STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 86
(For candidates admitted from the academic year 2011 – 2012)

SUBJECT CODE: 11EC/AC/SE24

B. A. DEGREE EXAMINATION, APRIL 2012
BRANCH IV - ECONOMICS
SECOND SEMESTER
COURSE   : **ALLIED – CORE**
PAPER   : **STATISTICS FOR ECONOMICS -II**
TIME   : **3 HOURS.**   **MAX. MARKS: 100**
SECTION – A
ANSWER ALL QUESTIONS IN 50 WORDS EACH.   **(10x3=30)**

1. Define correlation with a suitable example from Economics.
2. Give the mathematical properties of the coefficient of correlation.
3. Define a) equally likely events   c) dependent events
             b) Independent events   d) mutually exclusive events
4. A can solve 90% of the problems given in c book and B can solve 70%. What is the probability that atleast one will solve the problem selected at random?
5. Why are there two regression lines in general? When do they coincide?
6. Find the mean values of x and y given the equations of the two regression lines as
$5x - y = 22$ and $64x - 45y = 24$
7. State the components of time series data.
8. Give the merits and limitations of the method of least squares.
9. What are type I and type II errors?
10. Define the power of a test. How is it measured?

SECTION – B
ANSWER ANY FIVE QUESTIONS IN 300 WORDS EACH.   **(5x6=30)**
11. Calculate Karl Pearson's coefficient of correlation for the following data

X :	12	9	8	10	11	13	7
Y:	14	8	6	9	11	12	3

12. What are the different types of Correlations? Give an outline of the Scatter diagram method.

13.a. State the properties of the linear regression coefficients.
   b. For the following observations find byx and bxy and hence find the correlation coefficient between x and y
$$\{(x, y)\} = \{(4,2), (2,3), (3,2), (4,4), (2,4)\}$$

14. State and prove the addition theorem of probability

15. A manufacturer of pins knows that on an average 5% of his products are defective. He sells pins in boxes of 100 and claims that not more than 4 pins will be defective. What is the probability that a box will meet the generated quality. (e^{-5}=0.0067)

16. In a sample of 600 students of a certain college 400 are found to use dot pins. In another college from a sample of 900 students 450 were found to use dot pins. Test whether the two colleges are significantly different with respect to the habit of using dot pins.

17.   What are the assumptions underlying χ^2 test? Give the important uses of a χ^2 test.

SECTION – C
ANSWER ANY TWO QUESTIONS 1200 WORDS EACH.   (2x20=40)

18.a.   Define Spearman's rank correlation coefficient. Under what circumstances is it used?

  b.   Calculate the rank correlation for the following data

X:	48	33	40	9	16	16	65	24	16	57
Y:	13	13	24	6	15	4	20	9	6	19

19.a.   What is the normal distribution? List out its properties.

  b.   In a manufacturing organization the distribution of wages was perfectly normal and the number of workers employed was 5000. The mean wages of the workers were calculated as Rs.800 per month and the standard deviation is Rs.200. Estimate.

  i.   The number of workers getting salary between Rs.700 and Rs.900.
  ii.   Percentage of workers getting salary above Rs.1000
  iii. Percentage of workers getting salary above Rs.600

20.a.   Two types of drugs were used on 5 and 7 patients for reducing their weight. Drug A was imported and drug B was indigenous. The decrease in weight after using the drugs for 6 months were as follows

Drug A:	10	12	13	11	14		
Drug B:	8	9	12	14	15	10	9

  Is there a significant difference is the efficacy of the two drugs.

  b   Two investigators study the income of a group of persons by the method of random sampling.
  Following results were obtained by them

Investigator	poor	middle class	well to do	total
A	160	30	10	200
B	140	120	40	300
Total	300	150	50	500

  Show that the sampling technique of atlease one of the investigators is suspected
$$(\chi^2_{0.05} = 5.991)$$

21.   Explain the various methods of determining trend in a time series.

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