

MODEL QUESTION

Class - XII : Statistics : Time -3h 15m : Marks- 80 : 2020-2021

Group -A : Each Question Carries 1 Mark : 1x20=20

- 1) What is measured by correlation coefficient ?
- 2) What is random variable ?
- 3) Give the interpretation of cov (x,y).
- 4) if $X_{xy}=0$, then X and Y are _____ if X and Y takes two values 0,1 with positive probabilities.
- 5) Give the limits of correlation coefficient.
- 6) if X is a random variable and $f(x)$ is an increasing function, then $f(x)$ is a _____.
- 7) What is sample space ?
- 8) Write the Pmf of poisson distribution.
- 9) Write the number of parameters of a Binomial distribution.
- 10) Who discovered poisson distribution?
- 11) What is rank correlation ?
- 12) Is it true that a correlation coefficient of $\gamma =0.8$ indicate a relationship twice as close as $\gamma=0.4$?
- 13) What is unbiased statistic ?
- 14) if $\gamma =0.5$ then can we say that 50% of the data are explained ?
- 15) What is random experiment ?
- 16) Going to moon and then finding out if there is life. Is it a random experiment ?
- 17) What is the coefficient of rank correlation if ranks of X and Y are the same ?
- 18) Define mutually exclusive events.
- 19) What is the probability of an impossible event ?
- 20) What is the probability of a sure event ?

Group - B : Each Question Carries 2 Marks : 2x5=10

- 21) For any two random variable X and Y. $\text{Cov} (X,Y)=3$, Find the value of $\text{Cov} (5x+4, Y)$
- 22) Write down two characteristics of the Normal distribution.
- 23) If X is a random variable then show that $v(ax+b) = a^2v(x)$
- 24) Find the mean of a poisson distribution with parameter.
25. Show that the degree of linear association between two variables cannot exceed +1.

Group-C : Each Question Carries 3 3x5=15

26. If $v(x)=9$, $v(y) 4$ and $v(x-y)=v(x)$, find the correlation coefficient between x and y.
27. An urn contains 4 tickets numbered 1,2,3,4 and another contains 6 tickets numbered 2,4,6,7,8,9. If one of the two urns is chosen at random and a ticket is drawn at random from the chosen urn find the probabilities that the ticket drawn bears the number 2 or 4.
28. State and prove Bayes theorem.
29. If A and B be two events such that $P(A) = \frac{3}{4}$ and $P(B) = \frac{5}{8}$ show that $\frac{3}{8} \leq P(A \cap B) \leq \frac{5}{8}$.
30. T is an unbiased estimator of θ show that $\sqrt{T}$ is a biased estimator of $\sqrt{\theta}$

Group-D : Each Questions Carries 5 Marks : 5x5=25

31. Show that $\frac{x-2}{(x-1)(x-5)}dx = \frac{1}{4}\log(x-1) + \frac{3}{4}\log(x-5) + c$

32. Obtain the angle between two regression lines.

33. Obtain the median of Normal distribution with parameter μ and σ^2 .

34. For any two events A and B show that

$$P(A \cap B) \leq P(A) \leq P(A \cup B) \leq P(A) + P(B) \quad 2+4$$

35. X_1, X_2 and X_3 are a random sample of size 3 from a population with mean μ and variance σ^2 .

T_1, T_2, T_3 are the three estimators used to estimate mean value μ where,

$$T_1 = x_1 + x_2 - x_3, T_2 = 2x_1 + 3x_3 - 4x_2, T_3 = \frac{1}{3} (\lambda x_1 + x_2 + x_3)$$

i) Are T_1 and T_2 unbiased estimators ?

ii) Find the value of λ such that T_3 is unbiased estimator for μ . 2+3