LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

FIFTH SEMESTER – **NOVEMBER 2017**

ST 5508 / ST 5506 / ST 5502 – APPLIED STATISTICS

Date: 01-11-2017 Dept. No. Max. : 100 Marks

Time: 09:00-12:00

PART-A

ANSWER **ALL** QUESTIONS: **(10 x 2=20)**

1. State any two problems involved in the construction of index numbers.
2. Mention any two uses of cost of living index numbers.
3. What are the scaling procedures used in psychology and education?
4. Define Reliability.
5. Define rate of vital event.
6. Write the formula for specific death rate.
7. What is meant by trend in time series analysis?
8. Give the equation for Gompertz curve.
9. What is meant by de-seasonalising the given data?
10. State the merits of ratio to moving average method.

SECTION B

ANSWER ANY **FIVE** QUESTIONS: **(5 X 8 = 40)**

11. From the chain base index numbers given below, Obtain the fixed base index numbers:

Year :	2000	2001	2002	2003	2004	2005
Chain indices:	105	75	71	105	95	90

12. In the construction of certain cost of living index number, the following group index numbers were found. Calculate the cost of living index number by the weighted geometric mean.

Group	Food	Fuel &lighting	clothing	House rent	Miscellaneous
Index No.	352	200	230	160	190
Weights	48	10	8	12	15

13. The fifth grade norms for a reading examination are, mean=60; standard deviation = 10, and for an arithmetic examination are mean = 26; standard deviation =4. Ram scores 55 on the reading test and 24 on the arithmetic test. Compute his standardized scores. In which test is he better?

14. Prove that $nPx = P_x P_{x+1} \ldots P_{x+n-1}$.

15. Explain the method of least squares for curve fitting.

16. From the data given below, calculate seasonal indices for I, II, III and IV quarters assuming the trend is absent.

	Year				
Quarter	2005	2006	2007	2008	2009
I	40	42	41	45	44
II	35	37	35	36	38
III	38	39	38	36	38
IV	40	38	40	41	42

17. Explain the ratio to moving average method.

18. Construct index numbers of price from the following data by applying
(i) Laspeyres (ii) Paasche and (iii) Fishers Ideal method.

Commodity	2006		2007	
	Price	Quantity	Price	Quantity
A	2	8	4	6
B	5	10	6	5
C	4	14	5	10
D	2	19	2	13

SECTION C

ANSWER ANY **TWO** QUESTIONS: **(2X 20 = 40)**

19. Apply the method of link relatives to the following data and calculate seasonal indices.

Quarter	2005	2006	2007	2008	2009
I	6.0	5.4	6.8	7.2	6.6
II	6.5	7.9	6.5	5.8	7.3
III	7.8	8.4	9.3	7.5	8.0
IV	8.7	7.3	6.4	8.5	7.1

20. Fill in the blanks in the portion of life table given below:

Age in Years :	l_x	d_x	P_x	q_x	L_x	T_x	e_x^o
7	90,000	500	?	?	?	48,50,000	?
8	?	400	?	?	?	?	?

21. (a) A test is administered on 400 pupils. It gave mean 60 and standard deviation 12. Complete the following table of equivalent raw scores.

Raw scores:	84	78	72	66	60	54	48	42	36
-scores :	-	-	1	-	0	-	-	-	-
Standard score :	-	-	-	-	-	45	-	-	-

(b) Convert the ten scores 1,2,3,.....10 into standard scores with mean 50 and standard deviation 10.

22. Below are given the figures of production (in '00 tonnes) of a fertiliser factory.

Year :	1996	1997	1998	1999	2000	2001	2002
Production ('000 tonnes):	77	88	94	85	91	98	90

(a) Fit a straight line by the least square method and tabulate the trend values.
(b) Eliminate the trend, assuming additive model. What components of the time series are thus left over?
(c) What is the monthly increase in production?

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