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Shree Damodar College of Commerce & Economics, Margao-Goa

BBA(FS), Semester- II (REGULAR) Semester End Assessment June-July 2022

Data Analysis & Quantitative Techniques (BFS CC 8)

Duration: 2hrs

Maximum Marks:60

Instructions:

- 1) Start each question on fresh page.
- 2) Figures to the right indicate maximum marks.
- 3) Use graph paper to draw the graphs
- 4) Q1. is compulsory, however internal choice is available.
- 5) Answer 'any 4' from Q2. to Q7.
- 6) The Z distribution table will be provided on request

Q1. Answer ANY 5 of the following:

(5x4=20 Marks)

- A. The number of deaths occurring every year due to road accidents in India during the years 2011 to 2019 were as follows. Find the trend by method of 5 yearly moving average. Comment on the trend?

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019
No. of deaths (in Thousands)	142	138	137	139	146	151	153	154	156

- B. Mr. X is excited about summer vacation. However, his parents are worried since the teenager would be sitting home and playing games on mobile and switching on Air condition the whole time. They noted the various temperature and the units consumed by them during last year and found interesting data, and they wanted to anticipate their upcoming May month bill, and they are expecting the temperature to be near 40°C, but they want to know is there any correlation between Temperature and electricity bill?

Temperature (in °C)	Electricity Bill (in 1000 Rs)
25	2
35	4
42	6
46	7

- C. A stock trader, wants to calculate the three yearly moving average for PepsiCo by looking at the closing prices of the stock for the last six years. The closing stock prices for PepsiCo for the last six years are as follows:

Year	2016	2017	2018	2019	2020	2021
Year Close price	105	120	110	137	148	174

Help the stock trader showing the trend on the graph. Does it show increasing or decreasing trend?

D. A lot of 4000 articles manufactured in a factory contains 500 defective articles. If two articles are picked from a lot at random, find the probability that they are non-defective.

E. The petrol prices in Goa have been changing over few months. The following table gives the recent changes in petrol prices, Find the trend values assuming four yearly cycle. The prices show increasing or decreasing trend?

Date	Petrol Price
06-Apr-22	₹ 106.45
05-Apr-22	₹ 105.64
04-Apr-22	₹ 104.84
03-Apr-22	₹ 104.43
02-Apr-22	₹ 103.63
31-Mar-22	₹ 102.82
30-Mar-22	₹ 102.01

F. One lottery ticket is drawn at random from a set of 40 tickets numbered from 1 to 40. What is the probability that the number on the ticket drawn is divisible by

a) 2 and 3

b) 3 or 4

Q2. The manager of an assembly line in a clock manufacturing plant decided to study how different speeds of the conveyor belt affect the rate of defective units produced in an 8-hour shift. To examine this, he ran the belt at four different speeds for a five 8- hour shifts each and measured the number of defective units found at the end of each shift. The results of the study were given in the table below. Can you help the manager to make an inference from the trial data by performing a one-way ANOVA? ($F_{(16,3)} = 3.24$) **(10 Marks)**

Defective units per shift			
Speed 1	Speed 2	Speed 3	Speed 4
7	1	2	5
5	2	6	1
8	2	3	3
6	4	4	2
4	1	10	1

Q3. Total sales volume of Tata motors Limited from financial year 2016 to 2021 (in 1000 units) is given below, fit the linear trend and estimate the volume of sales for financial year 2022. **(10 Marks)**

Year	2016	2017	2018	2019	2020	2021
Sales (in 1000 Units)	523	542	638	732	473	485

Q4. Company XYZ observed changes in sales as they increased the advertisement expenditure of their latest products. Using the chart given below, comment if there is any correlation between the sales and advertisements expressed in thousands of rupees using Spearman's rank correlation. **(10 Marks)**

Sales	90	85	68	75	85	80	95	70
Advertisement expenditure (in 1000)	7	6	2	3	5	5	8	1

Q5. We have a dataset where the income of various car dealers is provided along with the number of cars sold at their showroom. Find, **(10 Marks)**

- A) Arithmetic means
- B) Variances
- C) Standard Deviation
- D) Covariance
- E) The coefficient of correlation
- F) The coefficients of regression
- G) The equations of the lines of regression

Sales (in 100)	10	20	25	45	50	60	65	80	85	100
Income (in 1000)	2.5	1.5	2	2.5	3	4	3.5	4.5	4	5.5

Q6. Answer the following:

- A)** For a certain type of computers, the length of time between charges of the battery is normally distributed with a mean of 50 hours and a standard deviation of 15 hours. John owns one of these computers and wants to know the probability that the length of time will be: **(6 Marks)**

- a) Between 50 and 70 hours.
- b) Between 20 and 75 hours.

- B)** A customer help centre receives on average 3 calls every hour. **(4 Marks)**

- a) What is the probability that it will receive at most 4 calls every hour?
- b) What is the probability that it will receive at least 5 calls every hour?

Given $e^{-3} = 0.05$

Q7. Answer the following:

- A) Given the following information about the production and demand of a commodity, obtain the two lines of regression, if the correlation coefficient between the lines is 0.65. **(6 Marks)**

	Production	Demand
	x	y
Mean	85	90
Standard Deviation	5	6

- B) Mr. X wants to know if height is genetic or not. The following table shows heights of father and daughter. Compute the correlation between them by Karl Pearson's coefficient of correlation, and comment. **(4 Marks)**

Height of father (cm)	65	66	67	68
Height of daughter (cm)	67	68	64	69
