STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086
(For candidates admitted during the academic year 2011 – 12& thereafter)

SUBJECT CODE : 11MT/PE/RS34

M. Sc. DEGREE EXAMINATION, NOVEMBER 2015
BRANCH I - MATHEMATICS
THIRD SEMESTER

COURSE : ELECTIVE
PAPER : RESEARCH IN STATISTICS
TIME : 3 HOURS **MAX. MARKS : 100**

SECTION – A (5 X 2 = 10)
ANSWER ALL THE QUESTIONS

1. Define research.
2. Define parameter and statistic.
3. What is case study?
4. Find the coefficient of range of 7 students of weights 27, 30, 35, 36, 38, 40, 43.
5. Define Type I and Type II errors.

SECTION – B (5 X 6 = 30)
ANSWER ANY FIVE QUESTIONS

6. What are Primary and secondary data? Distinguish between them.

7. Represent by a bar diagram the following data:

Items of Expenditure	**Family A**	**Family B**
Food	150	350
Clothing	38	120
Rent	360	130
Education	24	68
Miscellaneous	70	95

8. Represent the following data by a pie diagram.

Food crops	Rice	Wheat	Barley	Jowar	Bajra	Maize	Others
Area in(000,000 acres)	8	8	4	2	2	5	11

9. The following table gives the frequency distribution of expenditure on education per family per month among middle class families in a town.

Expenditure	3-6	6-9	9-12	12-15	15-18	18-21	21-24
No. of families	28	292	389	212	59	18	2

Find the arithmetic mean and standard deviation of expenditure.

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10. Find the quartile deviation and quartile dispersion for the following data

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	20	45	85	160	70	55	35	30

11. The average numbers of articles produced by two machines per day are 200 and 250 with standard deviation 20 and 25 respectively on the basis of records of 25 days production. Can you regard both the machines equally efficient at 1% level of significance?

12. A stenographer claims that she can type at the rate of 120 words per minute. Can we reject her claim on the basis of 100 trails in which she demonstrates a mean of 116 words with a standard deviation of 15 words? Use 5% level of significance.

SECTION – C (3 X 20 = 60)
ANSWER ANY THREE QUESTIONS

13. (a) Two research workers classified some people in income groups on the basis of sampling studies . Their results are as follows:

Investigators	Income groups			Total
	Poor	Middle	Rich	
A	160	30	10	200
B	140	120	40	300
Total	300	150	50	500

Show that the sampling technique of at least one research worker is defective. (Tabulated chi-square is 5.991 at 2 degree of freedom).

(b) Explain the different types of probability sampling. (10+10)

14. (a) Draw a Histogram and frequency polygon for the data given below:

Weekly wages	20-24	25-29	30-34	35-39	40-44	45-49
No. of workers	4	5	12	23	31	10

(b) Draw a Lorenz curve from the following data:

Amount of profit (in lakhs of Rs)	150	160	600	840	1050	1500	1700	4000
No. of companies	28	20	34	30	28	26	22	12

(10+10)

15. (a) Find the mean , median, and mode for the following

Class	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
Freq	3	7	13	17	12	10	8	8	6	6

(b) State the properties of a normal distribution (10+10)

16. (a) Distinguish between diagram and graph.
(b) The weekly salaries of a group of employees are given in the following table. Find the mean and standard deviation of the salaries.

Salary	10	11	12	13	14	15	16
No. of person	2	7	11	15	10	4	1

(10+10)

17. (a) Explain classification and tabulation of data in detail.

(b)An analysis of the monthly wages gives the following results:

	Firm A	Firm B
No. of workers	500	600
Average monthly wages	186	175
Variance of distribution of wagers	81	100

i. Which firm has a larger bill?

ii. In which firm is there greater variability in individual wagers?

(10+10)