



'সমানো মন্ত্র: সমিতি: সমানী'

## UNIVERSITY OF NORTH BENGAL

BBA Honours 5th Semester Examination, 2021

### CC11-BBA

### 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.  
All symbols are of usual significance.*

#### GROUP-A

**Answer any two questions from the following**

12×2 = 24

1. (a) If  $A$  and  $B$  are two events not necessarily mutually exclusive in the sample space  $S$ , then prove  $P(A \cup B) = P(A) + P(B) - P(AB)$  4+4+4
  - (b) For a Binomial Distribution, the mean is 4 and the standard deviation is 2. Find the probability of getting (i) at least two successes, (ii) at most two successes
  - (c) In a Normal Distribution, 8% of the items are under 50 and 70% of items are above 60. Find the Mean and Standard Deviations of the distribution.  
Given  $P(1.40 \leq Z \leq \infty) = 0.08$  and  $P(1.28 \leq Z \leq \infty) = 0.30$ .
2. (a) If two regression lines are  $2Y - X - 50 = 0$  and  $3Y - 2X - 10 = 0$ , what is the value of correlation coefficient between  $X$  and  $Y$ ? Also estimate the value of  $Y$  when  $X = 10$ . 6+6
  - (b) Prove that  $-1.0 \leq r \leq +1$
3. (a) Define Time Series. Name the different components of Time Series. 2+3
  - (b) Fit a straight line trend by the least square method to the following figures of production of a sugar factory: 7

| Year | Production ('000 tons) |
|------|------------------------|
| 1969 | 76                     |
| 1970 | 87                     |
| 1971 | 95                     |
| 1972 | 81                     |
| 1973 | 91                     |
| 1974 | 96                     |
| 1975 | 90                     |

Estimate the production for 1976.

4. (a) What are the desirable properties of a satisfactory measure of dispersion? 6  
 (b) An analysis of monthly wages paid to workers in two firms A and B, belonging to the same industry, gives the following results: 2+2+2

|                              | Firm A          | Firm B           |
|------------------------------|-----------------|------------------|
| Number of wage earners       | 550             | 650              |
| Average monthly wages        | Rs. 50          | Rs. 45           |
| S.D of distribution of Wages | Rs. $\sqrt{90}$ | Rs. $\sqrt{120}$ |

- (i) Which firm A or B pays out higher amount as monthly wages?  
 (ii) In which firm A or B is there greater variability in individual wages?  
 (iii) What are the measures of average monthly wages and standard deviation in the distribution of individual wages of all workers if two firms taken together.

**GROUP-B**

**Answer any four questions from the following**

6×4 = 24

5. (a) The probability that a contractor will get a plumbing contract is  $\frac{2}{3}$  and the probability that he will not get an electric contract is  $\frac{5}{9}$ . If the probability of getting at least one contract is  $\frac{4}{5}$ , what is the probability that he will get both the contracts? 6  
 (b) From the following group index numbers and group weights, calculate the cost of living index number: 6

| Group         | Index No. | Weight |
|---------------|-----------|--------|
| Food          | 428       | 45     |
| Clothing      | 240       | 15     |
| Fuel & Light  | 200       | 8      |
| House Rent    | 125       | 20     |
| Miscellaneous | 170       | 12     |

- (c) You are given the following data: 6

|      | X  | Y  |
|------|----|----|
| A.M  | 36 | 85 |
| S.D. | 11 | 8  |

If correlation coefficient between X and Y is 0.66, find the two regression equations.

- (d) Construct Fisher's ideal index numbers for the following data: 6

| Commodities | 2019 | 2019  | 2020 | 2020  |
|-------------|------|-------|------|-------|
|             | Qty  | value | Qty  | value |
| A           | 20   | 240   | 30   | 420   |
| B           | 13   | 130   | 15   | 300   |
| C           | 12   | 120   | 20   | 300   |
| D           | 8    | 48    | 10   | 40    |

- (e) A company is trying to secure two contracts A and B. The probability that the company will get contract A is  $\frac{3}{5}$ , and that for B is  $\frac{1}{3}$ . The probability that the company will get both contracts is  $\frac{1}{8}$ . What is the probability that the company will get contract A or B? 6
- (f) The coefficient of variation of wages of male workers and female workers are 55 and 70 percent respectively, while the standard deviations are 22.0 and 15.4 respectively. Calculate the overall average wages of all workers given that 80 percent of the workers are male. 6

**GROUP-C**

**Answer any *four* questions from the following**

3×4 = 12

6. (a) If the coefficient of variation is 40% and the means is 30, find the standard deviation.
- (b) In a moderately skewed distribution, the mean and median are 25.6 and 26.1 respectively, what is the mode of the distribution?
- (c) Explain at least one use of the regression line with an example.
- (d) Enumerate the uses of 'cost of living' index.
- (e) Distinguish between correlation and regression.
- (f) The rates of interest earned on three different investments are 10%, 12% and 15% respectively. If the amount of each investment is the same, what is the average interest on the total sum invested?

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