

122/2014

- Which of the following statements is **not** correct ?
 (A) The family F consisting of all finite subsets of Ω and their complements always is a σ -field.
 (B) The family F consisting of all countable subsets of Ω and their complements always is a σ -field.
 (C) If F_1 and F_2 are σ -fields on Ω , then $F_1 \cap F_2$ is also a σ -field.
 (D) If F is a σ -field on Ω and $A \subset \Omega$, then $G = \{A \cap B : B \in F\}$ is a σ -field on A .
- Which of the following is a sufficient condition for the real valued function f to be Riemann integrable with respect to α on $[a, b]$?
 (A) f is continuous on $[a, b]$
 (B) f is of bounded variation on $[a, b]$
 (C) f is of bounded variation on $[a, b]$ and α is continuous on $[a, b]$
 (D) α is of bounded variation on $[a, b]$
- Which of the following sequences $\{f_n\}$ is not uniformly convergent on $[0, 1]$?
 (A) $f_n(x) = \frac{x}{1+nx^2}$
 (B) $f_n(x) = \frac{\log(1+n^3x^2)}{n^2}$
 (C) $f_n(x) = x - \frac{x^n}{n}$
 (D) $f_n(x) = nx(1-x^2)^n$
- Let A be a set of rational numbers in $[0, 10]$. Then the Lebesgue measure of A is :
 (A) 10 (B) 0 (C) ∞ (D) None of these
- If $[x]$ denotes the greatest integer function, then the value of the Riemann-Stieltjes integral $\int_0^2 [x] d(x^2)$ is :
 (A) 3 (B) $8/3$ (C) $16/3$ (D) 9
- The following vectors $(1, 9, 9, 8)$, $(2, 0, 0, 8)$, $(2, 0, 0, 3)$ are :
 (A) Linearly dependent (B) Linearly independent
 (C) Identical vectors (D) None of these
- The matrix $\begin{bmatrix} 0 & i \\ -i & 0 \end{bmatrix}$ is a :
 (A) Hermitian matrix (B) Skew Hermitian matrix
 (C) Symmetric matrix (D) Skew symmetric matrix
- If A is a 6×6 matrix of rank 4 then its nullity is :
 (A) 2 (B) 4 (C) 6 (D) 10

9. What type of definiteness does the quadratic form $x^2 + 2y^2 + 3z^2 + 2yz - 2xz + 2xy$ possess ?
 (A) Positive definite (B) Negative definite
 (C) Positive semi-definite (D) Indefinite
10. Identify the **incorrect** statement of the following :
 (A) If A is $m \times n$ matrix of any rank with its g -inverse A^* , then $AA^*A = A$
 (B) The g -inverse A^* exists and $\text{rank}(A^*) \geq \text{rank}(A)$
 (C) If A^* is a g -inverse then A^*A or AA^* is idempotent
 (D) The Moore-Penrose g -inverse is not unique
11. Which of the following doesn't hold true always ?
 (A) $P\left(\bigcap_{i=1}^n A_i\right) \geq 1 - \sum_{i=1}^n P(A_i^c)$
 (B) $P\left(\bigcap_{i=1}^n A_i\right) \geq -(n-1) + \sum_{i=1}^n P(A_i)$
 (C) $P(A \cap B \cap C) = P(A)P(B/A)P(C/A \cap B)$
 (D) $P\left(\bigcup_{i=1}^n A_i\right) \leq 1 - \sum_{i=1}^n P(A_i^c)$
12. If $X > 0$ a.s., then which of the following inequalities is wrong ?
 (A) $E(X^2) \geq (E(X))^2$ (B) $E\left(\frac{1}{X}\right) \geq \frac{1}{E(X)}$
 (C) $E(X^{1/2}) \geq (E(X))^{1/2}$ (D) $E(\log(X)) \leq \log(E(X))$
13. If X is a uniform $[0, 1]$ random variable, then which of the following is a lower bound for $P\left\{\left|X - \frac{1}{2}\right| \leq \frac{1}{4}\right\}$?
 (A) $8/9$ (B) $2/3$ (C) $2/9$ (D) $1/9$
14. Choose the **correct** statement :
 (A) $X_n \xrightarrow{L} X \Rightarrow X_n \xrightarrow{P} X$
 (B) $X_n \xrightarrow{a.s.} X \Rightarrow X_n \xrightarrow{P} X$
 (C) $X_n \xrightarrow{L} X, Y_n \xrightarrow{P} c \Rightarrow X_n + Y_n \xrightarrow{P} X + c$
 (D) $X_n \xrightarrow{P} X \Rightarrow X_n \xrightarrow{m.s.} X$
15. Let $\{X_n\}$ be a sequence of random variables with
 $P(X_n = n) = \frac{1}{n^r}, P(X_n = 0) = 1 - \frac{1}{n^r}, r > 0$. Then,
 (A) $X_n \xrightarrow{P} 0$ (B) $X_n \rightarrow 0$ in r^{th} mean
 (C) X_n converges to 1 in probability (D) None of these

16. If X is a non-negative random variable with distribution function F , then which of the following represents $E(X)$?
- (A) $\int_0^{\infty} xF(x)dx$ (B) $\int_0^{\infty} x(1-F(x))dx$
 (C) $\int_0^{\infty} F(x)dx$ (D) $\int_0^{\infty} (1-F(x))dx$
17. The probability that a contractor will get a plumbing contract is $2/3$ and the probability that he will not get an electric contract is $5/9$. If the probability of getting at least one contract is $4/5$, what is the probability that he will get both contracts ?
- (A) $1/5$ (B) $4/9$ (C) $14/45$ (D) 1
18. Let $\{X_n\}$ be a sequence of i.i.d. random variable with $E(X_n^2) < \infty$. Let $S_n = \sum_{k=1}^n X_k$, $\sigma^2 = \text{Var}(X_n) > 0$ and $Z \sim N(0, 1)$. Then,
- (A) $\frac{S_n - E(S_n)}{n\sigma} \rightarrow Z$ (B) $\frac{S_n - E(S_n)}{n\sigma^2} \rightarrow Z$
 (C) $\frac{S_n - E(S_n)}{\sqrt{n}\sigma^2} \rightarrow Z$ (D) $\frac{S_n - E(S_n)}{\sqrt{n}\sigma} \rightarrow Z$
19. Which type of convergence is used in central limit theorem ?
- (A) Convergence in probability (B) Convergence in r^{th} mean
 (C) Convergence in Law (D) None of these
20. Which of the following is **not** a characteristic function ?
- (A) $e^{-\frac{t^2}{2}}$ (B) $\frac{2}{1 + \cos t}$ (C) $e^{-|t|}$ (D) $(1 - 2it)^{-\frac{1}{2}}$
21. If $P_x(s)$ denote the p.g.f of the random variable X , then the p.g.f of $Y = mX + n$, where m, n are integers ($m \neq 0$) is given by :
- (A) $s^n P_x(s^m)$ (B) $s P_x(s^m)$ (C) $s P_x(s)$ (D) $s^m P_x(s^n)$
22. Let X and Y be independent standard normal random variables. Then the distribution of $Z = \left(\frac{X-Y}{X+Y} \right)^2$ is :
- (A) Chi-square distribution with 2 d.f
 (B) Chi-square distribution with 1 d.f
 (C) F distribution with (2, 2) d.f
 (D) F distribution with (1, 1) d.f

23. The distribution function F of a two - dimensional random variable satisfies, for $(x_1, y_1), (x_2, y_2), x_1 < x_2, y_1 < y_2$ satisfies :
- (A) $F(x_2, y_2) - F(x_2, y_1) + F(x_1, y_1) - F(x_1, y_2) \geq 0$
 (B) $F(x_1, y_1) - F(x_2, y_2) + F(x_2, y_1) + F(x_1, y_2) \geq 0$
 (C) $F(x_2, y_1) + F(x_1, y_2) - F(x_1, y_1) - F(x_2, y_2) \geq 0$
 (D) $F(x_1, y_1) + F(x_2, y_1) + F(x_2, y_2) - F(x_1, y_2) \geq 0$
24. If ρ_{XY} is the correlation between X and Y , then correlation between $U = a + cX$ and $V = b - dY$, ($a, b, c, d > 0$) is :
- (A) ρ_{XY} (B) $-\rho_{XY}$ (C) $\frac{cd}{ab} \rho_{XY}$ (D) $\frac{ab}{cd} \rho_{XY}$
25. In a partially destroyed laboratory record of an analysis of correlation data, only the following regression equations are legible :
- $8x - 10y + 66 = 0$
 $40x - 18y - 214 = 0$
 Then the mean value of Y is :
- (A) 13 (B) 17 (C) 18 (D) 66
26. If $X \sim \text{Poisson}(\lambda_1)$, $Y \sim \text{Poisson}(\lambda_2)$ and X and Y are independent, then the conditional distribution of X given $X + Y$ is :
- (A) Binomial (B) Poisson
 (C) Negative binomial (D) None of these
27. If X and Y are random variables with distribution functions $F(x) = 1 - e^{-x}$ and $G(y) = 1 - e^{-2y}$ respectively, then $E[F(Y) + 2g(X)]$ is :
- (A) 0 (B) 1 (C) $3/2$ (D) ∞
28. The distribution of $X_{(n)} = \text{Max.}(X_1, X_2, \dots, X_n)$, where $X_1, X_2, \dots, X_n$ are i.i.d. $\beta(\alpha, 1)$ is :
- (A) $\beta(\alpha n, 1)$ (B) $\beta(\alpha, 1)$ (C) $\beta(\alpha, n)$ (D) $\beta(\alpha n, n)$
29. If X follows Pareto distribution, then the distribution of $Y = \frac{1}{X}$ is :
- (A) Cauchy (B) Pareto (C) Uniform (D) Weibull
30. If the moment generating function of X is $M(t) = \frac{2}{5}e^t + \frac{1}{5}e^{2t} + \frac{2}{5}e^{3t}$, then its mean and variance are respectively :
- (A) 2 and 0.5 (B) 1 and 0.8 (C) 2 and 0.8 (D) 1 and 0.5

31. Which of the following statements is **not correct** ?
- (A) If a sample of size n is drawn from a population of size N in such a way that every possible sample of size ' n ' has the same chance of being selected, the sample thus obtained is a simple random sample
 - (B) Simple random sample doesn't attempt to reduce the effect of data variation on the error of estimation
 - (C) A stratified random sample is one obtained by separating the population elements into non-overlapping groups and then selecting a simple random sample from each group
 - (D) Stratified random sample always produces an estimator with a smaller variance than that of the corresponding estimator in simple random sampling
32. With regard to ratio estimation based on the response variable y and subsidiary variable x , identify the **correct** statement of the following :
- (A) The use of ratio estimator is most effective when the relationship between y and x is linear through the origin and $\text{Var}(y)$ is proportional to x
 - (B) The correlation ρ between y and x does not affect the precision of the ratio estimator
 - (C) Ratio estimators are always unbiased
 - (D) The ratio estimation is usually superior to regression in estimation if the relationship between the y 's and x 's is a straight line not through the origin
33. A sociologist wants to estimate the average income per adult male in a certain small city where no list of resident adult is available. What would be the logical choice of the survey design in this case ?
- (A) Simple random sampling
 - (B) Systematic sampling
 - (C) Stratified sampling
 - (D) Cluster sampling
34. Which of the following statements is **not correct** ?
- (A) Systematic sampling is easier to perform and is less subject to interviewers errors than simple random sampling
 - (B) Systematic sampling often provides more information per unit cost than simple random sampling
 - (C) When the population size (N) is large and the correlation coefficient (ρ) between pairs of elements within the systematic sampling is closer to one, then the systematic sampling may be better than simple random sampling
 - (D) A systematic sampling is preferable when the population of interest is ordered and population size is large
35. A national survey of University student opinions is conducted by selecting a simple random sample of universities from all those in the country and then selecting a simple random sample of students from each university. What sort of sample survey design is used here ?
- (A) Stratified random sampling
 - (B) A two - stage cluster sampling
 - (C) Cluster sampling
 - (D) None of these
36. In a BIBD, four treatments are arranged in four blocks of three plots each. Each treatment occurs once and only once in three blocks and any two treatments occur together in λ blocks. Then the value of λ is :
- (A) 1
 - (B) 2
 - (C) 3
 - (D) 4

37. Under a 2^4 -factorial design, what interaction is confounded with the following blocks ?
 Block 1 : (1) ad ac ab cd bd bc abcd
 Block 2 : a d c b acd abd abc bcd
 (A) AB (B) AC (C) ABC (D) ABCD
38. Consider the linear model :
 $y_1 = \theta_1 + 2\theta_2 - 2\theta_3 + \epsilon_1$
 $y_2 = \theta_1 + 3\theta_2 - \theta_3 + \epsilon_2$
 $y_3 = \theta_2 + \theta_3 + \epsilon_3$
 Where y_i are observations, θ_i are parameters and ϵ_i are uncorrelated random variables with mean zero and constant variance for $i=1, 2, 3$. Then which of the following is true ?
 (A) $2y_1 - y_2 - y_3$ is an unbiased estimator of $\theta_1 - 4\theta_3$
 (B) $2y_1 - y_2 - y_3$ is the BLUE of $\theta_1 - 4\theta_3$
 (C) $y_2 - 3y_3$ is the BLUE of $\theta_1 - 4\theta_3$
 (D) $y_1 - 4y_3$ is an unbiased estimator of $\theta_1 - 4\theta_3$
39. In the ANOVA for an RBD with 4 blocks and 6 treatments having one missing value which is estimated, the error degrees of freedom is :
 (A) 14 (B) 15 (C) 23 (D) 24
40. For which of the following set of values will a Balanced Incomplete Block Design of parameters (v, b, r, k, λ) exist ?
 (A) $v=11, b=22, r=6, k=3, \lambda=1$ (B) $v=7, b=7, r=4, k=4, \lambda=2$
 (C) $v=21, b=4, r=4, k=21, \lambda=4$ (D) $v=7, b=6, r=3, k=3, \lambda=1$
41. Test statistic for test the significance of difference between variance of two normal populations with known means based on two independent samples of sizes m and n respectively follows :
 (A) an F distribution with $(m-1, n-1)$ d.f.
 (B) a t distribution with $(m+n)$ d.f.
 (C) a t distribution with $(m+n-2)$ d.f.
 (D) an F distribution with (m, n) d.f.
42. If $X_1, X_2, \dots, X_n$ is a random sample from a normal distribution $N(\mu, \sigma^2)$ then the MLE of σ^2 when μ is known is :
 (A) Unbiased and consistent (B) Unbiased but not consistent
 (C) Consistent but not unbiased (D) Neither consistent nor unbiased
43. If $X_1, X_2, \dots, X_n$ is a random sample from a population with density function
 $f(x) = \frac{1}{2}e^{-|x-\theta|}, -\infty < x < \infty$, then the MLE of the parameter θ is :
 (A) Max $(X_1, X_2, \dots, X_n)$ (B) Mean of $X_1, X_2, \dots, X_n$
 (C) Min $(X_1, X_2, \dots, X_n)$ (D) Median of $X_1, X_2, \dots, X_n$
44. A test with size α and power β is said to be an unbiased test if :
 (A) $\alpha \geq \beta$ (B) $\alpha \leq 1-\beta$ (C) $\alpha \leq \beta$ (D) $\alpha \geq 1-\beta$

45. If $X_1, X_2, \dots, X_n$ be a random sample from $N(0, \theta^2)$ then which of the following is true :
- (A) $\sum X_i$ is sufficient for θ
 (B) $\sum X_i^2$ is sufficient for θ
 (C) $(\sum X_i, \sum X_i^2)$ is jointly sufficient for θ
 (D) $(\sum X_i, \sum (X_i - \bar{X})^2)$ is jointly sufficient for θ
46. For an SPRT with strength (α, β) the boundary points A and B satisfy :
- (A) $A \leq \frac{\beta}{1-\alpha}, B \geq \frac{1-\beta}{\alpha}$ (B) $A \leq \frac{1-\beta}{\alpha}, B \geq \frac{\beta}{1-\alpha}$
 (C) $A \leq \frac{\alpha}{1-\beta}, B \geq \frac{\beta}{1-\alpha}$ (D) None of these
47. Based on a single observation X from a normal population with mean μ and variance unity the UMP critical region of size α for test the hypothesis $H_0: \mu \geq 2$ against $H_1: \mu < 2$ when z_α is the α^{th} quantile of a standard normal distribution is :
- (A) $X < z_\alpha - 2$ (B) $X > z_\alpha - 2$ (C) $X < z_\alpha + 2$ (D) $X > z_\alpha + 2$
48. Based on a random sample of size n from $B(1, p)$, the UMVUE of $p(1-p)$ is :
- (A) $\frac{\sum X_i (n - \sum X_i)}{n-1}$ (B) $\frac{\sum X_i (\sum X_i - n)}{n-1}$
 (C) $\frac{\sum X_i (n - \sum X_i)}{n(n-1)}$ (D) $\frac{\sum X_i (\sum X_i - n)}{n(n-1)}$
49. Let T be an ancillary statistic for the parameter θ . Then T and S are independent if :
- (A) S is complete sufficient for θ (B) S is unbiased for θ
 (C) S is sufficient for θ (D) S is consistent for θ
50. If W is the Wilcoxon rank sum statistic and U is the Mann - Whiteny U statistic, then :
- (A) $U = W + \frac{n(n+1)}{2}$ (B) $U = W - \frac{n(n+1)}{2}$
 (C) $W = U + \frac{n(n+1)}{2}$ (D) None of these
51. If X follows $N_p(0, \Sigma)$ then $X'AX$ follows chi-square distribution with r d.f if and only if :
- (A) $A\Sigma$ is of rank r (B) A is of rank r
 (C) $A\Sigma$ is idempotent of rank r (D) A is idempotent of rank r

52. Let R be the sample correlation coefficient of a bivariate sample of size n from a bivariate normal population with correlation coefficient ρ . If $\rho = 0$ then the statistic $R \sqrt{\frac{n-2}{1-R^2}}$ follows a :
- (A) t distribution with $(n-1)$ d.f. (B) t distribution with $(n-2)$ d.f.
 (C) F distribution with $(1, n)$ d.f. (D) F distribution with $(1, n-1)$ d.f.
53. The distribution of Hotelling's T^2 statistic follows :
- (A) Chi-square distribution (B) t distribution
 (C) Wishart distribution (D) F distribution
54. Let $X_1, X_2, \dots, X_n$ ($n > p$) be iid random vectors from $N_p(0, \Sigma)$. Then the distribution of $S = \frac{1}{n} \sum (X_i - \bar{X})(X_i - \bar{X})'$, Where $\bar{X} = \frac{1}{n} \sum x_i$ is :
- (A) $W_p(\Sigma, n-1)$ (B) $W_p\left(\frac{\Sigma}{n}, n\right)$ (C) $W_p\left(\frac{\Sigma}{n}, n-1\right)$ (D) $W_p(\Sigma, n)$
55. If $(X_1, X_2)'$ follows a bivariate normal distribution with dispersion matrix $\begin{pmatrix} 1 & 1/2 \\ 1/2 & 1 \end{pmatrix}$ then the dispersion matrix of $(X_1 + X_2, X_1 - X_2)'$ is :
- (A) $\begin{pmatrix} 3 & 0 \\ 0 & 2 \end{pmatrix}$ (B) $\begin{pmatrix} 3 & 1/2 \\ 1/2 & 1 \end{pmatrix}$ (C) $\begin{pmatrix} 3 & 0 \\ 0 & 1 \end{pmatrix}$ (D) $\begin{pmatrix} 3 & 2 \\ 2 & 1 \end{pmatrix}$
56. If $\{N_t, t \in T\}$ is a Poisson process with rate λ then which of the following is/are correct :
- (a) N_t has independent increment
 (b) $P(N_{t+h} - N_t = 1) = \lambda t + o(h)$
 (c) N_t is a stationary increment process
 (A) a, b and c (B) a and b (C) a and c (D) b and c
57. If $\{X_n, n=0, 1, \dots\}$ is a Galton - Watson branching process with $E(X_1) = m$, then the probability of ultimate extinction is 1 if :
- (A) $m > 1$ (B) $m > 2$ (C) $m \leq 2$ (D) $m \leq 1$
58. Let Y_1, Y_2 and Y_3 be the three principal components of the random vector $X = (X_1, X_2, X_3)$. Which of the following is/are true :
- (a) $V(Y_1) + V(Y_2) + V(Y_3) = V(X_1) + V(X_2) + V(X_3)$
 (b) $V(Y_1) \geq V(Y_2) \geq V(Y_3)$
 (c) Y_1, Y_2 and Y_3 are uncorrelated
 (A) (a) and (c) (B) (b) and (c) (C) (a) and (b) (D) (a), (b) and (c)
59. Which of the following statement(s) is/are true ?
- (a) The state space of a finite Markov chain contain atleast one recurrent state
 (b) In a finite irreducible Markov chain all states are non-null recurrent
 (c) A null recurrent aperiodic state of a Markov chain is called ergodic
 (A) (a) and (b) (B) (a) and (c) (C) (b) and (c) (D) (a), (b) and (c)

60. Let X be a random variable which follows a Poisson distribution with parameter λ and the prior distribution of λ follows $G(\alpha, \beta)$ then the posterior distribution is :
 (A) $G(\alpha + 1, \beta + x)$ (B) $G(\alpha + x, \beta)$ (C) $G(\alpha + x, \beta + 1)$ (D) $G(\alpha, \beta + x)$
61. Under absolute error loss function, the Bayes estimator of a parameter is the :
 (A) Mean of the posterior distribution
 (B) Median of the posterior distribution
 (C) Mode of the posterior distribution
 (D) Mean deviation about mean of the posterior distribution
62. For the linear model $Y = X\beta + \epsilon$, where ϵ is a vector of non-observable random variables with $E(\epsilon) = 0$, then the least square estimate of β is :
 (A) $(X'X)^{-1}Y$ (B) $(X'X)^{-1}X'Y$ (C) $(X'X)X'Y$ (D) $(X'X)X^{-1}Y$
63. The hazard function of Weibull distribution with shape parameter β is monotone increasing when :
 (A) $\beta > 1$ (B) $\beta < 1$ (C) $\beta < 0$ (D) $\beta > 0$
64. Let T be a random variable with hazard function $h(t) = \frac{a}{t}$, $1 < t < \infty$, then the distribution function of T is :
 (A) $\frac{1}{t^a}$ (B) $1 - \frac{1}{t^a}$ (C) $1 - \frac{a}{t^a}$ (D) $\frac{a}{t^a}$
65. If $U_1, U_2, \dots, U_n$ be independent $U(0, 1)$ random variables then $-2 \sum_{i=1}^n \log U_i$ follows a :
 (A) Chi-square distribution with n d.f.
 (B) Gamma $(2n, 1/2)$
 (C) Gamma $(n, 1)$
 (D) Chi-square distribution with $2n$ d.f.
66. If p is the mean percent defective, then the upper control limit for the proportion defective is :
 (A) $p + 3\sqrt{\frac{p(1-p)}{n}}$ (B) $p + \sqrt{\frac{p(1-p)}{6n}}$
 (C) $p + \sqrt{\frac{p(1-p)}{3n}}$ (D) $p + 6\sqrt{\frac{p(1-p)}{n}}$
67. Which distribution is used to find the probability of acceptance for an OC curve ?
 (A) Poisson (B) Normal
 (C) Binomial (D) Negative binomial
68. Which source of variation can be estimated by ratio-to-trend method ?
 (A) Cyclic (B) Trend (C) Irregular (D) Seasonal

69. The Bayesian point estimate is obtained by :
 (A) Minimising the loss (B) Minimising the expected loss
 (C) Minimising the error (D) None of these
70. Let $\{X_n, n \geq 0\}$ be a Markov chain with two states 0 and 1. The one step transition probability matrix is given by $\begin{pmatrix} 1/2 & 1/2 \\ 1/3 & 2/3 \end{pmatrix}$ then the $P(X_{n+2}=1|X_n=0)$ is :
 (A) 7/12 (B) 5/12 (C) 7/18 (D) 11/18
71. A good scientific research is characterized by :
 (A) It requires clear articulation of a goal
 (B) It follows specific plan and procedure
 (C) It accepts certain critical assumptions
 (D) All the above
72. To understand human behavior and reasons over a long period of time one has to do :
 (A) Historical study (B) Quasi experimental study
 (C) Longitudinal study (D) Cross sectional study
73. Teaching and learning arrangements, usually in small groups, that are structured to produce active participation in learning is :
 (A) Symposium (B) Seminar (C) Conference (D) Workshop
74. Directly useful application of scientific principles to production is called :
 (A) Knowledge (B) Science (C) Technology (D) Research
75. Which of the following qualities a researcher must have ?
 (A) Curious about the world (B) Logical and systematic
 (C) Intellectually honest (D) All the above
76. The most effective teaching method that ensures maximum participation of students is :
 (A) Lecture method (B) Text book method
 (C) Discussion method (D) Demonstration method
77. Which of the following is the most important indicator of quality of education in a school ?
 (A) Infrastructural facilities
 (B) Qualification of teachers
 (C) Discipline maintained in the school
 (D) Students' achievements
78. Which of the following is not a quality of effective teacher ?
 (A) Less interaction in the class
 (B) Adopt interactive method of teaching
 (C) Reduce the anxiety level of students
 (D) Motivate the students to take initiative

79. Which of the following can be achieved through value education ?
(A) To inculcate of virtues (B) Develop job skills
(C) Aware on physical fitness (D) Development of personality
80. Teaching method where purposeful activity that will remove a recognized difficulty or perplexity in situation through the process of reasoning is :
(A) Inquiry method (B) Problem solving method
(C) Reflective method (D) None of the above
81. _____ of The Constitution of India directs the State to organize village panchayats and endow them with powers and authority to function as units of self-governments.
(A) Article 39 (B) Article 40 (C) Article 42 (D) Article 46
82. Article _____ of The Constitution of India imposes a duty upon citizens to uphold and protect the sovereignty, unity and integrity of India.
(A) 51-A(b) (B) 51-A(j) (C) 51-A(c) (D) 51-A(f)
83. All-India services can be created by The Parliament as empowered under _____ of The Constitution of India.
(A) Article 312 (B) Article 312-A (C) Article 313 (D) Article 310
84. Freedom as to payment of taxes for promotion of any particular religion is guaranteed under Article _____ of The Constitution of India.
(A) 26 (B) 27 (C) 28 (D) 29
85. In *Sodan Singh v New Delhi Municipality* AIR 1989 SC 1988, The Supreme Court was called upon to decide whether _____.
(A) Municipal authorities can impose restrictions on slaughter houses under Article 19(6)
(B) Employees had a fundamental right to resort to strike without notice
(C) Local authorities can levy a tax retrospectively
(D) Hawkers had a fundamental right to carry on their trade on pavements meant for pedestrians
86. First appeal under Section 19(1) of The Right to Information Act 2005 has to be preferred within _____ days from the expiry of period for receipt of information or from date of decision.
(A) fifteen (B) thirty (C) forty-five (D) sixty
87. As per Section 4(1)(c) of The National Green Tribunal Act 2010, The Tribunal shall consist of a minimum of _____ full-time expert members.
(A) five (B) twenty (C) fifteen (D) ten
88. As per Section 22(1)(b) of The Transplantation of Human Organs Act 1994, no court shall take cognizance of an offence except on complaint filed by a person who has given notice of not less than _____ days to the Appropriate Authority, of the alleged offence and his intention to make the complaint.
(A) thirty (B) sixty (C) ninety (D) fifteen

89. As per Section 10(1) of The Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Act 1989, a special court can pass an externment order against a person likely to commit offence, and direct him not to return to the concerned area for such period not exceeding _____ as may be specified in the order.
(A) six months (B) one year (C) two years (D) five years
90. According to Rule 2(j) of The Noise Pollution (Regulation and control) Rules 2000, 'Night Time' has been defined as the period between _____.
(A) 10 pm and 6 am (B) 10 pm and 5 am
(C) 10 pm and 7 am (D) 9 : 30 pm and 6 : 30 am
91. Who was the founder of 'Sadhu Jana Paripalana Sangham' ?
(A) Sree Narayana Guru (B) Ayyankali
(C) Chattampi Swamikal (D) Sahodaran Ayyappan
92. The social organisation in Kerala, 'Samathwa Samajam' was established in the year :
(A) 1836 (B) 1851 (C) 1855 (D) 1898
93. Which among the following is not written by G. Sankara Kurup ?
(A) Suryakanthi (B) Nimisham
(C) Viswa Darsanam (D) Kunnimanikal
94. Author of the famous book 'Jaathikkummi' :
(A) K.P. Karuppan (B) T.R. Krishnaswami Iyer
(C) P.K. Chattan Master (D) K.P. Vellon
95. The Renaissance leader in Kerala, who got the name 'Kumara Guru' :
(A) Mampuram Thangal (B) Pampadi John Joseph
(C) Poikayil Yohannan (D) Moorkoth Kumaran
96. The name given to the Airforce's rescue operation provided to the flood victims of Uttarakhand :
(A) Operation Surya Hope (B) Operation Rahat
(C) Operation Ganga Prahar (D) Operation Blossom Spring
97. Which year has formally declared by UN General Assembly as 'International year of family farming' ?
(A) 2014 (B) 2010 (C) 2006 (D) 2009
98. The commission appointed for studying the contributory pension system in Kerala :
(A) Ranga Rajan Commission (B) Hazari Commission
(C) Sree Krishna Commission (D) Bhattacharya Commission
99. Which Constitutional Amendment incorporated Panchayati Raj System in our constitution ?
(A) 43rd Amendment (B) 74th Amendment
(C) 73rd Amendment (D) 44th Amendment
100. The nodal agency for estimation of poverty at the national and state level in India :
(A) Rural Ministry (B) Planning Commission
(C) Finance Commission (D) Home Ministry

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