BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

USN | | | | | | | | | | **Course Code** | 2 | 2 | M | B | A | 1 | 4

First Semester MBA Degree Examinations, June 2023
BUSINESS STATISTICS

Duration: 3 hrs   **Max. Marks: 100**

Note: *1. Answer any **FOUR** full questions from Question No. 1 to 7.*
       2.Question No. 8 is compulsory
       3. Missing data, if any, may be suitably assumed

Q. No		*Question*	*Marks*	*(RBTL:CO:PO)*
1.	**a.**	Define statistics and mention its applications.	**03**	(1 :1 : 1)
	b.	The no. of workers employed, the mean wages in Rs. per month in each section of a factory are given below:	**07**	(2 :1 : 1)

Section	No. of workers employed	Mean wages (Rs)
A	50	1113
B	60	1120
C	90	1115

Calculate the mean wages of all the workers taken together.

	c.	The temperature of two cities A and B in winter season are given below:	**10**	(2 :1 : 1)

Temperature (degree Celsius of city A)	18	20	22	24	26
Temperature (degree Celsius of city B)	11	14	15	17	18

Analyze the problem and conclude which city is more consistent in temperature changes?

2.	**a.**	Define standard deviation and mention its applications.	**03**	(1 :1 : 1)
	b.	Calculate median from the following data:	**07**	(3 :1 : 1)

Heights in Cm	145-150	150-155	155-160	160-165	165-170	170-175	175-180
No. of persons	2	4	12	22	30	25	10

	c.	Calculate the GM for the following distribution:	**10**	(3 :1 : 1)

Yield of wheat	No. of Farms
7.5 – 10.5	5
10.5-13.5	9
13.5-16.5	19
16.5-19.5	23
19.5-22.5	7
22.5-25.5	4
25.5-28.5	1

3.	**a.**	Outline the meaning of correlation and mention any four uses of it.	**03**	(2 :2 : 2)

b. From the following data produce the two regression equations.   **07**   (3 :2 : 2)

Sales	91	97	108	121	67	124	51	73	111	57
Purchase	71	75	69	97	70	91	39	61	80	47

c. The share price of a company in Mumbai and Kolkata markets during the last months are recorded below: **10**   (3 :2 : 2)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Mumbai	105	120	115	118	130	127	109	110	104	112
Kolkata	108	117	120	130	100	125	125	120	110	135

Evaluate the given problem and determine Karl Pearson Correlation coefficient of shares.

4.

a. Outline concept of regression analysis and mention its uses.   **03**   (2 :2 : 2)

b. Distinguish between correlation and regression.   **07**   (3 :2 : 2)

c. Calculate spearman's rank correlation coefficient between advertisement cost and sales from the following data: **10**   (3 :2 : 2)

Advertisement cost ('000 Rs)	39	65	62	90	82	75	25	98	36	78
Sales (lakhs Rs)	47	53	58	86	62	68	60	91	51	84

5.

a. Summarize the concept of time series analysis and mention the methods used for the study and measurement of trend in time series.   **03**   (2 :3 : 3)

b. From the following series of annual data, calculate the trend values by the method of semi-averages.   **07**   (3 :3 : 3)

Year	Actual value
1990	170
1991	231
1992	261
1993	267
1994	278
1995	302
1996	299
1997	298
1998	340

c. Calculate the trend value from the following data using the method of least square.   **10**   (3 :3 : 3)

Year	2002	2003	2004	2005	2006	2007
Period	7	9	12	15	18	23

6.

a. Compare seasonal variation and cyclical variation.   **03**   (2 :3 : 3)

b. Calculate three-yearly moving average of the following data: **07**   (3 :3 : 3)

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
No. of students	15	18	17	20	23	25	29	33	36	40

Note: (RBTL - Revised Bloom's Taxonomy Level: CO - Course Outcome: PO – Programme Outcome)

c. You have been provided with the figures of production (in 000's tonnes) of a factory. **10** (2 :3 : 3)

Year	2011	2012	2013	2014	2015	2016	2017
Production	77	88	94	85	91	98	90

Evaluate the given problem and fit a straight line trend by the method of least square and find its trend values.

7. a. Discuss briefly on the following terms: **03** (2 :4 : 4)
Type I error and Type II error

b. Explain the procedure of hypothesis testing and describe the various stages involved. **07** (4 :4 : 4)

c. Two salesman A & B were working in a district. From a sample survey conducted by the Head office, the following results were obtained. **10** (3 :4 : 4)

Salesman	A	B
No. of sales made	20	18
Average sales (in thousands)	170	205
Standard deviation (in thousands)	20	25

Test at 1% level of significance whether the sales closed by salesman B is higher than that of salesman A.

8. a. Fertilizer A & B resulted in the yields of tomato listed in the following table. Find out whether the variances are different at 5% level of significance. **10** (3 :4 : 4)

Yield in Kg/Plot						
	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6
Fertilizer A	9	10	13	11	7	10
Fertilizer B	15	10	14	15	11	13

b. A particular food drink manufacturer claims that the drink improves the memory power of children. A nutritional desire to test the claim. He finds out the memory power of 10 children before they take the drink. Then he checks the memory of the same 10 children after making them drink the food drink continuously for one month. The dates are given in the following table. **10** (3 :4 : 4)

	Student No.									
	1	2	3	4	5	6	7	8	9	1
Memory power before the intake of drink	15	18	20	17	16	14	21	19	13	22
Memory power after the intake of drink	14	16	21	10	15	18	19	16	14	20

Find out at 5% level of significance whether the drink improves the memory power or not.

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