Question Papers

ExamCode: STAT_SI_102014

1. If A and B are mutually exclusive then P(AUB)=

   A. $P(\overline{A})+P(\overline{B})$

   B. $P(A)+P(B)$

   C. $P(A)-P(B)$

   D. None of these

2. **The classical school of thought on probability assumes that all possible outcomes of an experiment are-**

   1) Equally likely
   2) Independent
   3) Mutually exclusive
   4) Equally likely and mutually exclusive

3. If X and Y are random variables, then E(X+Y)=

   A. E(X).E(Y)

   B. E(X)-E(Y)

   C. E(X)+E(Y)

   D. $\frac{E(X)}{E(Y)}$

4. **In a normal distribution the values of mean, median and mode are-**

   1) Equal
   2) Mean>Median>Mode
   3) Mean
   4) Mode>Median

5. If X is a random variable with mean μ then $E[(x-\mu)^r]$ is :

   A. Variance

   B. r^{th} raw moment

   C. r^{th} central moment

   D. Skewness

6. **Data collected on the basis of regions or areas, then it is called-**

1) Geographical classification
2) Chronological classification
3) Qualitative classification
4) Descriptive classification

7. **Classification is the process of arranging data is:**

1) Different columns
2) Different rows
3) Different columns and rows
4) Grouping of related facts in different classes

8. **The value of mode can be determined graphically by-**

1) Ogive curve
2) Frequency polygon
3) Frequency curve
4) Histogram

9. **The coefficient of skewness based on quartiles is:**

1) Karl Pearson co-efficient
2) Bowley's co-efficient
3) Kelly's co-efficient
4) Spearman's Rank correlation

10. **Let A and B in any two groups. If C.V(A) >C.V(B),**

1) A is more variable
2) A is less variable
3) B is more variable
4) None of these

11. **The value of variance is always _____.**

1) Non-negative
2) Negative
3) ∞
4) None of these

12. **Geometric Mean is a good measure of central value, if the data are-**

1) Categorical
2) Nominal
3) Ordinal
4) In ratios or proportions

13. **Skewness means-**

1) Symmetrical
2) Lack of symmetry
3) Balanced
4) Normal

14. **The sum of the deviations about the arithmetic mean is:**

1) Zero
2) Minimum
3) Maximum
4) One

15. Empirical relationship between Mean, Median and Mode is:

A. $\text{Mode} < 3\,\text{Median} - 2\,\text{Mean}$

B. $\text{Mode} > 3\,\text{Median} - 2\,\text{Mean}$

C. $\text{Mode} = 3\,\text{Median} - 2\,\text{Mean}$

D. $\text{Mode} = \dfrac{3\text{Median} - 2\text{Mean}}{2}$

16. Co-efficient of variation is:

A. $C.V = \frac{S.D}{Mean} \times 100$

B. $C.V = \frac{Mean}{S.D} \times 100$

C. $C.V = \frac{Mean \times S.D}{100}$

D. $C.V = \frac{100}{Mean \times S.D}$

17. **The arithmetic mean of series 15, 16, 17, 18, 19, 23 is:**

1) 18 2) 17
3) 16 4) 18.5

18. **The Geometric Mean of the set of values 9, 4 is:**

1) 6 2) 10
3) 25 4) 2

19. **The class interval of the continuous grouped data 10-19 20- 29 30- 39 40- 49 50- 59. The width of interval is:**

1) 9 2) 10
3) 14.5 4) 4.5

20. Geometric mean of two numbers $\frac{1}{16}$ and $\frac{4}{25}$ is:

A. $\frac{1}{10}$

B. $\frac{1}{100}$

C. 10

D. 100

21. In a Binomial Distribution if the mean and variance are 3 and 2, then the distribution function is:

A. $p(X = x) = 9C_x \left(\frac{1}{3}\right)^x \left(\frac{2}{3}\right)^{9-x}, x = 0 \text{ to } 9$

B. $p(X = x) = 9C_x \left(\frac{2}{3}\right)^x \left(\frac{1}{3}\right)^{9-x}, x = 0 \text{ to } 9$

C. $p(X = x) = 9C_x \left(\frac{1}{3}\right)^x \left(\frac{1}{3}\right)^{9-x}, x = 0 \text{ to } 9$

D. None of these

22. Match the following

1) Binomial applies to	a) q / p^2
2) Poisson applies to	b) $\frac{NM(N-M)(N-n)}{N^2(N-1)}$
3) Variance of geometric distribution	c) Repeated two alternatives
4) Variance of Hypergeometrid distribution	d) Rare events

	1	2	3	4
A.	c	d	b	a
B.	c	a	b	d
C.	c	d	a	b
D.	c	b	d	a

23. If the moments $\mu_1 = 1$ and $\mu_2 = 2.5$ then the variance=

A. 1.5

B. 2

C. 1

D. None of these

24. If X is a continuous random variable with mean μ and variance σ^2, they for any positive number k $p[|X - \mu| \geq k\sigma] \leq \frac{1}{k^2}$ is known as-

A. Liapunov's inequality

B. Cramer-Rao inequality

C. Chebychev's inequality

D. Khintchine's inequality

25. If X is a random variable and f(x) is its p.d.f $E\left[\frac{1}{x}\right]$ is used to find.

A. Arithmetic mean

B. Harmonic mean

C. Geometric mean

D. First central moment

26. A random variable with moment generating function $M_x(t) = \left[\frac{2}{3} + \frac{1}{3}e^t\right]$ is distributed with mean and variance is:

A. $\text{mean} = \frac{2}{3}, \text{variance} = \frac{2}{9}$

B. $\text{mean} = \frac{1}{3}, \text{variance} = \frac{2}{9}$

C. $\text{mean} = \frac{1}{3}, \text{variance} = \frac{2}{3}$

D. $\text{mean} = \frac{2}{3}, \text{variance} = \frac{1}{9}$

27. **An integer is chosen at random out of integers from 1 to 100. The probability that it is divisible by 7 is:**

1) 7/100
2) 7/50
3) 1/7
4) 1/14

28. **The probability of a defective bolt is 0.2. The average number of defective bolts in a total of 1000 is:**

1) 100
2) 200
3) 250
4) 20

29. A Random variable X has the following probability function

x	:	−1	0	3	4
p(x):		$\frac{1}{6}$	k	$\frac{1}{4}$	1−6k

where k is a constant, then the value of k is:

A. $\frac{1}{3}$

B. $\frac{2}{9}$

C. $\frac{1}{12}$

D. $\frac{5}{24}$

30. If $\{a_2, a_1, a_2\}$ is a sequence of real numbers then the generating function of the sequence is:

A. $\sum_{i=0}^{\infty} a_i s^i$

B. $\sum_{i=0}^{\infty} a_i s_i$

C. $\sum_{i=0}^{\infty} (as)_i$

D. $\sum_{i=0}^{\infty} (as)^i$

31. **In throwing two coins simultaneously, the expected number of getting heads are-**

1) 3
2) 2
3) 1
4) None of these

32. If $P(A \cup B) = 5/6$, $P(A \cap B) = 1/3$, $P(\overline{B}) = 1/2$ then $P(A) =$

A. $\frac{1}{2}$

B. $\frac{1}{3}$

C. $\frac{2}{3}$

D. None of these

33. Let X be a continuous random variable with probability density function

$f(x) = kx, 0 \le x \le 1$

$= k : 1 \le x \le 2$

$= 0$ otherwise

The value of k is equal to:

A. $\frac{1}{4}$

B. $\frac{2}{3}$

C. $\frac{2}{5}$

D. $\frac{3}{4}$

34. If X is a random variable such that E(X)=3 and variance of X =4, using Chebychev's inequality the lower bound for $P[-2 < x < 8]$ is:

A. $\frac{21}{25}$

B. $\frac{4}{25}$

C. $\frac{25}{4}$

D. $\frac{5}{2}$

35. **The mean of Poisson Distribution is 4, The variance of β_1 and β_2 are-**

1) 4, 0.25, 3.25
2) 2, 0.25, 3.25
3) 4, 4, 3.4
4) 2, 0.5, 3.5

36. **The mean of a Binomial distribution is 20 and the standard deviation is 4. The values of n an p are-**

1) 100, 0.2
2) 25, 0.8
3) 50, 0.4
4) 40, 0.5

37. In the simultaneous tossing of two perfect dice, the probability of obtaining 4 as shown of the resultant faces is:

A. $\frac{4}{12}$

B. $\frac{1}{12}$

C. $\frac{3}{12}$

D. $\frac{2}{12}$

38. **The linear equation of fitting a straight line is :**

1) $y = a + bx$
2) $y = z + bx + cx^2$
3) $y = ab^x$
4) $y = a + x^b$

39. **The limits for the co-efficient of correlation is :**

1) $0 \leq r \leq 1$
2) $-1 \leq r \leq +1$
3) $-1 \leq r \leq 0$
4) $1 \leq r \leq 2$

40. **For fitting $y = a^{bx}$, there are _____ normal equations.**

1) 4
2) 1
3) 3
4) 2

41. **Consider the following: Assertion (A): The coefficient of correlation lies between -1 and +1. Reason (R) : The closer r is to +1 or -1, the closer the relationship between the variables and the closer r is to 0, the less close the relationship.**

1) Both (A) and (R) are true, (R) is correct explanation of (A)
2) (A) is true, R is false
3) (A) is false, R is true
4) Both (A) and (R) is true, R is not the correct explanation of (A)

42. **There will be only one regression line in case of two variables, when-**

1) $r = 0$ only
2) $r = +1$ only
3) $r = -1$ only
4) $r = \pm 1$

43. Match the following

List – I	List - II
a) Scatter Diagram	1) Method of least square
b) Sir Francis Galton	2) Rank correlation
c) Curve fitting	3) Correlation
d) Edward Spearman	4) Regression

	a	b	c	d
A.	3	4	1	2
B.	4	3	2	1
C.	2	4	1	3
D.	1	2	3	4

44. **If r = ±1, the two lines of regressions are-**

1) Coincident
2) Parallel
3) Perpendicular to each other
4) Not parallel

45. **For fitting $y = ax^b$, there are _____ normal equations.**

1) 2
2) 3
3) 1
4) 4

46. **Principle of least squares is used to-**

1) Find correlation
2) Find dispersion
3) Fit an equation
4) Find multiple correlation

47. **When r = ±1, then the angle between the two regression equations is :**

1) $\theta = 0$ or $\pi/2$
2) $\theta = \pi$
3) $\theta = 0$
4) $\theta = 0$ or π

48. For fitting a straight line y=a+bx, the values of a and b when $\Sigma x=0$ are-

A. $a = \Sigma y$ and $b = \frac{\Sigma xy}{\Sigma x}$

B. $a = \frac{\Sigma y}{n}$ and $b = \frac{\Sigma x^2 y}{\Sigma x}$

C. $a = \frac{\Sigma y}{n}$ and $b = \frac{\Sigma xy}{\Sigma x^2}$

D. $a = \frac{\Sigma y}{n}$ and $b = \frac{\Sigma x}{\Sigma x^2}$

49. **If the straight line with 1975 as origin is y=20.6 + 1.68x, the straight line with 1971 as origin is:**

1) Y = 20.6 + 6.72 x
2) Y = 13.88 + 1.68 x
3) Y = 34.61 + 1.68 x
4) Y = 20.81 + 3.46x

50. **If cov(x, y)=2, v(x) = 2 and v(y) = 2, the correlation co-efficient is:**

1) r=-1
2) r=0
3) r=+1
4) r=2

51. For sitting a straight line y=a+bx, the normal equation are 2a+5b=10 and 2a+b=5. The fitted equation is

A. y=7+2.5x

B. $y=\frac{15}{4}+\frac{5}{2}x$

C. $y=\frac{15}{8}+\frac{5}{4}x$

D. y=15+5x

52. In t-distribution the measure of Kurtosis β_2 is equal to

A. $\frac{n-2}{n+4}$

B. 0

C. $3\left(\frac{n-2}{n-4}\right)$

D. 3

53. **All odd order central moments of t-distribution are-**

1) 1
2) Zero
3) 2r
4) 2n-1

54. **Consider the following statements Assertioni (A): Chi-square test (x^2) is a Non-parametric test. Reason (R): x^2 test does not involve any parameter. Select the answer according to the coding given below.**

1) Both (A) & (R) are true but (R) in not the correct explanation of (A).
2) Both (A) & (R) are true and (R) Is the correct explanation of (A).
3) (A) is true, ® is false.
4) (A) is false, ® is true.

55. The co-efficient of skewness in x^2-distribution is

A. $S_k=\frac{2}{n}$

B. $S_k=\frac{2}{\sqrt{n}}$

C. $S_k=\sqrt{\frac{2}{n}}$

D. $S_k=\frac{\sigma}{\sqrt{n}}$

56. The co-efficient of Kurtosis in in x^2-distribution is

A. $\beta_2 = 3$

B. $\beta_2 = \frac{12}{n} + 3$

C. $\beta_2 = \frac{8}{n} + 3$

D. $\beta_2 = \frac{12}{n} - 3$

57. The moment co-efficient of skewness in q x^2-distribution is

A. $\frac{4}{n}$

B. $\frac{2}{n}$

C. $\frac{8}{n}$

D. n

58. The mode of F-distribution is

A. $F = \frac{n_1}{n_2}$

B. $\frac{n_2(n_1 - 2)}{n_1(n_2 + 2)}$

C. $\frac{n_2}{n_1}$

D. $\frac{n_1 - 2}{n_2 + 2}$

59. **The mean of a population is the-**

1) Statistic
2) Parameter
3) Standard error
4) Co-efficient

60. **Normal distribution is meant for-**

1) Large samples
2) Small samples
3) Median
4) Standard deriation

61. **The student 't' distribution was found by-**

1) W.S.Gosset
2) R.A.Fisher
3) Karl pearson
4) Bowley

62. **For testing the significance of the sample mean in small sample we use**

1) F-test
2) Normal test
3) Chi-square test
4) t-test

63. The standard error of the sample mean is given by

A. $\frac{\sigma^2}{n}$

B. $\frac{\sigma}{\sqrt{n}}$

C. $\frac{s^2}{n}$

D. $\frac{(\sigma - s)}{n}$

64. If $Z = \frac{x-\mu}{\sigma} \sim N(0,1)$ then $Z^2 = \left(\frac{x-\mu}{\sigma}\right)^2$ follows

A. F-distribution with n_1, n_2 d.f

B. χ^2-distribution with ld.f

C. Normal distribution

D. t-distribution with n-1 d.f

65. The variance of t-distribution is

A. $\frac{n}{(n-1)}, n>1$

B. n

C. $2n$

D. $\frac{n}{(n-2)}, n>2$

66. **Pictograms are shown by :**

1) Dots
2) Lines
3) Circles
4) Pictures

67. The standard deviationof the normal population is known, and it is σ, the standard error of $\bar{x}$ is-

A. $\frac{\sigma}{\sqrt{n}}$

B. $\frac{\sigma}{\sqrt{n-1}}$

C. $\frac{s}{\sqrt{n-1}}$

D. $\frac{s}{\sqrt{n}}$

68. **If T is an unbiased estimator for θ, then T^2 is a _____ estimator.**

1) Consistent estimator
2) Unbiased estimator
3) Efficient estimator
4) Biased estimator

69. When σ is known and population is normal with large n, the confidence interval for μ is-

A. $\left[\bar{X} \pm \frac{z\alpha}{r_n}\right]$

B. $\left[\bar{X} \pm z\alpha \frac{\sqrt{n}}{\sigma}\right]$

C. $\left[\bar{X} \pm z\alpha \frac{\sigma}{\sqrt{n}}\right]$

D. $\left[\bar{X} \pm \frac{\sigma}{\sqrt{n}}\right]$

70. **If there are K parameters to be estimated in a distribation, then the method of moments involves solving _____ equation.**

1) K-1
2) K+1
3) 2K
4) K

71. **Let $\{T_n\}$ be a sequence of estimators such that for all $\theta \in \Theta$ (i) $E(T_n) \to \theta$ as $n \to \infty$ and (ii) Var $(T_n) \to 0$ as $n \to \infty$ then**

1) T_n is an unbiased estimator of θ
2) T_n is the estimator of θ
3) T_n is a consistent estimator of θ
4) T_n is a sufficient estimator of θ

72. The most general from of the distributions admitting sufficient statistic is given by

A. $L = g(x).\, h(\theta) + \exp[a(\theta).\psi(x)]$

B. $L = g(x).\, h(\theta).\, \psi(\theta, x)$

C. $L = g(x) + h(\theta) \exp[a(\theta).\psi(x)]$

D. $L = g(x).\, h(\theta).\, \exp[a(\theta).\psi(x)]$

73. If T_1 and T_2 are two unbiased estimates of θ having the same variance and ρ is the correlation between them, then

A. $\rho \leq 2e - 1$

B. $\rho \geq 2e - 1$

C. $\rho > 2e - 1$

D. $\rho < 2e - 1$

74. **An unbiased estimator T of θ for which Cramer - Rao lower bound is attained is called a-**

1) Maximum likelihood estimator
2) Minimum variance bound estimator
3) Minimum variance bound estimator
4) Minimum x^2 estimator

75. Let $E(T_1) = \theta = E(T_2)$, where T_1 and T_2 are the linear functions of the sample observations. If $\text{var}(T_1) \leq \text{var}(T_2)$ then,

A. T_1 is an unbiased linear estimator

B. T_1 is the best linear unbiased estimator

C. T_1 is a consistent linear unbiased estimator

D. T_1 is a consistent best linear unbiased estimator

76. Let x_1, x_2, x_3 be a random sample drawn from a normal population with mean μ and $T = \frac{2x_1 + x_2 + \lambda x_3}{3}$ is an unbiased estimator of μ. The $\lambda =$

A. 0
B. 1
C. $\frac{1}{2}$
D. -1

77. **The sample median is a _____ estimator for the mean μ of normal distribution.**

1) Consistent estimator
2) Unbiased estimator
3) Conistent and unbiased estimator
4) Efficient estimator

78. Let $x_1, x_2, \ldots\ldots x_n$ be a random sample drawn on X which takes the values 1 or 0 with respective probabilities θ *and* $1-\theta$ and $T = \sum_{i=1}^{n} x_i$. The $v = \frac{T(T-1)}{n(n-1)}$ is

A. An unbiased estimator of $\theta(\theta-1)$
B. An unbiased estimator of θ^2
C. An unbiased estimator of $\frac{\theta(\theta-1)}{n}$
D. An unbiased estimator of $\frac{\theta(\theta-1)}{n(n-1)}$

79. It $x_1, x_2, \ldots\ldots x_n$ are random observations from x taking the value 1 with probability θ and 0 with probability $1-\theta$ and $\bar{X}$ is the sample mean then $T = \bar{X}(1-\bar{X})$

A. A consistent estimator of θ
B. A consistent estimator of $\theta^2 + 1$
C. A consistent estimator of $1-\theta$
D. A consistent estimator of $\theta(1-\theta)$

80. For a random sample of size n=20, taken a normal $\sum(x-\bar{X})^2 = 380$. The unbiased estimator for σ^2 in

A. 19
B. 20
C. 17.1
D. 21.1

81. **Two samples from two normal populations having equal vaiances of size 10 and 12 have means 12 and 10 and vaiances 2 and 5 respeetively 95% canfidence limits for the difference betwean two population means are [given t 0.05,20=2.086]**

1) [-1.57,5.43]
2) [0.214,3.786]
3) [0.477,3.523]
4) [0.987,0.897]

82. A test of statistical hypothesis where the alternative hypothesis is two tailed such as $H_0: \mu = \mu_0$ vs $H_1: \mu \neq \mu_0$ is known as

A. Two tailed test
B. Left tailed test
C. Right tailed test
D. Equal test

83. **Type-I error occurs when**

1) Rejecting Ho: when it is true
2) Accepting Ho: when it is wrong
3) Rejecting Ho: when it is wrong
4) Accepting Ho: when it is true

84. The test statistic for chi-square test is

A. $\chi^2 = \sum_{i=1}^{n} (Oi + Ei)^2 / Oi$

B. $\chi^2 = \sum_{i=1}^{n} (Oi + Ei)^2 / Ei$

C. $\chi^2 = \sum_{i=1}^{n} (Oi - Ei)^2 / Ei$

D. $\chi^2 = \sum_{i=1}^{n} (Ei - Oi)^2 / Oi$

85. **Equality of several normal populion meany can be testeel by**

1) Bartlett's test
2) Chi - square test
3) t-test
4) F-test

86.

The power of the test is measured by

A. $p(x \in \omega / H_1)$

B. $p(x \in \omega / H_0)$

C. $p(x \in \varpi / H_1)$

D. $p(x \in \varpi / H_0)$

87. **Class frequencies of the type (A),(AB),(ABC) are known as-**

1) Negative frequencies
2) positive frequencies
3) Contrary frequencies
4) Both (A) and (B)

88. For testing the null hypothesis $H_0 : \sigma_1^2 = \sigma_2^2$ of two normal populations, the test statistics-

A. $F = \frac{S_1^2}{S_2^2}$, *where* $S_1^2 < S_2^2$

B. $F = \frac{S_1^2}{S_2^2}$, *where* $S_1^2 > S_2^2$

C. $F = \frac{S_2^2}{S_1^2}$, *where* $S_1^2 > S_2^2$

D. $F = \frac{\sum (x_i - \bar{x})}{\sum (y_i - \bar{y})}$

89. **A test which maximises the power of the test for fixed 'x' is known as-**

1) Optimum test
2) Randomised test
3) Bayes test
4) Likelihood Ratio test

90. **The advantage of function is :**

1) Easy to debug
2) Modularisation
3) Easy to understand
4) All the above

91. **The mean of two single large samples of 1000 and 2000 members are 67.5 inches and 68.0 inches with the population standand deviation 2.5 inches. The value of stabistic Z is-**

1) 4.3
2) 9.2
3) -5.1
4) 4.9

92. Using t-test, to test the two samples drawn from same population (or) two samples have equal means drawn from the population, the test statistics under $H_o: \mu_1 = \mu_2$ is

A. $\frac{\bar{x}_1 - \bar{x}_2}{s\sqrt{\frac{1}{n_1} - \frac{1}{n_2}}}$

B. $\frac{\bar{x}_1 - \bar{x}_2}{s\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$

C. $\frac{\bar{x}_1 - \bar{x}_2}{s\sqrt{\frac{1}{n_1^2} + \frac{1}{n_2^2}}}$

D. $\frac{\bar{x}_1 - \bar{x}_2}{s\sqrt{\frac{1}{2n_1} + \frac{1}{2n_2}}}$

93. **For a givan sample size n, if the level of significance 'x' is decreased, the power of the test will-**

1) Increase
2) Decrease
3) Remain the same
4) None of these

94. The region ω is called UMP critical region of size α for testing $H_0: \theta = \theta_0$ vs $H_1: \theta = \theta_1 \neq \theta_0$ if

A. $P(x \in \omega / H_0) = \alpha$ and $P(x \in \omega / H_0) \geq P(x \in \omega_1 / H_1) \forall \theta \neq \theta_0$

B. $P(x \in \omega / H_0) = \alpha$ and $P(x \in \varpi / H_0) \geq P(x \in \omega_1 / H_1) \forall \theta \neq \theta_0$

C. $P(x \in \omega / H_0) = \alpha$ and $P(x \in \omega / H_1) \geq P(x \in \omega_1 / H_1) \forall \theta \neq \theta_0$

D. $P(x \in \omega / H_0) = \alpha$ and $P(x \in \varpi / H_1) \geq P(x \in \omega_1 / H_1) \forall \theta \neq \theta_0$

95. **Type I error is-**

1) Reject Ho When Ho is true
2) Reject Ho when Ho is not true
3) Accept Ho when Ho is true
4) Accept Ho when Ho is not true

96. What is the formula for the standard error of the difference between proportions $(p_1 - p_2)$ under the alternative hypothesis $H_1: P_1 \neq P_2$

A. $\sqrt{\hat{P}\hat{Q}\frac{1}{n_1} + \frac{1}{n_2}}$

B. $\hat{P}\hat{Q}\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}$

C. $\hat{Q}\hat{Q}\sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$

D. $\sqrt{\frac{P_1 Q_1}{n_1} + \frac{P_2 Q_2}{n_2}}$

97. **CSO is**

1) Central School of Statistics
2) Central Survey Office
3) Central Statistical Office
4) None of these

98. In simple random sampling without replacement $E(s^2)$ is

A. $E(s^2) < s^2$

B. $E(s^2) > s^2$

C. $E(s^2) \neq s^2$

D. $E(s^2) = s^2$

99. In cluster sampling, an unbiased estimate of the population total $\hat{Ye}$ is

A. $\frac{N}{n} \sum_i y_{ij}$

B. $\frac{N}{n} \sum_j y_{ij}$

C. $\frac{n}{N} \sum_i \sum_j yij$

D. $\frac{N}{n} \sum_i \sum_j yij$

100. **If the choice of the sampling unit depends on the discretion of the investigator, then it is called-**

1) Subjective sampling
2) Purpusive sampling
3) Mixec sampling
4) Both (A) and (B)

101. **Greatest drawback of systematic sampling is that-**

1) One Requines a large sample
2) Data are not easily accessible
3) No single reliable formula for standnd error of mean is available
4) None of these

102. Systematic sampling would be more efficient as compared with SRSWOR if

A. $p > -\frac{1}{nk-1}$

B. $p < -\frac{1}{nk-1}$

C. $p \neq -\frac{1}{nk-1}$

D. $p = -\frac{1}{nk-1}$

103. Stratified random sampling is more efficient than simple random sampling if

A. $\frac{v(\bar{y}st)}{v(\bar{y})R} < 1$

B. $\frac{v(\bar{y}st)}{v(\bar{y})R} > 1$

C. $\frac{v(\bar{y}st)}{v(\bar{y})R} = 1$

D. $\frac{v(\bar{y}st)}{v(\bar{y})R} = 0$

104. Sampling error can be reduced by-

1) Choosing a proper probability sampling
2) Selecting a sample of adequate size
3) Using a suitable formula for estimation
4) All of these

105. The organisation that has over all responsibility of assisting the states by developing suitable survey techniques for obtaining timely estimates of crop yield is

1) Survey Design and Research Division
2) Field Operations Division of NSSO
3) Data Processing Division
4) Economic Analysis Division

106. The factor (1-f) is called

1) Finite population correction
2) Fraction defective
3) Sampling fraction defective
4) Percemtage defective

107. In stratified random sampling $v(\bar{y}st)$ *is*

A. $\frac{1}{N^2}\sum_{h=1}^{L} Nh(Nh-nh)\frac{Sh}{nh}$

B. $\frac{1}{N^2}\sum_{h=1}^{L} Nh(Nh-nh)\frac{S^2h}{nh}$

C. $\frac{1}{N^2}\sum_{h=1}^{L} N^2h(Nh-nh)S^2h/nh$

D. $\frac{1}{N}\sum_{h=1}^{L} Nh(Nh-nh)\frac{S^2h}{nh}$

108. In cluster sampling the variance of the estimate is

A. $\frac{N(N-n)}{n(n-1)}\sum_{i=1}^{n}(T_i-\bar{T})^2$

B. $\frac{N(N-n)}{N(N-1)}\sum_{i=1}^{n}(T_i-\bar{T})^2$

C. $\frac{N(N-n)}{n(n-1)}\sum_{i=1}^{n}(T_i-T)^2$

D. $\frac{N(1-n)}{n(n-1)}\sum_{i=1}^{n}(T_i-\bar{T})^2$

109. If $n \to N$ and S_i's equal, then $v(\bar{y}st)_{Ney}$ is

A. > 0

B. < 0

C. 0

D. $\neq 0$

110. The optimum number of strata with C, C_o and C_1 cost ,the overhead cost per stratum and cost per unit respectively is given by

A. $k=\frac{2}{3}\left(\frac{C-Co}{Co}\right)$

B. $k=\frac{2}{3}\left(\frac{Co-C}{C_1}\right)$

C. $k=\frac{3}{2}\left(\frac{C-Co}{C_1}\right)$

D. $k=\frac{2}{3}\left(\frac{C-Co}{C_1}\right)$

111. The 'Ideal Index number' is

1) Marshall- Edgeworth price Index
2) Walsch price Index
3) Kelly's price Index
4) Irving Fisher's Index

112. The period with which the comparisons are made is termed as -

1) Current period
2) Base period
3) Past period
4) None of these

113. Index numbers which are used to measure the changes in the quantity of goods manfactured in a factory are known as-

1) Consumer price index number
2) Quamtity index number
3) Price index number
4) None of these

114. Cost of Living index number is calculated by the formula

A. $\frac{\Sigma p_1 q_0}{\Sigma p_o q_0} \times 100$

B. $\frac{\Sigma pw}{\Sigma w} \times 100$

C. $\frac{\Sigma p_1 q_0}{\Sigma p_o q_0} \times 100$, $\frac{\Sigma pw}{\Sigma w} \times 100$

D. None of these

115. Paache'sprice Index number is calculated by the formula

A. $P_{01} = \frac{\Sigma p_1 q_0}{\Sigma p_o q_0} x100$

B. $P_{01} = \frac{\Sigma p_1 q_1}{\Sigma p_o q_1} x100$

C. $P_{01} = \frac{\Sigma p_0 q_0}{\Sigma p_1 q_1} x100$

D. None of these

116. Laspeyre's index number has

1) Downward bias
2) Upward bias
3) No bias
4) None of these

117. The index number used for the calculation of real wages is

1) Fisher's index number
2) Laspeyre's index number
3) Cost of living index number
4) None of these

118. Change in the composition of commodities in the two periods of comparison gives rise to

1) Formula error
2) Homogeneity Error
3) Sampling error
4) None of these

119. The Index number which provides a better estimate of price changes is

1) Kelly's Index number
2) Laspeyre's Index number
3) Fisher's Index numbers
4) Paache's Index number

120. The following is the most appropriate average in the construction of index numbers.

1) Median
2) Mean
3) Geometric mean
4) Harmonic mean

121. If Laspeyre's price index is 324 and Paasche's index is 144, then Fisher's ideal index is

1) 234
2) 180
3) 216
4) 156

122. In the construction of Index numbers geometric mean gives

1) Equal weights to equal ratios of Changs
2) Unequal weight to equal ratios
3) Equal weights to unequal ratios
4) None of these

123. Making allowance for the effect of changing price levels means

1) Splicing
2) Deflaling
3) Base shifting
4) None of these

124. Match the following

List 1	List2
a) Laspeyre's price index	1)Factor Reversal Test
b) Marshall Edge worth price index	2) Family budget method
c) Fisher's price index	3) Base year quantities
d) Cost of living Index	4) A.M. of base year and current year Quantities

	a	b	c	d
A.	3	1	2	4
B.	3	4	1	2
C.	2	3	4	1
D.	4	3	2	1

125. The Consumer price Index number for 1981 and 1982 to the base 1974 are 320 and 400 respectively. The Consumer price index for 1981 of the base 1982 is-

1) 125
2) 80
3) 128
4) None of these

126. Factor reversal test permits the interchange of

1) Base Peiods
2) Price and Quantity
3) Weights
4) None of these

127. The condition for the time reversal test to hold good with usual notation is

A. $P_{01} \times P_{10} = 1$

B. $P_{10} \times P_{01} = 0$

C. $\frac{P_{01}}{P_{10}} = 1$

D. $P_{01} + P_{10} = 1$

128. An appropriate method for working out cosumer price index is

1) Weighted aggregate expenditure method
2) Family budget method
3) Price relatives method
4) None of these

129. Purchasing power of money is estimated by the formula

A. Price index X 100

B. $\frac{\text{Money income}}{\text{Consumer price index}} \text{ X } 100$

C. $\frac{100}{\text{Price index}}$

D. $\frac{\text{Price index}}{100}$

130. If the Group indices are 80,120,125 and their respective group weights are 60, 20 and 20, the Coonsumer Price Index is :

1) 108.33
2) 97
3) 98.49
4) None of these

131. Listen the following statements (A) and (R). Choose the correct answer for (A): (A): In the field layout, Randomised block Designs is much easy to manage than Latin squore Designs. (R): The former con be used for a field of any shape.

1) (A) & (R) are true and (R) is the correct reason for (A)
2) (A) & (R) are false and (R) is not the correct reason for (A)
3) (A) is true but (R) is wrong
4) (A) is false but (R) is true

132. The term analysis of variance was introduced by

1) Karl Pearson
2) R.A. Fisher
3) C.R.Rao
4) Spearman

133. The reptition of treatments under investigation is known as

1) Replication
2) Randomisation
3) Local Control
4) Treatments

134. ANOVA test is based on the test statistics

1) 't' test
2) x^2-test
3) F-test
4) Z-test

135. Sum of squares between samples is given by

A. $(x_1 + \bar{x})^2 + (x_2 - \bar{x})^2 + \ldots.$

B. $(x_1 + \bar{x})^2 + (x_2 + \bar{x})^2 + \ldots.$

C. $(x_1 - \bar{x})^2 + (x_2 - \bar{x})^2 + \ldots.$

D. $(x_1 - \bar{x})^2 + (x_2 + \bar{x})^2 + \ldots.$

136. The variation between the classes is known as

1) Treatmemts
2) Replication
3) Blocks
4) Errors

137. In completely randomized design, the linear mathematical model will be

A. $y_{ij} = \alpha_i + t_{ij}$

B. $y_{ij} = \mu + \alpha_i$

C. $y_{ij} = \mu + \tau_i$

D. $y_{ij} = \mu + \tau_i + t_{ij}$

138. The validity of statistical analysis and enhancing the precision of the experiments are based on

1) Randomisation
2) Replication
3) Local control
4) All the above

139. Match the following

Column A	Column B
a) Fisher's rule	1) Principles of experimental design
b) Yates method	2) Analysis of variance (ANOVA)
c) Cochran's theorem	3) Missing plot technique
d)Fisher	4) Factorial design

	a	b	c	d
A.	3	4	2	1
B.	2	1	3	4
C.	1	3	4	2
D.	1	2	3	4

140. The formula for estimating one missing value in a Latin square of order K with usual notations

A. $\left(R^1+C^1+T^1-G^1\right)/(K-1)(K-2)$

B. $\left[K\left(R^1+C^1+T^1\right)-2G^1\right]/(K-1)(K-2)$

C. $K\left(R^1+C+T-2G^1\right)/\left(K^2-1\right)$

D. $K\left(R^1+C+T-2G^1\right)/(K-1)^2(K-2)^2$

141. In 4x4 Latin square the total of such possibilities is

1) 8
2) 16
3) 24
4) 576

142. The precision of a design is given by the formula

A. $\frac{1}{v(\bar{x})}$

B. $v(\bar{x})$

C. $\frac{v(\bar{x})}{v(\bar{y})}$

D. $\sqrt{v(\bar{x})}$

143. The correction factor in a two-way ANOVA is

A. $\frac{C^2}{n-1}$

B. G^2/N

C. $G^2 \times N$

D. $G^2 - N$

144. The data are classified according to columns, rows and varieties and are arranged in a square is known as

1) Lotin square
2) Z^2 factorial
3) Completely Ramdomised Design
4) Latin square design

145. If grand total G=25, and N=10, the correction factor in a two way ANOVA is

A. $\frac{10}{625}$

B. $\frac{100}{625}$

C. $\frac{25}{10}$

D. $\frac{625}{10}$

146. np chart is the control chart for

1) Fraction defective
2) Number of defects per unit
3) Number of defectives
4) None of these

147. The probability of accepting a lot with fraction defective is termed as

1) Producer's Risk
2) Consumer's Risk
3) Average outgoing quality limit
4) None of these

148. The lower control limit of C chart is given

A. $\bar{c} + 3\sqrt{\bar{c}}$

B. $\bar{c} - 3\sqrt{\bar{c}}$

C. $\bar{c} - 3\bar{c}$

D. $\bar{c} + 3\bar{c}$

149. The P-Chart is designed to control

1) Proportion of defectives
2) The number of defects per unit
3) The variability of the quality produced
4) None of these

150. If a lot is either accepted or rejected on the basis of two samples combined, it is known as

1) Multiple sampling plan
2) Sequential sampling plan
3) Double sampling plan
4) Single sampling plan

151. R chart reveals any undesirable variation-

1) Between samples
2) Within samples
3) Both
4) None of these

152. A double sampling plan is complete when following are specified.

1) N, n1, c1, n2
2) N, n1, c2, n2
3) N, n1, n2, c1, c2
4) n1, n2, c1, c2

153. Upper control limit for np chart is:

A. $n\bar{p} + 3\sqrt{n\bar{p}\bar{q}}$

B. $n\bar{p} + \sqrt{3n\bar{p}\bar{q}}$

C. $n\bar{p} + 3n\bar{p}\bar{q}$

D. $n\bar{p} - 3\sqrt{n\bar{p}\bar{q}}$

154. A production process is said to be is statistical control, if it is governed by-

1) Chance causes alone
2) Assignable causes alone
3) Chance causes and assignable causes
4) None of these

155. Suggest a chart for controlling the defects.

1) X, R chart
2) np chart
3) p chart
4) c chart

156. Single sample plan is completely specified by-

1) N, n
2) n, c
3) N, c
4) N, n, c

157. If the producer's risk is 5% then the acceptance quality level is:

1) 95%
2) 100%
3) 0.05
4) None of these

158. Which of the following control charts are used for sampling by attributes.

1) X, R chart
2) σ
3) np, p, c chart
4) None of these

159. Preventable variation is the variation due to-

1) Chance causes
2) Assignable causes
3) Both chance causes and assignable cause
4) None of these

160. The periodic up and down movements are called-

1) Seasonal variations
2) Cyclical variations
3) Irregular variations
4) Secular trend

161. The additive model in time series is given by the formula-

1) T x S x C x I
2) T x S + C x I
3) T + S x C + I
4) T + S + C + I

162. The result of natural forces like climate will cause-

1) Cyclical variations
2) Seasonal variations
3) Irregular variations
4) Variance

163. In the equation of the straight line trend the value of 'a' when $\sum x=0$ is given by-

1) Time
2) Rate to change
3) Mean of y-values
4) Data

164. The method of least squares can be used to explain-

1) Linear trend only
2) Non-linear trend only
3) Linear and Non-linear trends
4) None of these

165. The equation of the straight line trend is:

1) $Yc = a+bx$
2) $Yc=a - bx^2$
3) $Yc=a^2 -b^2x^2$
4) $Yc=a^2+bx^2$

166. Centered moving average is calculated in case of the number of years are-

1) Odd
2) Even
3) Odd and Even
4) Calendar year

167. Seasonal index is given by the formula:

A. $\frac{\text{Monthly or Weekly or Quartely or Daily Average}}{\text{General Average}} \times 100$

B. $\frac{\text{General Average}}{\text{Quarterly Average}} \times 100$

C. $\frac{\text{General Average}}{\text{Median}} \times 100$

D. $\frac{\text{General Average}}{\sigma} \times 100$

168. The formula for link relatives is:

A. $\frac{\text{Current month's value}}{\text{Previous month's value}} \times 100$

B. $\frac{\text{Previous month's value}}{\text{Current month's value}} \times 100$

C. $\frac{\text{Previous month's value} + \text{Current month's value}}{100}$

D. $\frac{\text{Current month's value} + \text{Previous month's value}}{2}$

169. In the method of least squares, when $\Sigma x=0$. 'a' is given by the formula.

A. $a = \frac{\Sigma Y}{N}$

B. $a = \frac{\Sigma X}{n}$

C. $a = \frac{\Sigma Y^2}{n}$

D. $a = \frac{\Sigma(X - Y)}{N}$

170. Value of b in the trend line y=a+bx is:

1) Always positive
2) Always negative
3) Both positives and negatives
4) None of these

171. If the trend line with 1975 as origin is y = 20.6 + 1.68x, the trend line with 1971 as origin is:

1) y=20.6 + 6.72x
2) y=13.88 + 1.68x
3) y=34.61 + 1.68x
4) None of these

172. If the origin in a trend equation is shifted forward by three years, x in the equation y=a+bx will be replaced by-

1) x-3
2) x+3
3) 3x
4) None of these

173. An additive model of time series with the components T, S, C and I is:

1) Y = T x S x C x I
2) Y = T + S x C x I
3) Y = T + S + C + I
4) Y = T + S x C + I

174. The consistent increase in production of cereals constitutes the component of a time series.

1) Secular trend
2) Seasonal variation
3) Cyclical variation
4) All of these

175. In assignment problem the number of rows and columns are-

1) Equal
2) No. of rows > No. of columns
3) No. of rows < No. of columns
4) Not equal

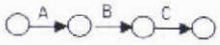
176. An atom is an example of-

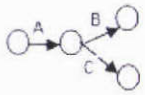
1) Iconic model
2) Analogue model
3) Mathematical model
4) Probabilistic model

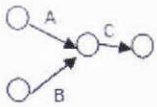
177. In linear programming for charging the '≤' inequalities to equalities introduce:

1) Slack variables
2) Surplus variables
3) Dummy variables
4) None of these

178. The following job sequence is represented by "Jobs B and C preceded by A, B and C should be done at the same time"

A. 

B. 

C. 

D. None of these

179. Slack variable is:

1) Slack = Requirement - Production
2) Slack = Production - Requirement
3) Slack = Requirement + Production
4) None of these

180. All the constraints in standard form of LPP are-

1) Inequalities
2) Equations
3) Both inequalities and equalities
4) None of these

181. The two conditions uses in simplex method are-

1) Non negativity and feasibility
2) Optimality and non negatively
3) Feasibility and optimality
4) None of these

182. An activity in a network-

1) Consumes time and resources
2) Does not consume time
3) Does not consume resources
4) None of these

183. In linear programming the number of choices available to the decision maker.

1) Infinite
2) Zero
3) Finite
4) None of these

184. Optimum solution is a solution that-

1) Maximizes or minimizes the objective function
2) Maximizes the objective function
3) Minimizes the objective function
4) None of these

185. In a linear programming if there are 'm' constraints and n variables then the number of basic solutions.

A. $\frac{(m-n)!}{m!n!}$

B. $\frac{m!n!}{(m+n)!}$

C. $\frac{(m+n)!}{m!n!}$

D. None of these

186. The dual problem of

Max $Z = 4X_1 + 3X_2$, subject to

$3X_1 + X_2 \leq 3$

$4X_1 - 3X_2 \leq 4$, $X, Y \geq 0$,

A. $Minw=3Y_1 + 4Y_2$, S.T $3Y_1 + 4Y_2 \geq 4$, $Y_1 - 3Y_2 \geq 3$, $Y_1, Y_2 \geq 0$

B. $Minw=4Y_1 + 3Y_2$, S.T $3Y_1 + 4Y_2 \geq 4$, $Y_1 - 3Y_2 \geq 3$, $Y_1, Y_2 \geq 0$

C. $Minw=3Y_1 + 4Y_2$, S.T $3Y_1 + 4Y_2 \geq 3$, $Y_1 - 3Y_2 \geq 4$, $Y_1, Y_2 \geq 0$

D. None of these

187. The Right hand side constants b1,b2...bm in the primal problem charged into the cost coefficients in _____ of dual.

1) Objective function
2) Constraints
3) Both objective function and constraints
4) None of these

188. In PERT the expected time is calculated using:

A. $\frac{(t_o + t_p + 4tm)}{4}$

B. $\frac{(t_o + t_p + 4tm)}{6}$

C. $\frac{(t_o + 4tp + t_m)}{6}$

D. $\frac{(4t_o + 4tm + t_p)}{6}$

189. **An assignment problem is a particular case of-**

1) Linear programming problem
2) Inventory problem
3) Transportation problem
4) None of these

190. Crude death rate is given by the formula:

A. $\frac{\text{Annual deaths}}{\text{Annual mean population}} \times 1000$

B. $\frac{\text{Annual mean population}}{\text{Annual deaths}} \times 1000$

C. $\frac{\text{Annual deaths} \times \text{Annual mean population}}{1000}$

D. None of these

191. **Fertility rate is computed as a measure of-**

1) Growth of population
2) Comparison of different populations
3) Estimating the size of population
4) None of these

192. **Crude death rate, standardized death rate, specific death rate are the principal rates used in measuring.**

1) Mortality
2) Fertility
3) Infant mortality
4) None of these

193. **A characteristic associated with arrays is:**

1) DIM statement must be the first program statement
2) A subscripted variable must identify date in the arrays
3) Each array name defines the type of date to be stored within it
4) All of these

194. **Identify the incorrect statement.**

1) 100 GO TO 12
2) 55 GO TO 400
3) 20 GO TO "60"
4) 60 GO TO 660

195. The data used for constructing a life table are-

1) Census data
2) Death registration data
3) Both census and death registration data
4) None of these

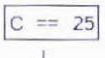
196. Which of the following operates has the highest priority?

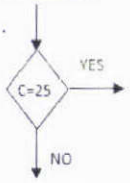
1) *
2) ↑
3) /
4) +

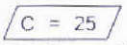
197. The system command used to store a program within the computer is the-

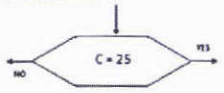
1) SAVE command
2) STORE command
3) HOLD command
4) RESTORE command

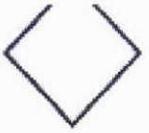
198. Write the equivalent flowchart symbol for the statement if c=25then,

A. 

B. 

C. 

D. 

199. In flowchart,  symbol represents:

A. Branching
B. Decision making
C. Decision making and branching
D. Diversion and branching

200. The order of READ and DATA statements are-

1) READ statement is enough
2) DATA statement is enough
3) Both statements are must in all programs in any order
4) Number of variables in a READ statement, number of values in DATA statement must be equal