



**P.E.S. College of Engineering, Mandya - 571 401**  
*(An Autonomous Institution affiliated to VTU, Belagavi)*  
**First Semester, Master of Business Administration (MBA)**  
**Semester End Examination; Jan. - 2020**  
**Business Analytics**

Time: 3 hrs

Max. Marks: 100

*Note: Answer all FOUR full questions from PART - A and PART - B (Case study) is compulsory.*

Q. No.	Questions PART - A	Marks
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|------|--|----|
| 1 a. | Define Statistics. Explain the important steps in Statistical investigation. | 10 |
| b.   | Explain the scope and limitations of statistics.                             | 10 |

**OR**

- 2 a. Represent the following data in a suitable diagram.

Particulars	Product X	Product Y
Direct Cost (Rs.)	120	150
Indirect cost (Rs.)	50	70
Profit (Rs.)	30	20
No. of Units sold	20	40
Price per unit (Rs.)	10	6

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|------|---|----|
| b.   | <p>A survey of 370 students from the commerce Faculty and 130 students from the science faculty revealed that 180 students were studying for only C.A. Examination, 140 for only Costing examinations and 80 for both CA and costing examinations. The rest had opted for part-time Management courses. Of those studying for costing only, 13 were girls and 90 boys belonged to the commerce faculty. Out of the 80 studying for both C.A. and Costing, 72 were from the commerce faculty amongst whom 70 were boys. Amongst those who opted for part-time Management courses, 50 boys were from the science faculty and 30 boys and 10 girls from the commerce Faculty. In all, there were 110 boys in the science faculty.</p> <p>Present this information in a tabular form. Find the number of students from the science faculty studying for part-time Management courses.</p> | 10 |
| 3 a. | Elaborate an objective and characteristics of calculating averages.   | 10 |
| b.   | A company paid bonus to the workers on the following basis:   |    |

Monthly salary (Rs.)	Bonus (Rs.)
700 - 800	500
800 - 900	580
900 - 1000	630
1000 - 1100	700
1100 - 1200	750
1200 - 1300	810
1300 - 1400	900
1400 - 1500	960

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The actual salary paid to the 40 workers are as follows:

725, 1450, 780, 1210, 1050, 910, 850, 930, 820, 1320, 1070, 980, 720, 930, 1270, 1340, 1435, 1390, 890, 970, 770, 1020, 940, 910, 990, 1250, 870, 740, 1220, 1330, 1440, 950, 1490, 1115, 960, 1500, 700, 960, 1150, 920.

Calculate the total bonus paid by the company and also calculate the average bonus paid.

**OR**

- 4 a. The following data is related to the net profits of 75 factories located in a city calculate  $Q_1$ ,  $Q_2$ ,  $Q_3$ , Median  $D_7$ ,  $P_{80}$  and  $P_{67}$ .

Net Profit (Rs. In '000s)	0 - 25	25 - 35	35 - 45	45 - 55	55 - 65
No. of Factories	12	18	30	8	7

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- b. Find the Arithmetic mean, Geometric mean and Harmonic mean for the following data:  
35, 24, 75, 50, 40 and prove that  $AM > GM > HM$ .

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- 5 a. The details regarding the production of goods in factories situated in a city are given below:

Production (in tones)	150	250	300	450	500	600
No. of Factories	3	9	12	20	5	4

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- b. Calculate the mean absolute deviation and its coefficient from median for the following data:

Year	Sales ( Rs. Thousand)	
	Product A	Product B
1996	23	36
1997	41	39
1998	29	36
1999	53	31
2000	38	47

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**OR**

- 6 a. Estimate standard deviation and coefficient of variation from the data given below.

Class Intervals	Frequency
0 - 15	14
5 - 10	26
10 - 15	32
15 - 20	45
20 - 25	39
25 - 30	12
30 - 35	9
35 - 40	2

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- b. From the following data on sales and No. of factories, estimate the coefficient of skewness and comment on the result.

Sales	No. of Factories
0 - 20	20
20 - 40	32
40 - 60	47
60 - 80	52
80 - 100	17
100 - 120	9
120 - 140	5

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- 7 a. The competition in a beauty contest was ranked by three judges in the following order:

First Judge	1	6	5	10	3	2	4	9	7	8
Second Judge	3	5	8	4	7	10	2	1	6	9
Third Judge	6	4	9	8	1	2	3	10	5	7

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Using the method of rank correlation to determine which pair of judge has the nearest approach to common taste in beauty.

- b. Compute the coefficient of correlation between the number of licensed vehicles and the number of motor accidents from the following data. Interpret the value you obtain.

Number of Licensed (Vehicles (in 000))	5.2	5.6	5.8	6.5	4.5	5.0	3.5
Motor Vehicle	11.6	12.0	12.3	12.4	15.0	14.2	11.7

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**OR**

- 8 a. From the following obtain two regression equations:

Sales (in 000)	91	53	45	76	89	95	80	65
Advertisement expenses	15	8	7	12	17	25	20	13

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Estimate the advertisement expenses for a sale of Rs.1,20,000

- b. Following are the two regression equations with respect to a distribution of X and Y

$$X = 5.7 - 0.32Y$$

$$Y = 8.4 - 0.52X$$

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Calculate the Arithmetic mean of X and Y and also calculate the coefficient of correlation between X and Y.

Contd...4

**PART - B (Case Study Compulsory)**

9 a. Following are the data related with the output of a factory for 7 years:

Year	1980	1981	1982	1983	1984	1985	1986
Output (in tones)	47	64	77	88	97	109	113

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Calculate trend values through the method of least squares and also forecast the production in 1989 and 1991.

b. Following are the data related with the prices and quantity consumed for 1990 and 1991:

Commodity	1990		1991	
	Price	Quantity	Price	Quantity
Rice	5	15	7	12
Wheat	4	5	6	4
Sugar	7	4	9	3
Tea	52	2	55	2

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Construct Price Index Numbers by,

- i) Laspeyre's method
- ii) Paasche's Method
- iii) Fisher's method

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