TDC Even Semester Exam., 2019

COMMERCE

(Honours)

(4th Semester)

Course No. : BCMH–401

(Business Statistics)

Full Marks : 50
Pass Marks : 17

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **five** questions, taking **one** from each Unit

UNIT—I

1. *(a)* *(i)* Explain with example the difference between a continuous variable and a discrete variable. 3

(ii) Define primary data. Name the various methods of collecting primary data. 1+2=3

(b) What is tabulation? Write down the names of different parts of a table. 1+3=4

2. *(a)* Prepare a blank table showing the distribution of employees in two industries according to the following characteristics : 4

(i) Sex (M/F)

(ii) Marital status (married/unmarried)

(iii) Literate/Illiterate

Or

Prepare a frequency distribution table for the following observations :

Monthly salary of 30 workers (in ₹)

310	320	325	354	370	335
300	397	331	375	315	390
350	386	359	360	380	323
342	327	305	318	337	367
392	340	363	385	367	393

Find the—

(i) percentage of workers whose monthly salary is below ₹ 350;

(ii) percentage of workers whose monthly salary is or above ₹ 350. 4

(b) *(i)* Define statistics. Write down the three limitations of statistics. 1+3=4

(ii) State the advantages of sample survey method over complete enumeration. 2

UNIT—II

3. *(a)* *(i)* If $\bar{x}$ be arithmetic mean of x variate, $\bar{y}$ be arithmetic mean of y variate and the relation of the variates is $y \quad a \quad bx$, where a and b are two constants, then show that $\bar{y} \quad a \quad b\bar{x}$. 3

(ii) For a set of ungrouped values, the following results are found :

$N \quad 15, \quad x \quad 480$ and $x^2 \quad 15735$

Find mean and standard deviation. 3

(b) For a given distribution, the mean is 4·75, median is 4·72 and the standard deviation is 0·92. Find the coefficient of skewness and comment on the nature and the shape of the distribution. 4

4. *(a)* Write the empirical relationship among quartile deviation, mean deviation and standard deviation. Prove that the standard deviation calculated from two values x_1 and x_2 of a variable x is equal to half of their difference. (Assume that $x_1 \quad x_2$) 1+4=5

(b) The average marks obtained by two groups of students in an examination are 75 and 85. If the average marks of all the students is 80, find the ratio of students in the two groups. 5

Or

What do you mean by measures of central tendency or averages? Discuss briefly the methods of measuring averages. 1+4=5

UNIT—III

5. *(a)* Define correlation. Show that the coefficient of correlation lies between –1 and +1. 1+4=5

(b) Write down the two regression equations of X on Y and Y on X, from the data given below : 5

X	:	6	2	10	4	8
Y	:	9	11	5	8	7

6. *(a)* State Newton's backward interpolation formula. Mention the conditions under which this formula is valid. 4

(b) *(i)* Prove that the product of the two regression coefficients is equal to the square of the correlation coefficient. 3

(ii) The correlation coefficient and the covariance between two variables X and Y are 0·25 and 3·6 respectively. If the variance of X is 36, then find the standard deviation of Y. 3

UNIT—IV

7. *(a)* Write down three formulae for calculating index number and also write two limitations of index number. 3+2=5

(b) From the following data, find the trend values by 5 yearly moving averages : 5

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
Sales	36	43	43	34	44	54	34	24	14

8. *(a)* The following table gives the index numbers for different groups of items together with their respective weights for 2016 (base year 2015) :

Group	*Index number*	*Weight*
Food	150	55
Clothing	280	10
Light and fuel	180	7
Rent	300	10
Miscellaneous	210	18

(i) Find out the overall cost of living index number for the year 2016. 2

(ii) Suppose a person was earning ₹ 1,800 per month in 2015. What should be his salary in 2016 to maintain his same standard of living as in 2015? 2

(b) *(i)* Define time series. What are the essential requirements of a time series? 1+2=3

(ii) Write a note on method of least squares. 3

UNIT—V

9. *(a)* *(i)* Explain the mathematical definition of probability. Point out its drawback. 1+2=3

(ii) In a locality, out of 5000 people residing, 1200 are above 30 years of age and 3000 are female. Out of the 1200 who are above 30, 200 are female. Suppose after a person is chosen you are told that the person is a female. What is the probability that she is above 30 years of age? 4

Or

Two dice are thrown. Find the probability that—

(i) the total of numbers on the dice is 8;

(ii) the sum of the numbers shown by the dice is exactly 6. 4

(b) For a binomial variate X with mean = 4 and variance = 3, find $P(X$ a non-zero value). 3

10. *(a)* Assuming the probability of a male birth as $\frac{1}{2}$, find the probability that a family of 3 children will have—

(i) at least one girl;

(ii) two boys and one girl. 5

(b) Under what conditions, binomial and Poisson distributions tend to become a normal distribution? Write down two properties of normal distribution. 3+2=5

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