Seat No.

Kamala College, Kolhapur
(Autonomous)
B.Com (Part - II) (Semester - IV)
Examination March/April- 2024
AECC-6: BUSINESS STATISTICS (Paper - II)

Subject Code: AECC-6

Day and Date: Monday, 22/04/2024 **Total Marks: 40**
Time   : 08:00 am to 10:00 am

Instructions:
1. Attempt any FIVE questions.
2. Use of a simple calculator is allowed.
3. Figures to the right indicate full marks.
4. Each question carries 8 marks.

Q1) Attempt any two of the following: [8]

a) Difference between chance and assignable causes of variations.

b) Consider the quarterly sales data for a retail company over the past three years as follows:

Year	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Year 1 (Y1)	500	600	700	800
Year 2 (Y2)	550	620	720	850
Year 3 (Y3)	600	650	730	900

Calculate the seasonal indices for each quarter using the simple average method.

c) From the enquiry into family budget data of middle-class families of certain town in Maharashtra, the following information was obtained

Group	Percentage of total expenditure	Price in 1960	Price in 1958
Food	35	150	145
Rent	15	30	30
Clothing	20	75	72
Fuel	10	25	23
Miscellaneous	20	45	40

Compute the index number, showing the change in cost of living in year 1960 compared to 1958, for the middle-class families of this town of Maharashtra

Q2) State the problems involved in the construction of index numbers.: **[8]**
Calculate the cost-of-living index number of the following data.

Commodity	2003		2013
	Price	Quantity	Price
Wheat	170	562	72
Rice	192	535	70
Sugar	195	639	95
Ghee	187	128	92
Fuel	185	542	92
Gold	150	217	180

Q3) Define Normal distribution. State the properties of the normal probability curve. The weights in kg. of 1000 students are normally distributed with mean 40 kg. and S.D. 4 kg. Find the number of students with weights (i) less than 36 kg. , (ii) more than 45 kg. , (iii) between 36 kg and 45 kg.
(Given Area under curve for S.N.V. from $Z = 0$ to $Z = 1$ is 0.3413, from $Z = 0$ to $Z = 2$ is 0.4772 and from $Z = 0$ to $Z = 1.25$ is 0.3944) **[8]**

Q4) Define the probability of an event A. A box contains 25 tickets, numbered 1 to 25. A ticket is drawn at random from the box. Find the probability that a number on the ticket will be: **[8]**
i) an even number given that it is odd   ii) an odd number and prime
iii) a multiple of 3 or even   iv) not an even given that greater than 20

Q5) Define time series. State its uses. Compute 3 yearly moving average and progressive average from the following data: **[8]**

Year	2011	2012	2013	2014	2015	2016	2017	2018
Values	10	12	11	14	9	10	13	11

Q6) Explain the need for Statistical Quality Control techniques. State the control limits for Mean and Range charts. A sample of five items is taken every two hours from a factory and the following data are obtained:

[8]

Sample No.	1	2	3	4	5	6	7	8	9	10
Mean	23	35	31	41	29	38	46	19	15	40
Range	2	9	4	2	7	3	5	6	8	5

Construct a control chart for the mean examine whether the process is under control or not. (Given $A_2=0.58$ for n = 5)

Q7) Attempt any two of the following: [8]
  a) State probability mass function (p. m. f.) Binomial distribution. Find its parameters if the mean and variance are 5 and 4, respectively.
  b) b) State the relation between Laspeyre's, Paasche's, and Fisher's price index numbers.   If Paasches's and Fisher's price indices are 125 and 126 respectively. Obtain Laspeyre's price index.
  c) State the components of the time series. Explain secular trend.

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