

Daffodil International University

Faculty of Business & Entrepreneurship

Department of Business Administration

Program: BBA

Examination: Final-term

Full Marks: 40

Course Title: Applied Statistics

Teachers' Initial: AA

Semester: Fall-2025

Time: 2 Hours

Course Code: STA-202

Section: Retake-A

Answer the followings questions:

1. a) Show the six-step procedure for testing a hypothesis. [CLO1, L1] [3]
b) List the types of sampling method. [CLO1, L1] [3]
c) Define Normal Probability Distribution with example. [CLO1, L1] [2]

2. a) Solve the following probabilities for the standard normal curve. [CLO3, L3] [4]

i) $P(-1.56 < z < 2.31)$ ii) $P(z > -1.86)$

- b) Frost Wave Beverages produces several soft drinks, including Orange-cola. The filling machine is set to release 12 ounces into each can, but the actual amount varies slightly. The amount of soda per can is normally distributed with a mean of 12 ounces and a standard deviation of 0.015 ounce. Identify the probability that a randomly selected can contains between 11.97 and 11.99 ounces. [CLO3, L3] [4]

3. Aqua Pure Bottling Company wanted to examine how investment in packaging design campaigns affected monthly sales. The company recorded the following four-month data: [CLO3, L3]

Month	Packaging Design Cost (Tk. Million)	Sales Revenue (Tk. Million)
August	2	7
September	1	3
October	3	8
November	4	10

- a) Choose the regression equation. [4]
b) Interpret the values of a and b. [2]
c) Identify the sales when Tk. 4 million is spent on packaging design. [2]

4. The manufacturer of a certain brand of auto batteries claims that the mean life of these batteries is 45 months. A consumer protection agency that wants to check this claim took a random sample of 24 such batteries and found that the mean life for this sample is 43.05 months. The lives of all such batteries have a normal distribution with the population standard deviation of 4.5 months. Examine the p -value for the test of hypothesis with the alternative hypothesis that the mean life of these batteries is less than 45 months and conclude the result at the level of significance $\alpha = 0.025$. [CLO4, L4] [5]

5. The management of a local car dealership wants to analyze its daily sales patterns. Based on past records, they prepared the following table showing the probability distribution of the number of cars sold on a typical day. [4]

Number of cars sold	0	1	2	3	4
Probability	0.1	0.2	0.3	0.3	0.1

Solve the value of the mean and standard deviation for this probability distribution. [CLO3, L3]

6. a) Five percent of all DVD players manufactured by a large electronics company are defective. A quality control inspector randomly selects three DVD players from the production line. Identify the probability that exactly one of these three DVD players is defective. [CLO3, L3] [3]
- b) A washing machine in a laundromat breaks down an average of three times per month. Using the Poisson probability distribution formula, select the probability that during the next month this machine will have: [CLO3, L3] [4]
- (i) Exactly two breakdowns.
 - (ii) At most one breakdown.