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# DE-116

**December-2013**

## B.Sc. Sem. V

## STATISTICS – Paper - 305

## (Statistics Using R)

**Time : 3 Hours]** **[Max. Marks : 70**

1. (a) What is R ? Explain in detail.

**OR**

Explain R as a Statistical Software and Language.

(b) Following data are given heights of 45 Female High School Students. Prepare a frequency distribution of the data.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 170 | 151 | 154 | 160 | 158 | 154 | 171 | 156 | 160 |
| 157 | 148 | 165 | 158 | 159 | 155 | 151 | 152 | 161 |
| 156 | 164 | 156 | 163 | 174 | 153 | 170 | 149 | 166 |
| 154 | 166 | 160 | 160 | 161 | 154 | 163 | 164 | 160 |
| 148 | 162 | 167 | 165 | 158 | 158 | 176 | | |

**OR**

The following table gives the no. of students in different faculties of university.

| Year | Arts | Commerce | Science |
|---|---|---|---|
| 1996 | 2810 | 890 | 480 |
| 1997 | 3542 | 1364 | 540 |
| 1998 | 4301 | 2051 | 690 |
| 1999 | 5362 | 949 | 785 |
| 2000 | 6593 | 2071 | 1200 |

(i) Represent the total of students for different year by means of a simple bar diagram.

(ii) Represent the data as a Subdivide bar plot.

2. (a) For n = 10, 20, 50, 99, plot pmf of Binomial distribution for p = 0.3.

**OR**

Obtain Probability distribution of *x*. Where *x* is no. of spots showing when a six-sided symmetric die is rolled. Simulate random samples of sizes 300, and 500.

(b) Draw a random sample of sizes 15 from N(6, 3) distribution. Also find mean.

**OR**

For Poisson variable (X) with Pace meter $\lambda = 0.2$ compute $P(X > 3)$ and $P(X > 8)$.

3. (a) Draw scatter plots of $(x_1, y_1)$ and $(x_2, y_2)$ for the following data :

| $Y_1$ | $X_1$ | $Y_2$ | $X_2$ |
|---|---|---|---|
| 9.50 | 10 | 6.13 | 09 |
| 9.20 | 09 | 9.25 | 13 |
| 6.95 | 5 | 8.25 | 12 |
| 8.49 | 13 | 7.60 | 08 |
| 7.24 | 11 | 5.50 | 10 |
| 5.25 | 12 | 8.74 | 09 |
| 6.08 | 08 | 7.05 | 08 |

**OR**

Compute Spearman's rank correlation coefficient and Pearson's product moment. Correlation coefficient for the following data :

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X | 11.1 | 10.3 | 12.0 | 15.1 | 13.7 | 18.5 | 17.3 | 14.2 |
| Y | 10.9 | 14.2 | 13.8 | 21.5 | 13.2 | 21.1 | 16.4 | 19.3 |

(b) Obtain least square equation of line op Regression of x on y from following data :

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X | 34 | 37 | 36 | 32 | 32 | 36 | 35 | 34 | 29 | 35 |
| Y | 37 | 37 | 34 | 33 | 40 | 39 | 37 | 36 | 34 | 35 |

**OR**

The following data pertain the resistance in (ohms) and the failure times (minutes) of 24 overloaded resistors.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X (Resistance) | 43 | 29 | 44 | 33 | 47 | 34 | 31 | 48 |
| Y (Failure time) | 32 | 20 | 45 | 35 | 22 | 46 | 28 | 26 |

Obtain line of regression of y on *x*.

4. (a) Suppose 3 drying formulas for curing a glue are studied and the following drying times are observed.

| **Sr. No.** | **Formula** | **Obsewations** |
|---|---|---|
| 1 | A | 13 10 8 11 8 |
| 2 | B | 13 14 11 12 13 |
| 3 | C | 4 1 3 4 2 4 |

Carry out parametric analysis of Variances, Assuming equality of variances.

**OR**

(a) Fit Binomial distribution and test goodness of fit for the following data :

| *x* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| f | 2 | 8 | 46 | 116 | 211 | 243 | 208 | 119 | 40 |

(b) Following table shows gain in weight of two lots of Female rats under two diets. Test the hypothesis that the avg. gain in weight for high protein diet is more than that for low protein.

| Sr. No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| High Protein | 134 | 146 | 104 | 119 | 124 | 161 | 107 |
| Low protein | 70 | 118 | 101 | 85 | 107 | 132 | 94 |

**OR**

(b) Fit Poisson distribution and test goodness of fit for the following data :

| *x* | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| f | 6 | 9 | 14 | 10 | 5 | 3 | 1 |

5. Answer the following :

(1) Write three uses of R software.

(2) Explain matrix function with example.

(3) How to store file in R ?

(4) How to import data from Excel in R ?

(5) Explain lists function with example.

(6) 18 19 19 20 21 24 25 find Mean & Median for the given data.

(7) Explain C function with example.

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# DE-116

**December-2013**

## B.Sc. Sem. V Examination

## 305 : Statistics

## Statistical Ecology

## Paper : STA - 305

**Time : 3 Hours]** **[Max. Marks : 70**

**Instructions :** (1) All questions are **compulsory**.

(2) Each question carries **equal** marks.

(3) Statistical tables and graph papers will be provided on request.

(4) Use of Scientific calculator is allowed.

1. (a) Explain logistic growth model, in context to ecology.

**OR**

Give Scope and properties of exponential model.

(b) Define term : Ecology. State different fields where ecology is applied from statistical view point.

**OR**

Explain Gompertz's model. State its uses.

2. (a) Give measures to protect biodiversity.

**OR**

Explain force mortality, stable population and stationary population.

(b) Answer any **one** :

(i) Explain in brief : Life table.

(ii) Write a note on Leslie Matrix.

**OR**

Give brief details on biodiversity and its role in ecology.

3. (a) State probability density function of log normal distribution. How it differs from Normal distribution ?

**OR**

State the probability mass function of Geometric Distribution. State applications of Geometric distribution to ecology.

(b) Explain in detail : Poisson Forest, Regular Spatial Pattern.

**OR**

Explain the procedure of calculating Simpson's index.

4. (a) State the different terms used in life table. Give their interrelationship.

**OR**

Explain exponential model. Give its applications in ecology.

(b) Explain the procedure of calculating Shannon's index.

**OR**

State different capture recapture models in the literature of Statistical Ecology and explain any one of them.

5. Answer the following :

(a) Give two names of smoothing process.

(b) How will you interpret the liner growth model ?

(c) Define closed population.

(d) Give two limitations of exponential distribution.

(e) State scope and limitations of Gompertz's model.

(f) State the names to derive (i) estimator of recapture and multiple recaptures, (ii) estimator of population size.

(g) Give use of log normal distribution.

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