (2) Non constant (3) Variables (4) None of the above</p>								

Question No.	Questions
33.	<p>Who is the father of Computer ?</p> <p>(1) Allan Turing (2) Charles Babbage (3) Simur Cary (4) Augusta Adaming</p>
34.	<p>CD-ROM stands for</p> <p>(1) Compactable Read Only Memory (2) Compact Data Read Only Memory (3) Compactable Disk Read Only Memory (4) Compact Disk Read Only Memory</p>
35.	<p>Which of the following is the binary equivalent of the decimal number 35 ?</p> <p>(1) 10001 (2) 100101 (3) 100011 (4) 101001</p>
36.	<p>What is unit of information ?</p> <p>(1) Bit (2) Bite (3) Gram (4) Hertz</p>

Question No.	Questions	Question No.
37.	Which shortcut key is used, to find a particular word in a word document ? (1) CTRL + S (2) CTRL + F (3) CTRL + R (4) CTRL + Y	
38.	VGA is (1) Video Graphics Array (2) Visual Graphics Array (3) Volatile Graphics Array (4) Video Graphics Adapter	
39.	What does USB stand for ? (1) Universal Signal Board (2) Universal Signal Bus (3) Universal Serial Bus (4) Universal Serial Board	
40.	Which of the following is the correct abbreviation of COMPUTER ? (1) Commonly Occupied Machines used in Technical and Education Research (2) Commonly Operated Machines used in Technical and Environmental Research (3) Commonly Oriented Machines used in Technical and Education Research (4) Commonly Operated Machines used in Technical and Educational Research	

Question No.	Questions	Question No.
41.	$\lim_{n \rightarrow \infty} n^{\frac{1}{n}}$ is equal to (1) 1 (2) 0 (3) e (4) Log 2	37.
42.	The set $\{(-1)^n n\}$ is (1) Bounded below but not above (2) Bounded above but not below (3) Bounded (4) Neither bounded below nor bounded above	38.
43.	If $f(x) = \frac{1}{x^2}$ on $[1, 4]$, then the values of $L[f, P]$ and $U[f, P]$ for the partition $P = \{1, 2, 3, 4\}$ of $[1, 4]$ are (1) $\frac{9}{144}, \frac{7}{36}$ (2) $\frac{61}{144}, \frac{49}{36}$ (3) $\frac{13}{144}, \frac{9}{36}$ (4) None of these	39.

Question No.	Questions
44.	<p>If $f: [a, b] \rightarrow \mathbb{R}$ is a bounded function and $P, P' \in \mathcal{P}[a, b]$ such that $P \subset P'$, then which of the following is true ?</p> <p>(1) $L(f, P') \geq L(f, P)$ (2) $U(f, P') \leq U(f, P)$</p> <p>(3) $L(f, P') \leq L(f, P)$ (4) Both (1) and (2) are true</p>
45.	<p>Every infinite bounded set of real numbers has a limit point. This result is known as</p> <p>(1) Heine-Borel Theorem (2) Cauchy 1st theorem on limits</p> <p>(3) Cauchy 2nd theorem on limits (4) Bolzano-Weierstrass theorem</p>
46.	<p>The series $\sum_{n=1}^{\infty} \cos\left(\frac{1}{n}\right)$ is</p> <p>(1) Convergent (2) Divergent</p> <p>(3) Oscillating finitely (4) Oscillating infinitely</p>
47.	<p>A set of values of decision variables which satisfies the linear constraints and non-negativity conditions of a LPP is called its</p> <p>(1) Unbounded solution (2) Optimum solution</p> <p>(3) Feasible solution (4) None of these</p>

Question No.	Questions
48.	<p>The feasible region for a LPP is shown shaded in the figure given below. If $Z = 3x - 4y$ be the objective function, then minimum of Z occurs at</p>  <p>(1) (0, 0) (2) (0, 8)</p> <p>(3) (5, 0) (4) (4, 10)</p>
49.	<p>A basic solution is called non-degenerate if</p> <p>(1) All the basic variables are zero</p> <p>(2) None of the basic variable is zero</p> <p>(3) At least one of the basic variable is zero</p> <p>(4) Atmost one of the basic variable is zero</p>
50.	<p>Linear Programming Problem (LPP) involving more than two variables can be solved by</p> <p>(1) Graphical method (2) Matrix minima method</p> <p>(3) Hungarian method (4) Simplex method</p>

Question No.	Questions
51.	<p>The order and degree of the differential equation $\frac{d^2y}{dx^2} + \sqrt{1 + \left(\frac{dy}{dx}\right)^3} = 0$ are</p> <p>(1) First order, second degree</p> <p>(2) First order, first degree</p> <p>(3) Second degree, second order</p> <p>(4) Second order, first degree</p>
52.	<p>The n^{th} order ordinary linear homogeneous differential equation has</p> <p>(1) n-singular solutions (2) no singular solution</p> <p>(3) one singular solution (4) $(n - 1)$ singular solution</p>
53.	<p>The differential equation $\frac{d^2y}{dx^2} + \frac{dy}{dx} - 2y = 0$ has the solution</p> <p>(1) $y = c_1 e^{-2x} + c_2 e^x$ (2) $y = c e^{-2x}$</p> <p>(3) $y = c_1 e^{-2x} + c_2 e^{-x} + c_3$ (4) $y = c_1 e^{-2x} + c_2 e^{2x}$</p>

Question No.	Questions
54.	<p>The equation $\frac{dy}{dx} + Py = Q$ is linear differential equation of first order if</p> <p>(1) P, Q are functions of x only</p> <p>(2) P, Q are the functions of y only</p> <p>(3) P, Q are the functions of x and y</p> <p>(4) P, Q are the functions of none of x and y</p>
55.	<p>The integrating factor for the differential equation $(x + 1) \frac{dy}{dx} - y = e^{3x} (x + 1)^2$ is</p> <p>(1) $\frac{1}{x+1}$</p> <p>(2) $x + 1$</p> <p>(3) $\frac{1}{x^2 + 1}$</p> <p>(4) $x^2 - 1$</p>
56.	<p>The necessary condition for the equation $M(x, y) dx + N(x, y) dy = 0$ to be exact is</p> <p>(1) $\frac{\partial N}{\partial y} = \frac{\partial M}{\partial x}$</p> <p>(2) $\frac{\partial N}{\partial y} = -\frac{\partial M}{\partial x}$</p> <p>(3) $\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$</p> <p>(4) $\frac{\partial M}{\partial y} = -\frac{\partial N}{\partial x}$</p>

Question No.	Questions
60.	<p>If $\lim_{n \rightarrow \infty} a_n^{\frac{1}{n}} = \lim_{n \rightarrow \infty} \frac{a_n + 1}{a_n}$ provided that the limit on RHS exists. This result is known as</p> <p>(1) Heine-Borel theorem (2) Cauchy 2nd theorem on limits (3) Squeeze principle (4) Leibnitz's rule</p>
61.	<p>The coefficient of slack variable in the objective function is</p> <p>(1) -M (2) M (3) 0 (4) 1</p>
62.	<p>For maximization LPP, the Simplex method is terminated when all values</p> <p>(1) $C_j - Z_j \geq 0$ (2) $C_j + Z_j \geq 0$ (3) $C_j - Z_j \leq 0$ (4) $C_j + Z_j \leq 0$</p>
63.	<p>The assignment problem is</p> <p>(1) Non-linear programming problem (2) Dynamic programming problem (3) Integer linear programming problem (4) Integer non-linear programming problem</p>

Question No.	Questions
68.	<p>The second approximation to a root of the equation $x^2 - x - 1 = 0$ in the interval (1, 2) by bisection method will be</p> <p>(1) 1.9 (2) 2.35 (3) 1.75 (4) 1.5</p>
69.	<p>The Newton-Raphson method is also called as</p> <p>(1) Tangent method (2) Secant method (3) Chord method (4) Diameter method</p>
70.	<p>Newton's formula for backward differences with usual notations is</p> <p>(1) $y_x = y_0 + \sum_{r=1}^n \binom{u}{r} \Delta^r y_0$ (2) $y_x = y_0 + \sum_{r=1}^{n-1} \binom{u+r}{r} \nabla^r y_r$ (3) $y_x = y_0 + \sum_{r=1}^n \binom{u+r-1}{r} \nabla^r y_0$ (4) None of these</p>
71.	<p>The word 'Statistics' is used as</p> <p>(1) Singular (2) Plural (3) Singular and Plural (4) None of these</p>

Question No.	Questions	Question No.
72.	<p>In an exclusive type distribution, the limits excluded are :</p> <p>(1) Lower limits</p> <p>(2) Upper limits</p> <p>(3) Either of the lower or upper limits</p> <p>(4) Lower and upper limits both</p>	76.
73.	<p>With the help of the Ogive curve, one can determine :</p> <p>(1) Median</p> <p>(2) Deciles</p> <p>(3) Percentiles</p> <p>(4) All the above</p>	77.
74.	<p>The most appropriate diagram to represent the data relating to the monthly expenditure on different items by a family is :</p> <p>(1) Histogram</p> <p>(2) Pie Chart</p> <p>(3) Frequency Polygon</p> <p>(4) Line graph</p>	78.
75.	<p>The correct relationship between A.M., G.M. and H.M. is :</p> <p>(1) $A.M. = G.M. = H.M.$</p> <p>(2) $G.M. \geq A.M. \geq H.M.$</p> <p>(3) $H.M. \geq G.M. \geq A.M.$</p> <p>(4) $A.M. \geq G.M. \geq H.M.$</p>	79.

Question No.	Questions
80.	<p>The idea of product moment correlation was given by :</p> <p>(1) R.A. Fisher (2) Sir Francis Galton</p> <p>(3) Karl Pearson (4) Spearman</p>
81.	<p>For a subspace W of a finite dimensional vector space V (F), $\text{Dim} \left(\frac{V}{W} \right)$ is equal to</p> <p>(1) $\text{Dim } V - \text{Dim } W$ (2) $\text{Dim } V$</p> <p>(3) $\text{Dim } W$ (4) $\frac{\text{Dim } V}{\text{Dim } W}$</p>
82.	<p>The set of ordered triplets $(a_1, a_2, 0)$ of R^3 has dimension</p> <p>(1) 1 (2) 2</p> <p>(3) 3 (4) 4</p>
83.	<p>A set of vectors containing the null vector is</p> <p>(1) Linearly Independent (2) Linearly Dependent</p> <p>(3) Both (1) and (2) (4) None of these</p>

Question No.	Questions
84.	<p>A bijective linear transformation is called</p> <p>(1) Homomorphism (2) Monomorphism</p> <p>(3) Epimorphism (4) Isomorphism</p>
85.	<p>The matrix $\begin{bmatrix} \cos \alpha & \sin \alpha \\ -\sin \alpha & \cos \alpha \end{bmatrix}$ is</p> <p>(1) Unitary (2) Skew-symmetric</p> <p>(3) Orthogonal (4) Hermitian</p>
86.	<p>The characteristic roots of the matrix $\begin{bmatrix} 2 & \sqrt{2} \\ \sqrt{2} & 1 \end{bmatrix}$ are</p> <p>(1) 2, 1 (2) 0, 3</p> <p>(3) 1, $\sqrt{2}$ (4) 2, $\sqrt{2}$</p>
87.	<p>The set of vectors $X_1 = (2, 1, 4)$, $X_2 = (-3, 2, -1)$, $X_3 = (1, -3, -2)$ is</p> <p>(1) Linearly dependent (2) Linearly Independent</p> <p>(3) Both (1) and (2) (4) None of these</p>

Question No.	Questions	Question No.
88.	<p>The product of the eigenvalues of the matrix A is equal to</p> <p>(1) A (2) Trace of A (3) 1 (4) 0</p>	88.
89.	<p>If A is a square matrix, then $A + A'$, AA' and $A'A$ are</p> <p>(1) Symmetric (2) Skew symmetric (3) Hermitian (4) Skew Hermitian</p>	89.
90.	<p>If A is an orthogonal matrix, then</p> <p>(1) $A = 0$ (2) $A = \pm 1$ (3) $A = 1$ (4) $A = -1$</p>	90.
91.	<p>If $X \sim N(\mu, \sigma^2)$, then the standard normal variate is distributed as</p> <p>(1) $N(0, \sigma^2)$ (2) $N(\mu, \sigma^2)$ (3) $N(0, 1)$ (4) $N(\mu, 0)$</p>	91.
92.	<p>The moment generating function of Poisson distribution is</p> <p>(1) $e^{\lambda(e^t - 1)}$ (2) $e^{t(e^\lambda - 1)}$ (3) $e^t - 1$ (4) $e^{\lambda(1 - e^t)}$</p>	92.

Question No.	Questions	Question No.
93.	<p>The distribution function of the exponential distribution with parameter 'λ' is given by</p> <p>(1) $e^{-\lambda x}$ (2) $e^{-\lambda x} - 1$ (3) $1 - e^{-\lambda x}$ (4) $-e^{-\lambda x}$</p>	
94.	<p>Which of the following is the mode of the rectangular distribution with parameter A and B ?</p> <p>(1) $\frac{A+B}{2}$ (2) $\frac{A-B}{2}$ (3) Mode does not exist (4) $A+B$</p>	
95.	<p>The Quartile Deviation of the normal distribution is</p> <p>(1) $Q.D. = \frac{1}{2} \sigma$ (2) $Q.D. = \frac{2}{3} \sigma$ (3) $Q.D. = \frac{2}{5} \sigma$ (4) $Q.D. = \frac{3}{4} \sigma$</p>	
96.	<p>If A and B are two independent events, then $P(\bar{A} \cap \bar{B})$ is equal to</p> <p>(1) $P(\bar{A}) P(\bar{B})$ (2) $1 - P(A \cup B)$ (3) $[1 - P(A)][1 - P(B)]$ (4) All of these</p>	

Question No.	Questions
97.	<p>The moment generating function of the geometric distribution is</p> <p>(1) $\frac{q}{1-qe^t}$ (2) $\frac{qp}{1-qe^t}$</p> <p>(3) $\frac{p}{1-qe^t}$ (4) $\frac{q}{1-pe^t}$</p>
98.	<p>Which of the following is true ?</p> <p>(1) $E(aX + b) = a E(X)$ (2) $E(aX + bY) = aE(X) + b$</p> <p>(3) $E(aX + bY) = aE(X) + b E(Y)$ (4) All of the above</p>
99.	<p>Two dice are rolled by two players A and B. A throws 10, the probability that B throws more than A is</p> <p>(1) $\frac{1}{12}$ (2) $\frac{1}{6}$</p> <p>(3) $\frac{1}{18}$ (4) $\frac{1}{16}$</p>
100.	<p>The mean of Binomial distribution B (n, p) is</p> <p>(1) np (2) np - 1</p> <p>(3) np + 1 (4) 1 - np</p>

ANSWER KEYS OF STATISTICS FOR SESSION 2022-23

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

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ANSWER KEYS OF STATISTICS FOR SESSION 2022-23

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

Polunp
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Madhu
26/8/22

Anuska
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Arora
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