LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

SECOND SEMESTER – **APRIL 2024**

UST 2502 – APPLIED STATISTICS

Date: 15-04-2024 Dept. No. Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

	SECTION A - K1 (CO1)	
	Answer ALL the Questions	
1.	**Define the following**	**(5 x 1 = 5)**
a)	Simple aggregate method	
b)	Standard scores	
c)	How to estimate the population in the middle of the periods [t_1, t_2]	
d)	Exponential smoothing	
e)	Price elasticity of demand	
2.	**MCQ - Choose the correct option**	**(5 x 1 = 5)**
a)	Purchasing power of money can be accessed through: i) Quantity index ii) Fisher's index iii) Volume index iv) Consumer price index	
b)	The greatest smoothing effect is obtained by using i) A moving average based on a small number of periods ii) Exponential smoothing with a small weight value iii) The root-mean-square error. iv) The barometric method	
c)	Utility function measures i) Level of satisfaction ii) Level of consumption iii) Total utility iv) Total price	
d)	Which one of the following methods is not a measure of population growth: (i) Total Fertility Rate (ii) Gross reproduction rate (ii) Net reproduction rate (iv) Pearl's vital index	
e)	Which of the following scores assumes "the parent distribution of the trait is normal" i) Standard deviation scores ii) Percentile scores iii) T-score iv) Rank scores	
	SECTION A - K2 (CO1)	
	Answer ALL the Questions	
3.	**True or False**	**(5 x 1 = 5)**
a)	Index numbers help in studying Trends and Tendencies	
b)	The various growth curves can be fitted by the principles of least squares	
c)	The data for constructing a life table are the census data and death registration data	
d)	T scores are obtained from normalized scores	
e)	Family budget data are useful for estimating elasticities	
4.	**Fill in the blanks**	**(5 x 1 = 5)**
a)	Index number is always expressed in ----------	
b)	Best method to find seasonal variation is----------	
c)	Coefficient of reliability is defined as ----------	
d)	Complete expectation of life of a person attaining age x is obtained by using the formula ----------.	

e) "Demand for a commodity, in general, varies in the direction opposite to that of price whereas supply in general varies in the same direction as price" is called laws of ----------

SECTION B - K3 (CO2)

Answer any TWO of the following **(2 x 10 = 20)**

5. From the following data, construct a price index number of the group of five commodities by using Fisher's method and Marshall-Edgeworth's Method

Commodity	Base Year		Current Year	
	Price (Rs.)	Quantity (kg)	Price (Rs.)	Quantity (kg)
A	25	49	2000	50
B	22	18	1200	30
C	54	16	1320	44
D	20	40	1350	45
E	18	30	630	15

6. Discuss in detail various fertility rates which are commonly used.

7. Discuss in detail fitting of Logistic curve and give the properties of Logistic curve.

8. Discuss Family budget data and Time series data required for estimating elasticities.

SECTION C – K4 (CO3)

Answer any TWO of the following **(2 x 10 = 20)**

9. a) List the main steps on the construction of the cost of living index number. (5)

b) Construct the cost of living index for the year 2015 using the method of weighted price relatives (5)

Items	Price (Rs)		weight
	2001	2015	
A	50	75	10%
B	60	75	25%
C	200	240	20%
D	80	100	40%
E	160	200	5%

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

11. Narrate base shifting, splicing and deflating of index numbers.

12. Discuss Engel's law and Engel's curve

SECTION D – K5 (CO4)

Answer any ONE of the following **(1 x 20 = 20)**

13. Explain the various methods of scaling scores bringing out the underlying importance of normal distribution.

14. Discuss the mathematical test to check the formula error to have a good index number. Verify these tests for Laspeyres, Paasches, Fishers, Kellys and Marshall-Edgeworth formula.

SECTION E – K6 (CO5)

Answer any ONE of the following **(1 x 20 = 20)**

15. Find the missing entries in the following extract from a life table:

x	l_x	d_x	p_x	q_x	L_x	T_x	e_x^0
20	71167	----	----	----	----	----	----
21	70768	----	----	----	----	----	----
22	70367	403	----	----	70166	2394139	----

16. Explain in detail Leontief's method and Pigou's method.

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