

**STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 86**  
**(For Candidates admitted during the academic year 2015 – 2016 and thereafter)**

**SUBJECT CODE: 15EC/AC/SE15**

**B.A. DEGREE EXAMINATION NOVEMBER 2017**  
**BRANCH IV – ECONOMICS**  
**FIRST SEMESTER**

**COURSE : ALLIED - CORE**  
**PAPER : STATISTICS FOR ECONOMICS**  
**TIME : 3 HOURS**

**MAX. MARKS: 100**

**SECTION – A**

**ANSWER ANY TEN QUESTIONS. EACH ANSWER NOT TO EXCEED 50 WORDS**  
**(10x2=20)**

1. Define Correlation.
2. State the relationship between regression coefficient and correlation coefficient.
3. If covariance between X and Y variables is 10 and the variance of X and Y are respectively 16 and 9. Find the coefficient of correlation.
4. What is probability?
5. A bag contains 30 balls numbered from 1 to 30. One ball is drawn at random. Find the probability that the number of ball drawn will be a multiple of 5 or 7.
6. State the multiplication theorem of Probability.
7. Distinguish between null hypothesis and an alternative hypothesis.
8. List the applications of t test.
9. What is analysis of variance?
10. What are the components of time series?
11. List out the significance of studying trends.
12. Give an illustration to cyclical variations in economics.

**SECTION – B**

**ANSWER ANY FIVE QUESTIONS. EACH ANSWER NOT TO EXCEED 400 WORDS**  
**(5x8=40)**

13. Calculate Karl Pearson's coefficient of correlation for the following data and interpret its value:

Roll. No. of the Students:	1	2	3	4	5
Marks in Accountancy:	48	35	17	23	47
Marks in Statistics:	45	20	40	25	45

14. From the following data obtain the two regression line:

X:	6	2	10	4	6
Y:	9	11	5	8	7

15. A man has three coins A, B, C. A is unbiased. The probability that a head will result when B is tossed is  $\frac{2}{3}$ , the probability that a head will result when C is tossed is  $\frac{1}{3}$ . If one of the coin chosen at random is tossed three times, giving a total of two heads and one tail, find
- The probability that the chosen coin is A
  - The probability that a fourth toss of the same coin will give a head.
16. If 10% of the screws produced by an automatic machine are defective, find the probability that 20 screws selected at random, there are
- at the most three defectives
  - at least two defectives; and
- Find also the mean, variance and skewness of the number of defective screws.
17. Two types of drugs were used on 5 and 7 patients for reducing their weight. Drug A was imported and drug B indigenous. The decrease in the weight after using the drugs for six months was as follows:

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

Is there significant difference in the efficacy of the two drugs? If not, which drug would you buy?

18. Calculate standard error of mean from the following data showing the amount paid by 100 firms in Calcutta on the occasion of new year.

Amount Paid (Rs):	34-44	44-54	54-64	64-74	74-84	84-94	94-104
No of firms (f):	2	3	11	20	32	25	7

19. The sale of a commodity in tones varied from January 2001 to December 2001 as follows:

Month	Jan.	Feb.	Mar.	Apr.	May.	Jun.
Sales	280	300	280	280	270	240
Month	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Sales	230	230	220	200	210	100

Fit a trend line by the method of semi-average. Plot the original values and trend on a graph paper.

20. From the following data calculate the four-year moving average and determine the trend values.

Year:	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Value:	50.0	36.5	43.0	44.5	39.8	38.1	32.6	41.7	41.1	33.8

## SECTION – C

ANSWER ANY TWO QUESTIONS. EACH ANSWER NOT TO EXCEED 1000

WORDS

(2x20=40)

21. A firm selling four products is interested in finding out whether the sales are distributed similarly among our general classes of customers. A random sample of 400 sales records provides the following information:

Customer's Group	Products				
	1	2	3	4	Total
Partners	25	10	35	15	80
Factory workers	32	20	10	28	90
Businessmen	35	48	25	40	148
Professionals	28	22	15	17	82
Total	120	100	80	100	400

Formulate suitable hypothesis. Apply  $\chi^2$  – test. What conclusion can you draw from the test results?

22. (a) Bring out the properties of normal distribution.

(b) The customer accounts of a certain departmental store have an average balance of Rs.120 and a standard deviation of Rs. 40. Assuming that the account balances are normally distributed, find

- What proportion of accounts is over Rs. 150?
- What proportion of account is between Rs. 100 and Rs. 150?
- What proportion of account is between Rs. 60 and Rs. 90?

23. (a) Two samples gave the following results:

$$n_1 = 10, \quad \Sigma(x_i - \bar{x})^2 = 90$$

$$n_2 = 12, \quad \Sigma(y_i - \bar{y})^2 = 108$$

Test whether the samples came from the population with the same variance.

(b) The following table gives the yields of 15 sample plot under three varieties of seed.

A	B	C
20	18	25
21	20	28
23	17	22
16	15	28
20	25	32

Test using analysis of variance whether there is a significant difference in the average yield of seeds.

24. Fit a straight line to the following data by the least squares method after summing the given quarterly data due to yearly data.

Year	Export of Cotton Textiles (million Rs.)			
	I Quarter	II Quarter	III Quarter	IV Quarter
1980	10	13	14	12
1981	12	14	15	13
1982	13	15	18	14
1983	15	19	21	18
1984	15	22	23	20
1985	20	21	25	20

And also find out short period fluctuation for the given years using additive model.

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