DBX-18

Seat No. _____

B. Sc. (Sem. II) Examination

July - 2022

Elective Statistics

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

1 (a) Give the answer of following question : **4**

(1) If mean of 10 observations is 23. Now subtract 5 from each observation then new mean of new observation will be _____.

(2) _____ is the formula of Geometric mean.

(3) If $P_{20} = 40$ then _____ percentile rank of 40.

(4) Mean is the ideal measure of _____.

(b) Write any one : **2**

(1) Write notes on Geometric mean.

(2) In the intelligence test taken in a class of 100 students, percentile rank of Suresh is 92.5. Find the rank obtained by Suresh in the test.

(c) Write any one : **3**

(1) Find D_1 and P_{80} of the data consisting of natural numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11.

(2) State merits and demerits of Mode.

(d) Write any one : **5**

(1) Find the Median for the following data :

Class	0-7	7-14	14-21	21-28	28-35	35-42	42-49	49-56
Frequency	26	31	35	42	82	71	54	19

(2) Find the mean of the following frequency distribution

Class	0-49	50-99	100-149	150-199	200-249	250-299	300-349
f_i	10	15	30	20	15	8	2

2 (a) Give the answer of following question : **4**

(1) Coefficient of variation of 5, 5, 5, 5, 5, 5, 5 is _____.

(2) If mean = 120, Mode = 20 and standard deviation = 150 then coefficient of skewness is _____.

(3) If Mean is 37 and standard deviation is 25 then coefficient of variation is _____.

(4) If highest and lowest observations are 80 and 24 then coefficient of Range is _____.

(b) Write any one : **2**

(1) Write notes on Range and Mean deviation about mean.

(2) Write notes on skewness.

(c) Write any one : **3**

(1) For the frequency distribution of a data, quartile deviation = 1/3 (median) = 6. If sum of the extreme quartiles is 28, find the coefficient of skewness.

(2) Find Bowley's coefficient of skewness using following data :

X_i	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
F_i	5	10	12	18	25	15	11	4

(d) Write any one : **5**

(1) In an inspection of 500 machines, the frequency distribution of their lifetimes in years are as follows. Using appropriate method, find the skewness and its coefficient.

Life (in years)	Less than 4	4-6	7-9	10-12	13-15	16-19	20 or more
No. of machines	26	119	198	86	39	20	12

(2) Find coefficient of variation using following data.

Marks	0-10	10-20	20-30	30-40	40-50
No. of Students	8	20	11	26	10

3 (a) Give the answer of following question : **4**

(1) _____ is the formula of fixed base method.

(2) In Index number weight types are _____.

(3) Write formula of convert fixed base index to chain base index number.

(4) _____ is an ideal average is considered in index number.

(b) Write any one : **2**

(1) State uses of cost-of-living index number.

(2) State merits of fixed base method.

(c) Write any one : **3**

(1) Convert the following fixed based index numbers into chain base index numbers.

Year	2007	2008	2009	2010	2011	2012
Index no.	94	98	102	95	98	100

(2) Calculate index numbers from the following data by using Laspeyer's, Pashe and Fisher's formula.

Commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	8	20	9	20
B	10	6	12	10
C	40	1	50	1
D	4	3	5	5
E	12	4	20	5

(d) Write any one : **5**

(1) For constructing cost of living index number for workers by family budget method using following data.

Commodity	Unit	Quantity (base year)	Price (base year)	Price (current year)
Rice	kg	10kg	1.50	2.00
Wheat	kg	20 kg	0.75	1.00
Pulses	kg	10 kg	1.25	2.00
Oil	kg	6 kg	2.00	5.00
Clothing	Metre	15 Metre	2.50	4.00
Kerosene	Liter	18 liters	0.50	0.60
House Rent	-	1	50.00	75.00

(2) A worker in Mumbai city monthly spends Rs. 350. The monthly cost of living index is 136. From the following data, find the expense on clothing and rent.

Group	Food	Clothing	Rent	Fuel	Misc.
Expense	140	?	?	56	63
Index no.	180	150	100	110	80

4 (a) Give the answer of following question : **4**

(1) In additive model O = T + S + C + 1 of Time series C is _____.

(2) There are _____ components in Time series.

(3) Among all component of time series _____ is most important.

(4) State the name of the method to know trend the time series.

(b) Write any one : **2**

(1) Write on irregular component of Time series.

(2) Give two uses of Time series.

(c) Write any one : **3**

(1) Find seasonal indices for the following time series.

Year	Q_1	Q_2	Q_3	Q_4
2009	50	45	48	53
2010	52	47	49	41
2011	51	45	48	52
2012	55	46	46	51

(2) For the following time series, find trend by using 5 yearly moving average. Also find short term fluctuation.

Year	1983	1984	1985	1986	1987	1988	1989
Production	200	194	181	178	202	247	258
Year	1990	1991	1992	1993	1994	1995	1996
Production	218	196	201	203	191	189	203

(d) Write any one : **5**

(1) Given below are the figures of production (in lakh kg) of a cement factory.

Year	2001	2002	2003	2004	2005	2006	2007
Production	40	45	46	42	47	50	46

(2) Find the trend by fitting the straight line for the following data.

Year	2001	2003	2005	2007	2009
Production	42	46	50	58	60

5 (a) Give the answer of following question : **4**

(1) For using Newton's method for interpolation distance between two consecutive values of x (independent variable) must be _____.

(2) In Binomial expansion method n^{th} difference is assumed _____.

(3) Excel files are called _____

(4) _____ function is used to calculate total in MS-Excel.

(b) Write any one : **2**

(1) Explain Lagrange's method.

(2) Explain MS Excel function MODE () with an example.

(c) Writ any one : **3**

(1) Find the estimated value of y when x = 12.5 by appropriate method. From the data given in the following table

x	11	12	13	14
y	20	23	27	32

(2) Write the required steps to find MIN, MAX, AVERAGE in MS-Excel.

(d) Write any one : **5**

(1) Using Binomial expansion method find the estimate of missing value of following data.

x	20	40	60	80
y	12	15	?	30

(2) Explain how MS excel is useful in statistical calculation in detail.