'समानो मन्त्रः समितिः समानी'

UNIVERSITY OF NORTH BENGAL

BBA Honours 5th Semester Examination, 2022

CC11-BBA (501)

BUSINESS STATISTICS

Time Allotted: 2 Hours | Full Marks: 60

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

GROUP-A

Answer any *two* questions $12\times2 = 24$

1. (a) The median and mode of the same distributions are known to be 27 and 26 respectively. Find the values of a and b. 6

Values:	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
Frequency:	3	a	20	12	b

(b) Find the coefficient of variation of the marks of Business Mathematics and Statistics, obtained by the students of a college. 6

Marks obtained:	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70
No. of students:	2	35	46	12	5

2. (a) Ten students obtained percentage of marks in College Test (X) and in Final University Examination (Y). Calculate the correlation coefficient and discuss the relation between them. 6

X:	51	63	73	46	50	60	47	36	60	44
Y:	48	70	74	42	60	66	50	30	36	34

(b) The overall percentage of failures in a certain examination is 40. What is the probability that out of a group of 6 candidates at least 4 passed the examinations? 6

3. (a) The equations of two regression lines between two variables are expressed as $2x-3y=0$ and $4y-5x-8=0$. Identify which of the two can be called regression of y on x and x on y. Also find $\bar{x}$, $\bar{y}$ and correlation coefficient r. 6

(b) Construct (i) Laspeyre's, (ii) Paasche's, (iii) Fisher's index numbers from the given data: 6

Commodities	2020		2022	
	Price	Quantity	Price	Quantity
A	175	80	192	75
B	278	100	202	125
C	245	115	256	100
D	182	210	257	235

4. (a) Construct a trend equation from the following data and make sales forecast for 2023: 6

Year:	2016	2017	2018	2019	2020	2021
Sales (**Rs. Lakh**):	94	88	77	85	56	52

(b) In a company for collection of an overdue amount 70% customers are called on personally, 20% are sent SMS and 10% are sent reminder letters. The probabilities of getting cash after the above follow up measures are 80%, 50% and 40% respectively. On a particular day the cashier received an overdue collection from a customer. What is the probability that the customer was sent an SMS? 6

GROUP-B

5. Answer any ***four*** questions from the following: 6×4 = 24

(a) Show that Fisher's Index number satisfies Factor Reversal Test as well as Time Reversal Test. 6

(b) Show that AM > GM > HM. 6

(c) Probabilities that three students X, Y and Z can solve a problem are 0.3, 0.25 and 0.20. If all of them try the problem independently, what is the probability that the problem will be solved? 6

(d) Show that correlation coefficient lies between –1 and +1. 6

(e) The manufacturing process of an article consists of two parts X and Y. The probabilities of defect in parts X and Y are 10% and 15% respectively. What is the probability that the assembled product will not have any defect? 6

(f) The following results were obtained from records of age (x) and systolic blood pressure (y) of a group of ten women: 6

	x	y
mean:	53	142
variance:	130	165

$$\sum (x-\bar{x})(y-\bar{y}) = 1220$$

Find the appropriate regression equation and use it to estimate the blood pressure of a woman whose age is 45.

GROUP-C

6. Answer any ***four*** questions from the following: 3×4 = 12

(a) The second, third and fourth central moments of a distribution are given by 140, 148 and 6030 respectively. Calculate the moment measures of skewness and kurtosis, and comment on the shape of distribution. 3

(b) Given the following results, obtain the regression equation of y on x: 3

$\bar{x} = 68,\ \bar{y} = 150,\ \sigma_x = 2.5,\ \sigma_y = 20,\ r = 0.60$

(c) What are sampling and non-sampling errors? 3

(d) Find the SD of 1, 2, 3, 4, …, 10. 3

(e) What is time series? Mention the various components of time series. 3

(f) If $\sum D^2 = 33$ and $N = 10$, find the value of the coefficient of rank correlation, where D represents the difference between the ranks of two series and N is the number of pairs of observations. 3

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