LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **STATISTICS**

FIFTH SEMESTER – **NOVEMBER 2014**

ST 5508 - APPLIED STATISTICS

Date : 30/10/2014 Dept. No. Max. : 100 Marks

Time : 09:00-12:00

PART - A

Answer ALL the questions. (10 x 2 = 20 Marks)

1. Define the term Index Number.
2. What are the errors in the construction of Index number?
3. Mention any two scaling procedure used in psychology and education.
4. What is effect of Test length on the Reliability of the test?
5. Write a short note on census method.
6. Define Stationary Population.
7. What are the components of Times Series?
8. Mention any two drawbacks of Moving Average.
9. State any two uses of Time series.
10. Why do we measure Seasonal variation?

PART - B

Answer any FIVE questions (5 x 8 = 40 Marks)

11. What are the different types of Index numbers? Explain them.
12. Change the base for following data with base 2004 = 100. By what percent did the price of the commodity rise between 2000 & 2005.

Year	2000	2001	2002	2003	2004	2005
Old price index for the commodity Base (1995 = 100)	141.5	163.7	158.2	156.8	157.1	160.7

13. What are the different methods of Determining Test Reliability? Explain in detail any one of the methods.
14. Compute the Gross and Net reproduction rates from the data given below:

Age (years)	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Fertility Rate	0.0108	0.0662	0.0675	0.0413	0.0216	0.0063	0.0004
Survival Rate	0.969	0.967	0.963	0.958	0.952	0.942	0.928

15. Mention the uses of Life Tables.
16. Explain the mathematical model for Time series.
17. Fit a parabolic curve of second degree to the data given below and estimate the sales for 2008.

Year	2002	2003	2004	2005	2006
Sales in ('000 Rs.)	10	12	13	10	8

18. Work out the 4-yearly moving average for the following data:

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Tonnage of goods carried	2204	2500	2360	2680	2424	2634	2904	3098	3172	2952	3248	3172

PART - C

Answer any TWO questions (2 x 20 = 40 Marks)

19. a) How does Indices help in Industrial production? **(6 marks)**

b) The following table shows the average wages in rupees per hour of workers in a factory during the year 1987 to 1988. So also are given the Consumer Price Indices for these years with 1987 to1989 as the base period.

Year	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Avg. Wage of workers in Rs. Per hour	119	133	144	157	175	184	189	194	197	213	228	245
Consumer Price Indices (1987-89) as base period.	95.5	102.8	101.8	102.8	111.0	113.5	114.4	114.8	114.5	116.2	120.2	123.5

(i) Determine the real wages of the rail road workers during the years 1988-1998 as compared to their wages in1987.

(ii) Use the Consumer Price Index to determine the Purchasing Power of a rupee for the various years assuming that in 1987, one rupee was strictly worth rupee one in purchasing power. **(14 marks)**

20. Explain about any two principle method used for the construction of Abridged Life table.

21. a) Write down the merits and demerits of Trend fitting by the Principle of Least Squares. **(5 marks)**

b) The following data gives the population figures of India:

Census year (x)	1911	1921	1931	1941	1951	1961	1971
Population (in crores)	25.0	25.1	27.9	31.9	36.1	43.9	54.7

Fit an exponential trend $y = ab^x$ to the above data by the method of least squares and find the trend values. Estimate the population in 1981, 2001 and 2011 **(15 marks)**

22. Apply ratio to moving average method to calculate seasonal indices from the following data:

2002	No. of persons visiting a place of interest	2003	No. of persons visiting a place of interest	2004	No. of persons visiting a place of interest
Jan.	90	Jan.	100	Jan.	110
Feb.	85	Feb.	89	Feb.	93
March	70	March	74	March	78
April	60	April	62	April	66
May	55	May	55	May	58
June	45	June	47	June	40
July	30	July	30	July	35
Aug.	40	Aug.	43	Aug.	45
Sep.	70	Sep.	65	Sep.	72
Oct.	120	Oct.	127	Oct.	130
Nov.	115	Nov.	118	Nov.	118
Dec.	118	Dec.	120	Dec.	124