Seat No.	

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B.Com (Part -II) (Semester - IV) (CBCS) Examination

Oct. /Nov. – 2023

College Name: - Kamala College, Kolhapur

Subject Name:-Business Statistics-II

Subject Code: 73524 **Total Marks: 50**

Day and Date: - Saturday, 02/12/2023 **Period: 2 hours**

Time: 02.30 pm. To 04.30 pm. **Total pages: 2**

Instructions

1) *Figures to the right indicate full marks*
2) *Attempt any FIVE questions.*
3) *Use of a simple calculator is allowed.*
4) *Each question carries 10 marks.*
5) *Graph papers will be supplied on request.*

Q1) Attempt any two from the following: **[10]**

a) Explain chance and assignable causes of variations.

b) Draw a neat sketch of a standard normal curve and state its properties.

c) Compute the average of price relatives using arithmetic mean index number from the following data and comment on it.

Commodity	Rice	Wheat	Oil	Fish	Potato
Price in 2011	25	20	60	70	15
Price in 2021	40	34	120	140	30

Q2) 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: **[10]**

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 and examine whether the process is under control or not. (Given A_2=0.58 for n = 5)

Q3) Define time series. State its uses. Compute 3 yearly moving averages from the following data: **[10]**

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

Plot the original and trend values on the same graph

Q4) Give probability density function (p. d. f.) of Normal distribution. State its mean and variance. If weights (in kg) of 1000 students were found to be normally distributed with a mean weight of 45 kg and a standard deviation of 3 kg, Find the number of students with weights **[10]**

(i) less than 39 kg (ii) more than 48 kg (iii) in between 39 to 48 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)

Q5) Define index numbers and state their uses. The prices and quantities of commodities for 1993 and 1934 are given below: **[10]**

Calculate Laspeyre's, Paasche's and Fisher's index numbers from the following data treating 1933 as base year.

Commodity	1993		1934	
	Price	Quantity	Price	Quantity
Wheat	170	562	72	632
Rice	192	535	70	756
Sugar	195	639	95	926
Ghee	187	128	92	255
Fuel	185	542	92	632
Gold	150	217	180	314

Q6) 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: **[10]**

i) an even number ii) an odd number

iii) a multiple of 3 or 5 iv) a multiple of 3 and 5

Q7) Attempt any two from the following: **[10]**

a) State probability mass function (p. m. f.) Binomial distribution. Find its parameters if the mean and variance of Binomial distribution are 6 and 3, respectively.

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 cyclic variation.