2022

(February)

COMMERCE

(Honours)

(Business Statistics)

(BC–301)

Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. *(a)* "Statistics are like proposals of marriage they should be, but–they are studied and considered, very deliberately, upon their all-round merits." In the light of this statement, examine the functions and limitations of statistics. 5+5=10

(b) Briefly explain the significance of tabulation in statistics. 5

Or

(a) What are the precautions to be taken while using secondary data? 6

(b) An investigation conducted by the department of education in a public library revealed the following facts. You are required to tabulate the information as neatly and clearly as you can. 9

In 2019, the total number of readers was 46000 and they borrowed some 16000 volumes. In 2020, the number of books borrowed increased by 4000 and the borrowers by 50%.

The classification was on the basis of three sections : Literature, Fiction and Illustrated News. There were 10000 and 30000 readers in the sections Literature and Fiction respectively in the year 2019. In the same year, 2000 and 10000 books were lent in the sections Illustrated News and Fiction respectively. Marked changes were seen in the year 2020. There were 7000 and 42000 readers in the sections Literature and Fiction respectively. So also 4000 and 13000 books were lent in the sections Illustrated News and Fiction respectively.

2. *(a)* Discuss the merits and demerits of geometric mean. 3+2=5

(b) An incomplete frequency distribution is given as follows :

Variable	*Frequency*	*Variable*	*Frequency*
0–10	10	40–50	?
10–20	20	50–60	25
20–30	?	60–70	15
30–40	40		
			Total 170

Given the median value is 35. Find the missing frequencies. 5+5=10

Or

(a) Distinguish between skewness and dispersion. 3

(b) Following are the marks obtained by two students in 10 tests of 100 marks each :

Tests	*Marks Obtained by A*	*Marks Obtained by B*
1	44	48
2	80	75
3	76	54
4	48	60
5	52	63
6	72	69
7	68	72
8	56	51
9	60	57
10	54	66

If the consistency of performance is the criterion for awarding in prize, who should get the prize? 12

3. *(a)* State the assumptions of Karl Pearson's coefficient of correlation. 3

(b) Find the coefficient of correlation between price and sales from the following data and interpret its value through probable error : 9+3=12

Price (₹)	*Sales* (units)	*Price* (₹)	*Sales* (units)
103	500	84	800
98	610	88	800
85	700	90	570
92	630	93	700
90	670	95	680

Or

(a) Show that Fisher's ideal index number satisfies the time reversal test. 6

(b) Construct index number of prices for the following data using Laspeyres', Paasche's and Fisher's Index : 3+3+3=9

	2019		2020	
Commodity	*Price*	*Quantity*	*Price*	*Quantity*
A	6	50	10	56
B	2	100	2	120
C	4	60	6	60
D	10	30	12	24
E	8	40	12	36

4. *(a)* Give the classical definition of probability. What are its drawbacks? 2+3=5

(b) A person is known to hit the target in 3 out of 4 shots, whereas another person is known to hit the target in 2 out of 3 shots. Find the probability of the target being hit at all when they both try. 5

(c) A problem in statistics is given to five students *A*, *B*, *C*, *D* and *E*. Their chances of solving it are $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}$ and $\frac{1}{6}$.

What is the probability that the problem will be solved? 5

Or

(a) Explain the principle of inertia of large numbers. 5

(b) What is random sampling? How can a random sample be selected? Is random sampling always better than other forms of sampling in the context of socio-economic survey? 2+3+5=10

5. *(a)* Explain briefly the components of time series. 5

(b) Assuming that trend is absent, determine if there is any seasonality in the data given below :

Year	*1st Quarter*	*2nd Quarter*	*3rd Quarter*	*4th Quarter*
2016	3·7	4·1	3·3	3·5
2017	3·7	3·9	3·6	3·6
2018	4·0	4·1	3·3	3·1
2019	3·3	4·4	4·0	4·0

What are the seasonal indices for various quarters? 10

Or

(a) Discuss the utility of interpolation for a businessman. 5

(b) Estimate the production for the years 2011 and 2015 from the following data : 5+5=10

Year	*Production* ('000 units)
2005	100
2007	120
2009	150
2011	?
2013	210
2015	?
2017	320

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