CHRIST UNIVERSITY, BANGALORE-560029

End Semester Examination Sept / Oct - 2014
I Sem - BSc in CMS / EMS

Code : STA131 **Max. Marks : 100**
Sub : DESCRIPTIVE STATISTICS AND PROBABILITY THEORY **Duration : 3Hrs**

General Instructions : Question numbers and notations must be clearly written. Scientific calculators allowed

SECTION A

Answer any TEN questions **10 X 2 = 20**

1 Give an example each for

(i) nominal scale

(ii) interval scale.

2 Define captions and stubs.

3 List any two mathematical averages.

4 The mean weight of 150 students is 60 kgs. The mean weight of boys in the class is 70kgs and that of the girls is 55 kgs. Find the number of boys and girls.

5 Why do we consider the absolute deviations while calculating the mean deviation?

6 Define correlation ratio.

7 Define intra class correlation.

8 What will be the correlation coefficient when variables are varying:

(i) in the same direction?

(ii) independent?

9 Define partial correlation coefficient.

10 In a trivariate distribution, $\sigma_1=2$, $\sigma_2= \sigma_3 =3$, $r_{12} = 0.7$, $r_{23} = r_{31} = 0.5$, find $R^2_{1.23}$.

11 Given P (A) = ¾, find P (A^c). Which formula is used to find this?

12 Define 'complementary events'.

SECTION B

Answer any FOUR questions **4 X 6 = 24**

13 The daily high and low temperatures for 20 cities follow:

City	High	Low	City	High	Low
Athens	75	54	Melbourne	66	50
Bangkok	92	74	Montreal	64	52
Cairo	84	57	Paris	77	55
Copenhagen	64	39	Rio de Janeiro	80	61
Dublin	64	46	Rome	81	54
Havana	86	68	Seoul	64	50
Hong Kong	81	72	Singapore	90	75
Johannesburg	61	50	Sydney	68	55
London	73	48	Tokyo	79	59
Manila	93	75	Vancouver	57	43

(a) Prepare a stem and leaf display for the high temperatures and low temperatures. (b) Compare the stem and leaf displays from part (a) and make some comments about the difference daily high and low temperatures.

14 Define harmonic mean. When do we use it? Obtain the expression for combined harmonic mean of 2 sets of observations.

15 Write short notes on skewnessand kurtosis.

16 Derive the line of regression of X on Y.

17 Also show that $1-R^2_{1.23}=(1-r^2_{12})(1-r^2_{13.2})$. Also show that $R_{1.23} \geq r_{12}$.

18 a) In a city 60% read news paper A, 40% read news paper B and 30% read news paper C, 20% read A and B, 30% read A and C, 10% read B and C. Also 15 % read papers A, B and C. Find the percentage of people who do not read any of theses news papers.

b) Explain the concept used in (a).

SECTION C

Answer any FOUR questions **4 X 14 = 56**

19 a) Explain the procedure of framing a schedule.

b) Describe the construction of histogram and locating mode from that.

20 a) Explain the procedure of construction of a table.

b) Draw up a blank table to show the number of employees in a large commercial firm, classified according to (*i*) Sex: Male and Female; (*ii*) Three age-groups: below 30, 30 and above but below 45, 45 and above; and (*iii*) Four income-groups: below Rs. 400, Rs. 400–750, Rs. 750–1,000, above Rs.1000.

21 Express raw moments in terms of central moments and vice versa. What is the role of moments in studying the nature of a given frequency distribution?

22 a) Show that the sum of squared deviations is minimum when taken about mean.

b) Distinguish between absolute and relative measures of dispersion. Discuss various measures of absolute and relative measures of dispersion.

23 a) State and prove the properties of regression coefficients.

b) Write a short note on coefficient of determination.

24 a) In an office there are 70 people, of whom 40 are women. Among the women, 25 are graduates, and among men, 15 are graduates. A person is chosen at random What is the probability that it is:

(i) A man?

(ii) Graduate woman?

(iii) A graduate or a man?

(iv) A graduate man or a woman?

b) An urn contain 6 red, 3 black and 4 yellow marbles. If three marbles are drawn at random find the probability of choosing:

(i) all of the same colour

(ii) all of different colour

(iii) exactly two black.