LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

SECOND SEMESTER – **APRIL 2022**

UST 2502 – APPLIED STATISTICS

Date: 18-06-2022 Dept. No. Max. :100 Marks

Time: 01:00-04:00

SECTION – A

Answer **ALL** the questions **10 x 2 = 20 Marks**

1. What is the criteria of selecting the base period in the construction of index numbers?
2. State the tests for a good index number.
3. Define 'Psychometry'.
4. Write a note on normalized scores.
5. Provide four uses of vital statistics.
6. State the assumptions used in the construction of life tables.
7. Define Time series.
8. Write the normal equations for fitting a parabolic curve.
9. Draw demand and supply curves.
10. Define Engel's law and draw Engel's curves.

SECTION – B

Answer any **FIVE** questions **5 x 8 = 40 Marks**

11. Explain the basic problems involved in the construction of index numbers.
12. Narrate base shifting , splicing and deflating of index numbers .
13. Write in detail about the components of Time series.
14. The population figures of India are given below:

Census year (t) :	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 curve $y = a\,b^t$ to the above data by the method of least squares and find the trend values.

15. Explain the different types of mortality rates.
16. Derive two approximate expressions using Taylor's series for force of mortality.
17. Find the T-scores corresponding to the test scores X for the following frequency distribution:

x	1	2	3	4	5	6	7
f	5	10	20	5	4	4	2

18. Explain Leontief's method (From Time series data) of estimating demand function.

SECTION – C

Answer any **TWO** questions **2 x 20 = 40 Marks**

19. Find price and quantity index numbers due to Laspeyre , Paasche ,Marshall-Edgeworth, Fisher and Walsch:

Commodity	Price(1995)	Quantity(1995)	Price(2005)	Quantity(2005)
A	20	8	40	6
B	50	10	60	5
C	40	15	50	15
D	20	20	20	25

20. Explain in detail the five methods of determining test reliability. (5x4 = 20)

21. Using Ratio-to-Moving average method, determine the quarterly seasonal indices for the following data. The data are the average price of tomato per k.g.

Year / Quarter	I	II	III	IV
2010	30	40	36	34
2011	34	52	50	44
2012	40	58	54	48
2013	54	76	68	62
2014	80	92	86	82

22(a) Explain the following:

(i) Crude birth rate (ii) General fertility rate (iii) Total fertility rate

(iv) Gross reproduction rate (v) Net reproduction rate. (5x2=10)

(b) Complete the following life table:

Age	l_x	d_x	p_x	q_x	L_x	T_x	e_x^0
20	693435	?	?	?	?	35081126	?
21	690673	-	-	-	-	?	?

(10)

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