[5802]-205

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.*
3) *Notations and abbreviations have their usual meaning.*
4) *Simple calculator is allowed.*

Q1) A) Fill in the blanks :   **[5 × 2 = 10]**

   a) If $\overline{X}$ 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.

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

i) Laspeyre's method

ii) Paasche's method

iii) 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

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