

BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

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Course Code

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First Semester MBA Degree Examinations, October/November 2022

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

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBTL:CO:PO)</u>
1.	a. Define the functions of statistics.	03	(1 : 1 : 1)

b.	Calculate the mean from the following data using (i) Direct method and (ii) Shortcut method.	07	(1 : 1 : 1)
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R. Nos	1	2	3	4	5	6	7	8	9	10
Marks	40	50	55	78	58	60	73	35	43	48

c.	Calculate the mean, median and mode for the data given below:	10	(2 : 1 : 1)
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Daily earnings (Rs.)	No. of persons
50-53	3
53-56	8
56-59	14
59-62	30
62-65	36
65-68	28
68-71	16
71-74	10
74-77	5

2.	a. List the methods of measuring dispersion.	03	(1 : 1 : 1)
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b.	For a group of 50 male workers, the mean and the standard deviation of their wages are Rs. 63 and Rs. 9 respectively. For a group of 40 female workers these are Rs. 54 and Rs. 6 respectively. Find the standard deviation for the combined group of 90 workers.	07	(3 : 1 : 1)
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c.	In two factories A and B, engaged in the same industrial area the average weekly wages (in rupees) and the standard deviations are as follows:	10	(3 : 1 : 1)
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Factory	Average	Standard deviation	No. of workers
A	34.5	5	476
B	28.5	4.5	524

(i) Which factory A or B pays out a larger amount as weekly wages?

(ii) Which factory A or B has greater variability in individual wages?

3. a. Explain the significance of study of correlation. **03** (2 : 2 : 2)
- b. A random sample of 5 college students is selected and their grades in Mathematics and Statistics are found to be: **07** (3 : 2 : 2)

	1	2	3	4	5
Mathematics	85	60	73	40	90
Statistics	93	75	65	50	80

Calculate Spearman's rank correlation coefficient.

- c. In a correlation analysis between production and price of a commodity the following constants were obtained: **10** (3 : 2 : 2)

	Production index	Price index
Arithmetic mean	110	98
Standard Deviation	12	5
r between production and price	-0.4	

Compute regression equation of price on production and calculate the price index when the production index is 116.

4. a. Define regression and mention its applications. **03** (2 : 2 : 2)
- b. From the following data calculate correlation coefficient. Take 65 and 70 as the assumed average of the variate X and Y respectively. **07** (3 : 2 : 2)

X	45	55	56	58	60	65	68	70	75	80	85
Y	56	50	48	60	62	64	65	70	74	82	90

- c. Find the rank correlation co-efficient from the following marks awarded by the examiners in a test. **10** (3 : 2 : 2)

Roll. No.	1	2	3	4	5	6	7	8	9	10	11
Examiner A	24	29	19	14	30	19	27	30	20	28	11
Examiner B	37	35	16	26	23	27	19	20	16	11	21
Examiner C	30	28	20	25	25	30	20	24	22	29	15

5. a. Mention the methods used for determining trends in time series. **03** (2 : 3 : 3)
- b. Calculate the trend values by the method of least square from the data given below and estimate the sales for 2010. **07** (3 : 3 : 3)

Year	2003	2004	2005	2006	2007
Sales of co. A (Rs. Lakhs)	70	74	80	86	90

- c. Find the seasonal index from the following table by ratio to moving average method: **10** (3 : 3 : 3)

Seasons	2003	2004	2005	2006	2007
Quarter 1	40	42	41	45	44
Quarter 2	35	37	35	36	38
Quarter 3	38	39	38	36	38
Quarter 4	40	38	42	41	42

6. a. Define time series. **03** (1 : 3 : 3)
 b. Calculate trend by four year moving average of the following data given below: **07** (2 : 3 : 3)

Year	Production	Year	Production
1997	614	2003	717
1998	615	2004	719
1999	652	2005	708
2000	678	2006	779
2001	681	2007	757
2002	655		

- 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
Production	7	9	12	15	18	23

7. a. Define null and alternative hypothesis. **03** (2 : 4 : 4)
 b. Explain various stages in testing of hypothesis. **07** (2 : 4 : 4)
 c. Intelligence test given to one group of girls and another group of boys showed the following results: **10** (3 : 4 : 4)

Gender	No. of students Tested	Standard Deviation	Mean Intelligence Score
Girls	50	10	75
Boys	100	12	70

Is the difference in the mean scores statistically different at 1% level of significance?

8. a. 500 units from a factory are inspected and 12 are found to be defective; 800 units from another factory are inspected and 12 are found to be defective. Can it be concluded at 5% level of significance that production at second factory is better than in the first factory. **10** (4 : 4 : 4)
 b. Calculate the correlation coefficient between the height of father and son from the given data. **10** (4 : 2 : 2)

Height of father (in inches)	64	65	66	67	68	69	70
Height of son (in inches)	66	67	65	68	70	68	72

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