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KH2R09

8331

STATISTICS

PAPER—A

Maximum Marks—60

Time Allowed—3 Hours

(Long Answer Type Questions)

1. If $f(x) = \begin{cases} 2x, & 0 \leq x \leq 1 \\ \text{Zero,} & \text{otherwise} \end{cases}$, find the probability that :
- (i) $P(1/4 \leq x \leq 1/2)$
(ii) $P(-1/2 < x < 1/2)$.

Or

Define Poission distribution and give three instances where Poission distribution can be employed. Obtain Mean and Variance of the Poission distribution. 5

2. Explain the layout of Latin Square Design. Discuss the applications, advantages and disadvantages of Latin Square Design.

Or

What are the basic principles of Design of Experiment ? Discuss them in detail. 5

3. Using Fisher's Ideal Formula, compute Price and Quantity Index numbers for 1984 with 1982 as base year for the following data :

Year	Commodity (A)		Commodity (B)		Commodity (C)	
	Price (Rs.)	Quantity (kg.)	Price (Rs.)	Quantity (kg.)	Price (Rs.)	Quantity (kg.)
1982	5	10	8	6	6	3
1984	4	12	7	7	5	4

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(2)

Or

Define the terms : Price relatives, Quantity relatives and Value relatives and show how they are related to each other ? 5

4. Tabulate the given data for standardized death-rate by Direct and Indirect methods :

Age in Years	Standard Population		Population A	
	Population in 000's	Sp. Death-rate	Population in 000's	Sp. Death-rate
(0-5)	08	50	12	48
(5-15)	10	15	13	14
(15-50)	27	10	15	09
(50 to Above)	05	60	10	59

Or

What is meant by Fertility of Population ? Explain any three measures of Fertility. 5

5. Consider the given equations as the lines of regression i.e. $4x - 5y + 30 = \text{Zero}$ and $20x - 9y = 107$, which of these is the line of regression of 'x' on 'y' ? Also find r_{xy} and σ_x , when $\sigma_y = 3$.

Or

Prove (i) $r(x, y) = \sqrt{(b_{xy})(b_{yx})}$ and (ii) Compute regression coefficients from the information given $N = 10$, $\sum x = 350$, $\sum y = 210$, $\sum(x - 35)^2 = 162$, $\sum(y - 31)^2 = 222$ and $\sum(x - 35)(y - 31) = 92$. 5

(Short Answer Type Questions)

6. Given mean of Binomial Distribution equal to 2 and the variance equal to $4/3$. Calculate the Probability of getting
- (i) Exactly two successes 3
 - (ii) Less than two successes. 3
7. If the variance of Poisson's Distribution is 2. Find the distribution for $x = 1, 2$ and 3. Given $e^{-2} = 0.1358$. 3
8. Calculate the minimum number of replications so that an observed difference of 10% of the Mean will be taken as significant at 5% level. The C.I. of plot values being 12%. 3

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9. Give the merits of weighted average of relative indices. :
10. What do you understand by the terms specific death-rate and specific birth-rate
Give the formulae of these rates for computation. :
11. Give the use of Vital Statistics in day to day experiences. :
12. Compute \bar{x} , \bar{y} and $r(x, y)$ from the Regression equations, given :
 $8x - 10y + 66 = 0$
 $40x - 18y = 214.$:

(Very Short Answer Type Questions)

13. The following very short answer type questions of two marks, each may be answered in a few sentences or as required.
- (a) Define a Bernoulli variate and hence define Bernoulli distribution. 2
- (b) Briefly give the utility of Consumer Price indices. 2
- (c) What do you understand by the term Measurement of Population ? 2
- (d) Given that : Regression coefficient $b_{xy} = 9/20$, Regression coefficient $b_{yx} = 4/5$
Compute correlation coefficient $r(x, y)$. 2

(Objective Type Questions)

14. Choose the correct/most appropriate answer and write it in your Answer-book :
- (i) For a Poission variate, "X", if $P(x = 2) = 3P(x = 3)$, then the Mean of "X" is
- A. 1
B. 1/2
C. 1/3
D. 1/4. 1
- (ii) If a treatment is repeated "r" times, then the Standard Error (S.E.) of its mean effect is given by
- A. $\frac{\sigma}{\sqrt{r}}$
B. $\frac{\sigma^2}{\sqrt{r}}$
C. $\frac{\sigma}{r}$
D. None of the above. 1

