STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 600 086.
(For candidates admitted during the academic year 2004-2005 & thereafter)

B.Com. DEGREE EXAMINATION APRIL 2008
COMMERCE
FOURTH SEMESTER

COURSE   :   **ALLIED – OPTIONAL**
PAPER   :   **APPLIED STATISTICS**
TIME   :   **3 HOURS**   **MAX. MARKS : 100**

SECTION – A

ANSWER ALL QUESTIONS: (10 x 3 = 30)

1.   What are the components of time series?

2.   Fit a trend line to the following data by the free hand method:

YEAR	1999	2000	2001	2002	2003	2004	2005	2006	2007
Production of steel (million tones)	20	22	24	21	23	25	23	26	25

3.   Given the trend equation $Y = 110 + 2x$. Shift the origin to 2005. (origin 2001, time unit 1 year).

4.   State the condition under which the binomial distribution tends to a normal distribution.

5.   Define a Poisson distribution. What are the mean and variance of this distribution.

6.   If the probability of a defective bolt is 0.1. Find a) the mean b) standard deviation of defective bolts in a total of 900. Calculate the skewness.

7.   What are type I and type II errors?

8.   State the additive property of a chi-square distribution.

9.   What is Analysis of variance and where it is used?

10.   A sample of size 9 from a normal population has mean 15.8 and standard deviation 10.3. Find a 99% confidence interval for population mean. Given the tabulated value as 2.31.

SECTION – B

ANSWER ANY FIVE QUESTIONS: (5 x 8 = 40)

11.   Compute the average seasonal movement for the following series:

YEAR	QUARTERLY PRODUCTION			
	I	II	III	IV
1998	3.5	3.9	3.4	3.6
1999	3.5	4.1	3.7	4.0
2000	3.5	3.9	3.7	4.2
2001	4.0	4.6	3.8	4.5
2002	4.1	4.4	4.2	4.5

12.   At a busy traffic junction the probability of an individual having an accident is
       0.001. However, during a certain part of the day 100 cars pass trough the
       junction. What is the probability that two or more accidents occur during that
       period ($e^{-0.1}$ = .9048).

13.   State the properties of a normal distribution.

14.   An unbiased coin is tossed eight times and the number of heads noted. The
       experiment is repeated 256 times. Fit a Binomial distribution.

15.   How many pairs of observations must be included in a sample in order that an
       observed correlation coefficient of value 0.42 shall have calculated value of t
       greater than 2.72?

16.   The results of a certain survey shows that out of 50 ordinary shops of small size,
       35 are managed by men of which 17 are in cities, 12 shops in villages are run by
       women. Can it be inferred that shops run by women are relatively more in
       village that in cities. Test whether the above observation shows evidence that the
       shops run by women are more in villages than in cities.

17.   Explain the techniques of analysis of variance for a two-way classification data.

SECTION – C

ANSWER ANY TWO QUESTIONS: (2 x 15 = 30)

18.   The following table gives the sterling assets of the R.B.I in crores of Rs.
       a) Represent the data graphically
       b) Fit a straight line trend
       c) show the trend on the graph.

YEAR	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02
ASSETS	83	92	71	90	167	191

       Also estimate the figure for 2006 – 07.

19. a) In a distribution exactly normal 7% of the item are under 35 and 89% are under 63. What are the mean and standard deviation of the distribution.

   b) Four coins are tossed simultaneously. What is the probability of getting (i) 2 heads and 2 tails (ii) atleast two heads (iii) atleast on head.

20. Given two groups of students, the marks obtained are as follows:

First group	18	20	36	50	49	36	34	49	41
Second group	29	28	26	35	30	44	46		

   Examine the significance of difference between the arithmetic mean of the marks secured by the students of the above 2 groups.

21. Three samples, each of size 5, were drawn from three uncompleted normal population with equal variance. Test the hypothesis that the population means are equal at 5% level.

Sample 1	10	12	9	16	13
Sample 2	9	7	12	11	11
Sample 3	14	11	15	14	16

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