International Islamic University Chittagong
Department of Economics & Banking
Mid-Term Examination
Program: BSS(Hons.) in E&B
Semester: Spring-2024

Course Title: Statistics for Economists **Time: 1.5 Hours**
Course Code: STAT-3503 **Full Marks: 30**

[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)	What is statistical inference? Mention the criteria of a good estimator. Illustrate 95% confidence interval for population proportion.	3	CLO-2 PLO-1	Understanding
1(b)	The director of an electronics company seeks to estimate the average expenditure of clients on electrical appliances. An inquiry was conducted on a randomly selected group of 50 clients, revealing that the mean spend was Tk 40 thousand, with a standard deviation of 12.5 thousand. Determine a 98% confidence interval for the actual average spending. If the director finds the confidence interval to be excessively big, he wants to determine the minimum sample size needed to achieve a 98% confidence interval with a maximum total width of 3 thousand. Determine the minimum sample size that will fulfil this requirement.	7		Evaluating
2(a)	You are given the following information relating to the purchase of bulbs from two manufacturers, A and B: Manufacturer — No. of Bulbs bought — Mean Life — Standard deviation A — 120 — 2850 hrs. — 90 hrs. B — 110 — 2770 hrs. — 80 hrs. Construct a 99% confidence interval for the difference between the two mean lives of two makes of bulbs.	5	CLO-2 PLO-1	Creating
2(b)	The management wants to ascertain the proportion of the company's employees who support an altered bonus scheme. Out of a randomly selected group of 344 employees, it was discovered that 261 individuals expressed support for this specific strategy. Determine a 95% confidence interval to assess the population proportion supporting this revised proposal.	5		Creating/ Evaluating
3(a)	Discuss the importance of stratification in conducting a sample survey. Discuss the concept of equal allocation about stratified random sampling.	3	CLO-1 PLO-1	Remembering/ Understanding
3(b)	The following data refers to the revenue (Million Tk.) of 50 companies and it is classified into three grouped according to revenue: Group-I: 36, 34, 37, 38, 32, 31,47, 41, 42, 39, 38, 44,46,40,48,36, 39,41, 47, 40, 32, 43. Group-II: 49, 57, 58, 51, 52, 57, 59, 60, 59,61,63,52, 51,56, 52, 54,49. Group-III: 67, 64, 55, 68, 69, 63, 61, 63, 63, 62,69. (i) Draw an appropriate random sample of size 10. (ii) Estimate average revenue of the companies. (iii) Find the standard error of the estimate and comment.	7		Evaluating
	OR			
3(a)	Explain the procedure of conducting systematic sampling. How does it differ from simple random sampling?	3	CLO-1 PLO-1	Remembering/ Understanding
3(b)	A survey was conducted with 50 students in a particular area to gather information about their daily expenses. Here is a breakdown of the students' daily expenses in Taka: 500,300, 501, 602, 389, 487, 560, 480, 427, 450, 426, 338, 377, 366, 335, 280, 480, 351, 342, 440, 425, 331, 455, 427, 505, 678, 404, 451, 411, 450, 309, 451, 301, 339, 891, 401, 314, 242, 340, 242, 430, 444, 365, 327, 332. (i) Draw a systematic random sample of size 10. (ii) Estimate average daily expenditure and its standard error and comment.	7		Evaluating