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Daffodil International University

Department of Electrical and Electronic Engineering

Faculty of Engineering

Midterm Examination, Summer – 2026

Course Code: 0542 221 | Course Title: Probability and Statistics

Section: A,B,C,D,E,F,G | Level-Term: L2-T1 | Teacher's Initial: JA, TRS, IJM

Full Marks: 25 | Exam Date: June 29, 2026 | Time: 1.5 Hours

*** ***Answer the Following questions sequentially.***

[The second right most column indicates the course outcomes(COs) with respective Bloom's level and the right most column indicates the allocated marks.]

Q1. An electrical engineering laboratory is studying the performance of 120 induction motors used in an industrial plant. Due to time and budget constraints, they randomly select 25 motors for analysis. For each motor, they record: Power consumption (kW), Motor speed (RPM), Motor condition — **CO-1** **C(2)** **5**

i) From the scenario above, **identify** population, sample, and variables "type" and "level of measurements".

ii) **Compare** population and sample with suitable examples.

iii) **Explain** measure of central tendency. Classify different types of central tendency.

Q2. An Electrical Engineering student is analyzing the current consumption (in mA) of 20 electronic sensors used in a smart monitoring system. The recorded current values are: — **CO-3** **C(3)** **8**

12, 18, 25, 30, 22, 35, 40, 28, 15, 32, 45, 50, 38, 27, 20, 42, 54, 48, 33, 24

i) **Construct** a frequency distribution table using an appropriate class interval.

ii) **Illustrate** any two suitable graphs for the above data.

iii) **Calculate** the percentage of sensors having current consumption less than or equal to 35 mA.

Q3. A laboratory investigates the power losses (in watts) of two transformer designs under similar loading conditions. — **CO-3** **C(3)** **12**

Transformer X	18	20	19	21	25
Transformer Y	12	25	28	30	35

i) **Calculate** the coefficient of skewness for each transformer design and interpret the results.

ii) **Calculate** the coefficient of kurtosis for each transformer design and interpret the results.

iii) Based on the skewness and kurtosis values, **Illustrate** the shape of each distribution and compare its peakness with a normal distribution.