RAN-2003001104040001

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S.Y.B.Sc. (Sem. IV) Examination April - 2023

Statistical Methods - II (ID)

Time: 2 Hours] **[Total Marks: 50**

સૂચના : / Instructions

(૧) **નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.**
Fill up strictly the details of ☛ signs on your answer book

Name of the Examination:
☛ **S.Y.B.Sc. (Sem. IV)**

Name of the Subject :
☛ **Statistical Methods - II (ID)**

Subject Code No.: **2003001104040001**

Seat No.:

Student's Signature

(2) Figures to the right indicate full marks of questions.

(3) Simple calculator can be used.

Q. 1 **Answer the following questions.** **[10]**

(i) If the probability of a defective tablet is 0.15, find the mean and standard deviation for the distribution of defective tablets in a total of 400 tablets.

(ii) The mortality rate for a certain disease is 9 in 1000. What is the probability for just 2 deaths on account of these diseases in a group of 300?

(iii) If the square of the difference of ranks of two pairs of the observations of x and Y is 33 and correlation coefficient between them is 0.8. then find number of pairs n.

(iv) If Laspeyer's index number =120 and $\sum p_1 q_0 = 168$ then find total expenditure of Base year.

(v) If regression line of variable Y on X is Y = 28 + 1 .2 x. if cov (x,y) = 30 then find standard deviation of x.

Q. 2 (a) Answer any one of the following: **[05]**

(i) Write properties of Poisson distribution and show that mean = variance of it.

(ii) Write properties Binomial distribution and show that mean ≥ variance.

(b) Answer any two of the following: **[10]**

(i) If the probability of a bad reaction from a certain injection is 0.001, determine the chance that out of 2000 individuals more than 2 will get a bad reaction.

(ii) There are 64 beds in a garden and 5 seeds of a particular variety are sown in each bed the probability that a seed will germinate is ¾. find the number of beds in which (i) All seeds have germinated (ii) At least three seeds have germinated.

(iii) If $x \sim N(150,15)$ then find (i) $p(120 < x < 155)$ (ii) $p(x \leq 150)$

Q. 3 (a) Answer any one of the following: **[05]**

(i) Define correlation coefficient. Describe scatter diagram method.

(ii) Distinguish between correlation and regression.

(b) Answer any one of the following: **[07]**

(i) Find Karl-Pearson coefficient of correlation for the following data and comment on the results.

X	2	4	5	6	8	11
Y	18	12	10	8	7	5

(ii) From the following information:

Variable	x	y
Mean	40	30
Standard deviation	5	4

Coefficient of correlation r = 0.8. Estimate Y when X=20.

Q. 4 (a) Answer any one of the following: **[07]**

(i) What is trend? Discuss method of least squares with merits and demerits.

(ii) Write a detail note on cost of living index number.

(b) Answer any one of the following: **[06]**

(i) Given below are the figures of production of a sugar factory in '000 tonnes

year	2015	2016	2017	2018	2019	2020	2021
Production	57	68	74	65	71	78	70

(i) Fit a straight-line trend by method of least squares.

(ii) Calculate trend values.

(iii) Predict the production of factory for 2022 and 2023 on the assumption that the same trend continues.

(ii) From the following data, construct Price index and Quantity index number by Lasperyre's, Paasche'sand Fishers's Method.

Commodity	Base Year		Current Year	
	Price (Rs.)	Quantity (kg.)	Price (Rs.)	Quantity (kg.)
A	4	11	8	12
B	10	7	8	15
C	3	13	9	11
D	13	15	20	18

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