

- 01.** Booklungs are found in :
(1) Amoeba (2) Polystomella
(3) Euglypha (4) Arachnids
- 02.** Silk is obtained from :
(1) Adult moth (2) Caterpillar stage
(3) Egg (4) Cocoon
- 03.** Neurogenic heart is found in :
(1) Human beings (2) Rat
(3) Rabbit (4) Invertebrates
- 04.** Epiphysis is also known as :
(1) Pineal (2) Pituitary
(3) Thyroid (4) Hypothalamus
- 05.** Simplest and smallest form of amino acid is :
(1) Glycine (2) Proline
(3) Lysine (4) Argenine
- 06.** PCOS is related to :
(1) Ovary (2) Uterus
(3) Testes (4) Oviduct
- 07.** Seminogelin is secreted by :
(1) Epididymis (2) Seminal Vesicle
(3) Thecal cells (4) Oviduct
- 08.** First cleavage in frog is :
(1) Horizontal (2) Meridional
(3) Equatorial (4) Latitudinal

09. Which of the following is nuclear receptor ?

- (1) AR (2) GPCR
(3) IR (4) MT1

10. Cryptorchidism is related to :

- (1) Testes (2) Thyroid
(3) Ovary (4) Pancreas

11. In a box containing 10 items ' θ ' are defective. We select a sample of two items and set our hypothesis as $H_0 : \theta = 5$ Vs $H_1 : \theta = 4$. We reject the hypothesis H_0 in favour of H_1 by conducting four different tests given below :

- (A) Find one defective and one good items
(B) Find both defective
(C) Find both good
(D) Find either both good or both defective

out of these four tests, the most powerful test is

- (1) D (2) C
(3) A (4) B

12. Let x_1, x_2, \dots, x_n be a random sample from rectangular distribution over $[0, \theta]$. The uniformly minimum variance unbiased estimator (UMVOE) of θ is :

- (1) \bar{x} (2) $x_{(n)}$
(3) $\left(\frac{n+1}{n}\right)x_{(n)}$ (4) $\left(\frac{n}{n+1}\right)x_{(n)}$

13. Let x_1, x_2, \dots, x_n be a random sample from normal distribution $N(\theta_2, \theta_1)$. Cramer Rao lower bound for the variance of unbiased estimator of θ_1 is :
- (1) $2\theta_1^2/n$ (2) θ_1/n
 (3) $2\theta_1/n$ (4) $2\theta_2^2/n$
14. In Poisson distribution $P(\lambda)$, the m.l.e. of $e^{-\lambda}$ is
- (1) \bar{x} (2) e^{-x}
 (3) e^{-x^2} (4) $e^{-\sum_i x_i^2}$
15. Which of the following statements is correct ?
- (1) For ' θ ' in uniform $U(0, \theta)$, $X_{(n)}$ is sufficient for ' θ '
 (2) $(x_{(1)}, x_{(n)})$ is jointly sufficient for (α, β) in $U(\alpha, \beta)$
 (3) $(\sum_i x_i, \sum_i x_i^2)$ Jointly sufficient for (μ, σ^2) in $N(\mu, \sigma^2)$
 (4) All the above
16. The mean square among elements within a cluster is a function of the size of the cluster given by :
- (1) $S_w^2 = a M$ (2) $S_w^2 = a M^b, (b > 0)$
 (3) $S_w^2 = M$ (4) $S_w^2 = \frac{1}{a} M$
17. Greatest drawback of systematic sampling is that :
- (1) One requires a large sample
 (2) Data is not easily accessible
 (3) Method is complex
 (4) No single reliable formula for standard error of mean is available

18. Hottel - Ross (1954) unbiased ratio-type estimator is given by :

$$(1) \quad t = \bar{r}_n \bar{x}_N + \frac{n(N-1)}{N(n-1)} (\bar{y}_n - \bar{r}_n \bar{x}_n) \quad (2) \quad t = \bar{r}_n \bar{x}_N$$

$$(3) \quad t = \bar{y}_n \bar{r}_n - \bar{x}_n \quad (4) \quad t = \bar{r}_n \bar{x}_N + \frac{\bar{x}_n}{\bar{x}_N}$$

19. The regression estimator reduces to product estimator if :

$$(1) \quad \hat{\beta} = \frac{s_y X}{s^2} \quad (2) \quad \hat{\beta} = \frac{\bar{y}}{\bar{x}}$$

$$(3) \quad \hat{\beta} = -\frac{\bar{y}}{\bar{x}} \quad (4) \quad \hat{\beta} = S^2 / S_{yx}$$

20. A population consisting of the results of the conceptually repeated trials is known as :

- (1) Hypothetical Population (2) Finite population
(3) Infinite population (4) Real population

21. In India, the collections of vital statistics started first times in year :

- (1) 720 A.D. (2) 1886 A.D.
(3) 1969 A.D. (4) 1946 A.D.

22. Death rate of babies under one month is known as :

- (1) Neonatal mortality rate (2) Infant mortality rate
(3) Pre-infant mortalities rate (4) Foetal death rate

23. Net reproduction rate is a measure of :

- (1) Fertility (2) Marital Fertility
(3) Age specific fertility (4) Population growth

24. A population have constant size and composition is called a :
- (1) Stable population (2) Stationary population
 (3) Consistent population (4) All the above
25. The central mortality rate ' m_x ' in terms of ' q_x ' is :
- (1) $m_x = \frac{2q_x}{2+q_x}$ (2) $m_x = \frac{2q_x}{2-q_x}$
 (3) $m_x = \frac{q_x}{2+q_x}$ (4) $m_x = \frac{q_x}{2-q_x}$
26. A Gauss-Markov Linear model has the form :
- (1) $Y = \beta_0 Z_0 + \beta_1 Z_1 + \dots + \beta_k Z_k + \epsilon$
 (2) $Y = \beta_1 Z_1 + \beta_2 Z_2 + \dots + \beta_k Z_k$
 (3) $Y = \beta_0 Z_1 + \beta_1 Z_2 + \dots + \beta_{k+1} Z_k + \epsilon$
 (4) $Y = \beta_1 Z_1 + \beta_2 Z_2^2 + \dots + \beta_k Z_k^k + \epsilon$
27. Consider a linear regression model $y = x\beta + \epsilon$, Where x is a $n \times p$ matrix of rank p , $E(\epsilon) = 0$, $\text{cov}(\epsilon) = \sigma^2 I_n$. Define $n \times n$ matrix $H = ((h_{ij}))$ as $H = x(x'x)^{-1}x'$. Then which of the following are correct ?
- (1) $\epsilon_i = \hat{y}_i - y_i$ then $V(\epsilon_i) = \sigma^2(1-h_{ii})$
 (2) If $h_{ii} = 0$ or 1 for some i then $h_{ij} \neq 0$ for $j \neq i$
 (3) $0 \leq h_{ii} \leq 1, 1 \leq i \leq n$
 (4) None of these

28. A useful method of eliminating fertility variations consist in an experimental layout which will control variation in two perpendicular directions is.
- (1) RBD (2) LSD
(3) BIBD (4) CRD
29. What would be the consequences for the OLS estimator if hetercedasticity is present in a regression model but ignored ?
- (1) It will be biased (2) It will be inconsistent
(3) It will be inefficient (4) All of the above
30. (v, b, r, k, λ) are the standard parameters of a balanced incomplete block design (BIBD). Which of the following can be parameters of a BIBD ?
- (1) $(v, b, r, k, \lambda) = (44, 33, 9, 12, 3)$ (2) $(v, b, r, k, \lambda) = (17, 45, 8, 3, 1)$
(3) $(v, b, r, k, \lambda) = (35, 35, 17, 17, 9)$ (4) $(v, b, r, k, \lambda) = (16, 24, 9, 6, 3)$
31. Characterstic function of multivariate normal distribution $N_p(\mu, \Sigma)$ is :
- (1) $\phi_x(t) = e^{it'\mu} + t'\Sigma t$ (2) $\phi_x(t) = e^{it'\mu} - t'\Sigma t$
(3) $\phi_x(t) = e^{it'\mu} - \frac{1}{2}t'\Sigma t$ (4) $\phi_x(t) = e^{it'\mu} + \frac{1}{2}t'\Sigma t$
32. Let x_1, x_2, \dots, x_n be a ranom sample from multivariate normal distribution $N_p(\mu, \Sigma)$ the distribution of sample mean vector \bar{x} is :
- (1) $N_p\left(\mu, \frac{\Sigma}{\sqrt{N}}\right)$ (2) $N_p\left(\mu, \frac{\Sigma}{N}\right)$
(3) $N_p(\mu, \Sigma)$ (4) Wishart distribution

38. If A and B are any two events of a random experiments. The relation $P(A) \leq P(\bar{B})$ is necessary for which of the following condition :
- (1) $A \supseteq B$ (2) $A \subseteq B$
(3) $A \cup B = \Omega$ (4) $A \cap B = \phi$
39. Events S and T are independent with $P(S) < P(T)$, $P(S \cap T) = \frac{6}{25}$ and $P(S/T) + P(T/S) = 1$. Then the value of $P(S)$ is :
- (1) $\frac{1}{5}$ (2) $\frac{2}{5}$
(3) $\frac{3}{5}$ (4) $\frac{4}{5}$
40. The limit of the sequence of sets $\langle A_n \rangle$, where $A_n = \{x/ 0 < x < 1 - \frac{1}{n}\} \forall n > 1$ is :
- (1) $[0, 1]$ (2) $\{1\}$
(3) $(0, 1)$ (4) None of above