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(iii) Create pair-wise plot.

(iv) Compute mean and variance for X and Z
columns of *Data*. (7,8)

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 5913

H

Unique Paper Code : 2374002005

Name of the Paper : Statistical Computation using R

Name of the Course : **Statistics: Generic Elective
under NEP-UGCF**

Semester : IV

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt 6 questions in all by selecting **three** questions from each section.
3. All questions carry equal marks.

SECTION-A

1. (a) Let $X \sim N(\mu = 100, \sigma = 8)$, then write R-Commands for computing

(i) $P(X < 80)$

(ii) $P(X > 112)$

(iii) $P(88 \leq X \leq 120)$,

- (b) Let $X \sim B(n = 24, p = 0.6)$, then write R-Commands for computing values of a, b and c

(i) $P(a < X < 19) = 0.69$

(ii) $P(1 < X < b) = 0.72$

(iii) $P(X \geq c) = 0.59$ (7,8)

2. (a) Write R-Commands for computing single (left and right both) and two tail probabilities for standard normal and $t_{(28)}$ distributions when $\alpha = 0.01$.

- (iv) Plot y and fitted y each against x on the same plot.

- (b) Write R-code to create a data frame containing X, Y and Z as columns and save it with name *Data*.

X	Y	Z
x_1	y_1	z_1
x_2	y_2	z_2
x_3	y_3	z_3
x_4	y_4	z_4

- (i) Compute the Karl-Pearson's correlation between the columns.

- (ii) Compute the Spearman's correlation between the columns.

(b) For any given vectors x , y , write R commands for the following :

(i) Fit regression line of y on x .

(ii) Extract intercept and slope of regression line.

(iii) Estimate y for any given value of x .

(7,8)

8. (a) Write an R-code for the following :

(i) Fit second degree polynomial curve

$y = \beta_0 + \beta_1 x + \beta_2 x^2$ for the given data

(x, y) .

(ii) Compute fitted y .

(iii) Create a data frame, whose columns are y and fitted y .

(b) Write R-commands to compute single (left and right both) and two tail probabilities for $\chi^2_{(18)}$ and $F(10, 36)$ distributions when $\alpha = 0.05$.

(7,8)

3. (a) Write R program for plotting probability density function and cumulative distribution function of standard normal distribution.

(b) Write R-Commands for finding random sample of size 50 from $N(\mu = 10, \sigma = 12)$ and hence find mean (M) and standard error (S). Also compute $P(M - 3S < X < M + 3S)$ where, $X \sim N(\mu = 10, \sigma = 12)$.

(8,7)

4. (a) Write R program for computing mean, median and mode of data available in format :

$(x_i, f_i), i = 1, 2, \dots, n$.

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- (b) Write R function [Fibonacci(n)] to compute first n terms Fibonacci sequence :

0,1,1,2,3,5,8,13,...

(7.5,7.5)

SECTION-B

5. (a) Write R program for computing a and b in linear Regression line $y = a + b x$ from data available in format (x_i, y_i) , $i = 1, 2, \dots, n$.

- (b) Write the output of the following R commands :

(i) `u<- c(28, 34, 48, 54)`(ii) `v<- seq( 10,70, by=10)`(iii) `w<- cut(u, breaks = v);w` (7,8)

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6. (a) Answer the following :

(i) `seq(from=2, by=0.1, length=5)`(ii) Explain with examples `rbind()` and `cbind()` functions.(iii) Which one of the following is not part of the command `summary(1:7)` :

Minimum, Maximum, Ist Quartile, Mean
Deviation, IIIrd Quartile, Median, Mean?

- (b) Write R- code for creating stem-leaf plot (with example). (9,6)

7. (a) Write R commands for making pie chart of data given below

Car Type	Volvo	Ignis	Volkswagen	Toyota
Sale (%)	15	20	35	30