International Islamic University Chittagong
Department of Economics & Banking
Semester End Examination
Program: BSS (Hons.) in E&B
Semester: Autumn-2023

Course Title: Elementary Statistics **Time: 2.5 Hours**
Course Code: STAT-1201 **Full Marks: 50**

[NB: Answer the following questions. All parts of a question must be answered serially. Figures in the right margin indicate full marks.]

QN	Description of Question	Marks	CLOs & PLOs	Cognitive Learning
1(a)	State the desirable properties of a good measure of dispersion?	03	CLO-2 PLO-3	Understanding
1(b)	The frequency distribution given below gives the number of hours worked per month by randomly selected 50 workers of a factory: Find (i) Mean and (ii) Standard deviation.	07		Evaluating

Number of hours worked per month	120-130	130-140	140-150	150-160	160-170	170-180	180-190
Number of workers	3	4	6	9	12	11	5

2		10	CLO-2 PLO-3	Applying

Particulars regarding the income of two factories are given below:

	Factory A	Factory B
Number of Employees	400	300
Average Income	1250	1350
Standard Deviation of income	80	61

i. In which factory is the variation in income greater?
ii. Which factory does show more consistency in the distribution of income?
iii. What is the combined standard deviation and combined mean of the factory A and B put together?
iv. A person got job in both the factories, which factory will he prefer to join?

3(a)	The arithmetic mean, mode and standard deviation of a distribution are 47.70, 46.67 and 18.29. Compute skewness and comment on the distribution.	03	CLO-2 PLO-3	Evaluating
3(b)	The frequency distribution refers to the profits of randomly selected companies of a country:	07	CLO-2 PLO-3	Evaluating

Profits (in lakhs Tk.)	Number of Companies
70-89	8
90-109	11
110-129	18
130-149	9
150-169	4

Calculate Bowley's coefficient of skewness and comment.

OR

3(a)	The first four central moments are 0, 19.28, 77.05 and 1202.19 respectively, find $\beta 1$ and $\beta 2$ and Comment on the shape characteristics of the distribution.	03	CLO-2 PLO-3	Evaluating
3(b)	The frequency distribution refers to the profits of randomly selected companies of a country:	07	CLO-2 PLO-3	Evaluating

Profits (in lakhs Tk.)	Number of Companies
70-89	8
90-109	11
110-129	18
130-149	9
150-169	4

Compute first four central moments.

4(a) What is Fisher's Ideal Index? Why is it called Ideal Index? 03 CLO-3 PLO-4 Understanding /Analyzing

4(b) The following data refer to the prices of some essential commodities for the years 2020 and 2022. Compute price index of the year 2022 taking 2020 as a base year by using Laspeyer's, Paasche's, and Fisher's methods. 07 CLO-3 PLO-4 Applying

Commodity and unit	Price (in taka) 2020	Quantity 2020	Price (in taka) 2022	Quantity 2022
Rice (kg)	32	32	40	25
Oil (litre)	75	4	90	3
Dal (kg)	60	2	78	1.5
Milk (litre)	35	20	44	15
Meat (kg)	200	10	240	7
Vegetable (kg)	12	22	15	20

Or

4(a) Describe the main problems for the construction of an index number. 03 CLO-3 PLO-4 Understanding

4(b) Prices per unit of the items forming consumption bundle of an average middle-class family in two periods and percentages of total budget allocated to those items are given in the following table. Compute an appropriate index number and comment on the result. 07 CLO-3 PLO-4 Applying

Category	Food	Rent	Clothing	Fuel	Misc
Percent expenditure	35	15	20	10	20
Price in base year	1500	500	1000	200	600
Price in current year	1740	600	1250	250	900

5(a) Distinguish between chance causes and assignable causes of variations. 03 Understanding

5(b) A company manufactures a product that is packed in one kg tins; it utilizes automatic filling equipment. It takes a sample of 5 cans every two hours and measures the filling in each of the 5 cans. The table gives the measurements of filling (grams) in the last 5 samples. Set up control charts for mean and range and state whether the process is under control or not. (Given A2 = 0.58, D3 = 0, D4 = 2.115) 07 Analyzing

Sample No.	Individual Measurements				
	1	2	3	4	5
1	1001	1002	1000	998	999
2	999	998	1001	998	999
3	995	1002	1003	1001	1002
4	1000	1001	999	998	1302
5	994	996	996	1000	999