

Total No. of Questions : 5]

SEAT No. :

PA-3537

[Total No. of Pages : 5

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F.Y. B.B.A. (Semester - II)
205 : BUSINESS STATISTICS
(2019 Pattern)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Notations & abbreviations have their usual meaning.*
- 4) *Simple calculator is allowed.*

Q1) A) Fill in the blanks :

[5 × 2 = 10]

- a) In an exclusive type distribution, the limits excluded are _____.
- b) If the lower & upper limit of the class are 10 & 40 respectively, the mid-point of the class is _____.
- c) Mean is a measure of _____.
- d) The functional relationship of a dependent variable with Independent variable(s) is called _____.
- e) Best measure of dispersion is _____.

B) State whether the following statements are True or False : [3 × 2 = 6]

- a) Second quartile is same as Median.
- b) Mid-values of the classes are also called class-mark.
- c) Index numbers are expressed in terms of absolute value.

Q2) Attempt any four of the following :

[4 × 4 = 16]

- a) Define Arithmetic mean. State its two merits & demerits.
- b) Write a note on measures of dispersion.

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- c) Draw a frequency polygon for the following data.

Monthly House Rent	No. of families
100 - 300	6
300 - 500	16
500 - 700	24
700 - 900	20
900 - 1100	10
1100 - 1300	4

- d) Compute regression coefficients & hence verify that correlation coefficient lies between them.

$$h = 100, \bar{x} = 60, \bar{y} = 50, \sigma_x = 10, \sigma_y = 12$$

$$\sum (x - \bar{x})(y - \bar{y}) = 8400$$

- e) Suppose in Dec. 1995 land was purchased at cost Rs. 50,000. It was sold at cost Rs. 1,50,000 in Feb 2002. Find the real capital gain if the cost of inflation index in 1995-96 is 281 & that in 2001-02 is 426.
- f) Following is the data related to the frequency distribution of monthly wages of 100 workers.

Monthly Wages in Rs.	No. of Workers
4000 - 5000	11
5000 - 6000	15
6000 - 7000	27
7000 - 8000	19
8000 - 9000	16
9000 - 10,000	12

Find

- Class - width of first class
- Class - mark of second class
- Number of workers having wages less than Rs. 6,000
- Number of workers having wages more than Rs 6,000.

Q3) Attempt any four of the following :

[4 × 4 = 16]

- a) Explain the need of classification. Explain the different methods of classification.
- b) Explain the limitations of Index Numbers.
- c) Yearwise & Genderwise strength of certain college is given below :

Year	2003	2004	2005	2006	2007
Boys	1250	1500	1600	1900	2000
Girls	1000	1300	1600	1800	1900

Represent the data by multiple bar diagram.

- d) From the following data find the missing frequencies, it is given that mean is 15.3818 & total frequency is 55.

Class	9-11	11-13	13-15	15-17	17-19	19-21
Frequency	3	7	-	20	-	5

- e) Revenue department is trying to estimate the monthly amount of unpaid taxes. Suppose X denote field audit labour hours & Y denote unpaid taxes. Using last 10 months data the following summary is obtained.

$$\Sigma x = 441, \Sigma y = 272, \Sigma x^2 = 19461$$

$$\Sigma y^2 = 7428, \Sigma xy = 12,005$$

Determine the Regression line Y on X.

Q4) Attempt any four of the following :

[4 × 4 = 16]

- a) Define 'Regression'. State the situations where regression analysis is used.
- b) What is dispersion? What purpose does it serve in the study of distribution?

- c) Compute S.D. for the following data.

Marks	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
No. of students	3	7	25	20	5

- d) Calculate median for the following frequency distribution.

Marks	below 20	21-40	41-60	61-80	81-100
No. of students	1	9	32	16	7

- e) Define Index numbers & Give the comparison between Laspeyre's & Paasche's Index numbers.

- f) Draw a pie diagram to represent the following data.

Group of item	Average monthly expenses of a family (in Rs)
Food	2400
Clothing	1400
House rent	1600
Fuel & lighting	600
Miscellaneous	2000

Q5) Attempt any one of the following :

[1 × 6 = 6]

- a) The following data represents the goal scored by two teams in football matches.

Number of Goals	0	1	2	3	4
No. of matches by team A	20	12	8	3	2
No. of matches by team B	18	10	7	6	4

Which team scores more goal in average? Which team is more consistent?

- b) Following data gives expenditure incurred on Advertisement & sales for 10 years.

Expenses in Thousand	Sales is lakh
(X)	(Y)
10	5.0
12	5.1
15	5.4
14	5.5
16	5.7
20	5.9
19	6.0
24	7.3
26	7.5
30	7.8

- Find appropriate line of regression to estimate sales for given advertisement. Also estimate sales if Advertisement expenses is Rs. 35,000.
- To achieve sales target of Rs. 10 lakhs how much you need to invest in advertisement.



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F.Y. B.B.A.

(205) BUSINESS STATISTICS

(2019 Pattern) (Semester - II)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Figures to the right indicate full marks.
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- 4) Simple calculator is allowed.

Q1) A) Fill in the blanks :

[5 × 2 = 10]

- a) If $\bar{X}$ is 10 and coefficient of variation is 40%, then variance is equal to _____.
- b) _____ type cumulative frequencies are non-decreasing.
- c) The median of 10 numbers is 25. If the highest number is increased by 5, then the median will be _____.
- d) If $V(X) = 5$, then $V(3X + 2) =$ _____.
- e) Karl Pearson's correlation coefficient lies between _____.

B) State whether the following statements are True or False : [3 × 2 = 6]

- a) Two regression lines never intersect each other.
- b) Arithmetic mean can be determined graphically.
- c) Standard deviation is always non-negative.

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Q2) Attempt any four of the following : **[4 × 4 = 16]**

- a) Define mode. State its two merits and two demerits.
- b) Describe scatter diagram and explain how it is used to measure correlation.
- c) Draw histogram for the following income distribution.

Weekly income	1000-1500	1500-2000	2000-2500	2500-3000	3000-3500	3500-4000
No. of workers	80	100	150	180	140	100

- d) The following results of capital employed and profit earned by a firm in 10 successive years are calculated.

	Mean	Standard Deviation
Capital employed (₹ thousand)	55	28.7
Profit earned (₹ thousand)	13	85

Coefficient of correlation = 0.96

Estimate the amount of capital to be employed to earn profit of ₹20,000/-.

- e) Following is the data related to the frequency distribution of monthly wages of 100 workers.

Monthly wages in Rs.	4000-5000	5000-6000	6000-7000	7000-8000	8000-9000	9000-10000
No. of workers	11	15	27	19	16	12

Find :

- i) class-width of first class.
- ii) class mark of second class.
- iii) number of workers having wages less than Rs. 6,000/-
- iv) number of workers having wages more than Rs. 6,000/-

- f) From the following data, compute an index for the year 2012 taking 2011 as base by simple average of Price Relatives method using arithmetic mean.

Commodity	2011 Price (Rs.)	2012 Price (Rs.)
A	1	5
B	2	4
C	3	3
D	4	2

Q3) Attempt any four of the following : **[4 × 4 = 16]**

- a) Define variable. Explain discrete variable and continuous variable with example.
- b) Explain the concept of index number. State uses of it.
- c) A survey revealed the following frequency distribution.

Distance travelled in km per litre of petrol (X)	40-45	45-50	50-55	55-60	60-65
No. of motor cycles (f)	10	17	23	40	10

Find : i) mean ii) mode of distance travelled per km.

- d) Calculate quartile deviation and coefficient of quartile deviation for the following data.
35, 52, 48, 69, 30, 40, 42, 38, 48, 36, 52
- e) The two regression equations are $3x - y - 5 = 0$ and $4x - 3y = 0$. Find
i) arithmetic means of X and Y.
ii) regression coefficients of X on Y and Y on X.
- f) The median for the following frequency distribution is 27 (in hundreds of Rs.).
Find missing frequencies of the data.

Expenditure (in hundreds of Rs.)	0-10	10-20	20-30	30-40	40-50	Total
Number of families	3	--	20	11	--	80

Q4) Attempt any four of the following : **[4 × 4 = 16]**

- a) Define regression. State any three properties of regression coefficients.
- b) What do you mean by Central tendency? State the requirements of good measure of Central tendency.
- c) Draw a pie diagram to represent the following information of a company during a year.

Item of cost	Rs. in crore
Labour cost	10
Overheads cost	30
Materials cost	60

- d) For a set of 90 items, the mean and standard deviation are 59 and 9 respectively. For 40 items selected from these 90 items, the mean and standard deviation are 54 and 6 respectively. Find the mean and standard deviation of remaining items.
- e) Calculate Spearman's rank correlation coefficient for the following data.

X	49	69	39	49	29
Y	59	59	59	49	39

- f) Following information relating to works in an industrial town is given.

Items for consumption	Consumer price index in 2005	Proportion of expenditure on the item
i) Food, drinks and tobacco	132	60%
ii) Clothing	154	12%
iii) Fuel and lighting	147	16%
iv) Housing	178	8%
v) Miscellaneous	158	4%

Average wage per month in the year 2000 is Rs. 2,000/-. What should be the dearness allowance expressed as percentage of wages? What should be the average wage per worker per month in 2005 in that town so that the standard of living of the workers does not fall below the 2000 level?

Q5) Attempt any one of the following :

[1 × 6 = 6]

- a) Which of the following two series A and B is more stable? Justify

A	4	4	2	3	6	8	2	0	1	-1
B	8	7	5	5	6	7	4	3	4	1

- b) From the following data, compute price index number for the current year by using
- Laspeyre's method
 - Paasche's method
 - Bowley's method

Commodity	Base Year		Current Year	
	Price (Rs.)	Quantity (Kg.)	Price (Rs.)	Quantity (Kg.)
A	1	6	5	8
B	2	7	4	7
C	3	8	3	6
D	4	9	2	5
