CONFIDENTIAL

OPEN BOOK ASSESSMENT
MARCH SEMESTER 2021

INTRODUCTION TO STATISTICS
(STAT1000)

(TIME: 2 HOURS)

MATRIC NO. : | | | | | | | | | |

IC. / PASSPORT NO. : | | | | | | | | | | | | | | |

LECTURER : **SHANTA RAYAMAJHI BASNET**

GENERAL INSTRUCTIONS

1. This question booklet consists of 5 printed pages including this page.
2. Answer **ALL questions** in the **ANSWER BOOKLET**.
3. **Please refer to following format while answering the Questions:**
   a. **Answers should be in Font: Times New Roman and Font size: 12.**
   b. **Write the Question number clearly.**
   c. **Start new answer on a Fresh Page.**

CONFIDENTIAL

INSTRUCTIONS: **TIME:** ***2 HOURS***

SECTION A **(40 MARKS)**

There are FIVE (5) questions in this section. Answer ALL Questions in the ANSWER BOOKLET.

1. The following table shows the body mass (kg) of 40 students in a college:

Body mass	30-40	40-50	50-60	60-70
No. of students	5	X	16	Y

   a. Find the value of x if the degree of a pie-chart for second class is 108 degree.

(2 marks)

   b. Obtain y and the relative frequency of the fourth lass.

(2 marks)

   c. Draw a pie-chart to represent the above data.

(3 marks)
(CLO1:PLO1:C3)

2. The owner of a restaurant that serves continental food wants to study characteristics of his customers. He decides to focus on two variables: the amount of money spent by customers and whether customers order dessert. The results from sample of 25 customers are as follows:
   - Amount spent: $\bar{X}$ = \$9.7, S = \$4.5
   - 12 customers purchased dessert.

   a. Construct a 95% confidence interval estimate of population mean amount spent her customer in the restaurant.

(4 marks)

   b. The owner of competing restaurant wants to conduct a similar survey in her restaurant. This owner doesn't have access to the information of the owner of the first restaurant. Answer the following question: What sample size is needed to have 95% confidence of the estimating the population mean amount spent in her restaurant to within $\pm$ \$1.50 assuming that the standard deviation is estimated to be \$ 4?

(4 marks)
(CLO3:PLO6:C3)

3. You are the manager of a restaurant that delivers pizza to college dormitory rooms. You have just changed your delivery process in an effort to reduce the mean time between the order and completion of delivery from the current 25 minutes. A sample of 36 orders using the new delivery process yields a sample mean of 22.4 minutes and standard deviation of 6 minutes.

   Using the five steps critical value approach, at the 5% level of significance, is there evidence that the population mean delivery time has been reduced below the previous population mean value of 25 minutes.

   (7 marks)
   (CLO3:PLO6:C5)

4. Following are the marks secured by Mr.A and Mr.B in 10 tests of 50 marks each:

Test	1	2	3	4	5	6	7	8	9	10
Marks Secured by A	24	37	27	30	31	34	36	26	29	33
Marks Secured by B	22	40	35	24	26	36	34	28	30	27

   a. If the consistency of performance is the criteria for awarding a prize. Who should be awarded by the prize?

      (5 marks)

   b. Who is better?

      (2 marks)

   c. Who is more intelligent?

      (3 marks)
      (CLO1:PLO1: C3)

5.

A. According to the data from American Medical Association 15 % of US are left handed.

   a. If 4 people are randomly selected,
      i. What is the probability that they are all left- handed?

(1.5 marks)

      ii. What is the probability that at least one of them is left handed?

(1.5 marks)

   b. If groups of 50 people are randomly selected
      i. What is the mean and standard deviation number of left-handed people in such group?

(2 marks)

B. The quality control manager of certain company is inspecting batch of chocolate chip cookies that have just been baked. If the production process is in control, the average number of chip parts per cookies is 6. What is the probability that in any particular cookies being inspected,

   a. At most three chip parts will be found?

(1.5 marks)

   b. None of the chip parts will be found?

(1.5 marks)
(CLO2:PLO4:C3)

SECTION B **(20 MARKS)**

There are ONE (1) questions in this section. Answer the Questions in the ANSWER BOOKLET.

1. The table shows the information on CGPA and starting salaries (thousand) of seven recent university graduates.

CGPA	2.90	3.81	3.22	2.42	3.94	2.05	2.35
Starting Salary	28	38	25	35	40	25	28

   a. Determine the independent variable and dependent variable for the above data. Do you expect a positive or negative relation between these two variables?

   (2 marks)

   b. Find the correlation coefficient for the given data.

   (7 marks)

   c. Calculate the coefficient of determination. Interpret your answer.

   (3 marks)

   d. Find the equation of the regression line for the data.

   (4 marks)

   e. Use the regression equation to predicate the value of starting salary when CGPA is 3.67. If the CGPA is not meaningful to predicate the value of starting salary, explain your answer.

   (4 marks)
   (CLO3:PLO6:C3)

***** END OF QUESTIONS *****