SLIATE
SRI LANKA INSTITUTE OF ADVANCED TECHNOLOGICAL EDUCATION
(Established in the Ministry of Higher Education, vide in Act No. 29 of 1995)

Higher National Diploma in Information Technology
Second Year, First Semester Examination – 2023
HNDIT3072 – Statistics for IT

Instructions for Candidates:
Answer any five (05) questions.
Every question carries 20 marks
You are allowed to use non-programable calculator.

No. of questions : 06
No. of pages : 04
Time : Three (03) hours

Question 01.

(i). Define the following terms;

(a). Experiment

(b). Event

(c). Mutually exclusive events

(d). Sample space **(4 marks)**

(ii). A bag contains 5 red balls, 3 blue balls and 2 green balls.

(a). What is the sample space of this experiment? **(2 marks)**

(b). If a ball is picked randomly from the bag, what are the probabilities of selecting each type of balls. (red, blue, green)? **(2 marks)**

(c). What is the probability of getting either a red ball or green ball? **(2 marks)**

(d). If two balls are picked randomly from the bag without replacement, what is the probability of selecting one red ball and one blue ball? **(2 marks)**

(iii). In a group of 150 employees at a company, the probability of selecting a male employee is 0.6. Additionally, 45 employees (both male and female) have received a leadership award.

(a). What is the probability of selecting a female employee? Show your work using a probability rule. **(2 marks)**

(b). What is the probability of selecting an employee who has not received a leadership award? **(2 marks)**

(c). If the probability of selecting a male employee who received a leadership award is 0.18, find the probability of the selected employee having received a leadership award given that they are male. **(4 marks)**

[20 Marks]

Question 02.

(i). Define "discrete probability distribution" **(2 marks)**

(ii). Differentiate between the Binomial and the Poison probability distribution. **(2 marks)**

(iii). Consider the following probability distribution (by considering number of heads tossing three coins together).

Heads (x)	0	1	2	3
P (X)	$\frac{1}{8}$	$\frac{3}{8}$	a	$\frac{1}{8}$

For the above find;

(a). the value a. **(4 marks)**

(b). the expected value. **(4 marks)**

(iv). A biased coin has a probability of 0.4 of getting the head and toss the coin 3 times. Using Binomial probability distribution, find;

(a). the probability of getting exactly 3 heads. **(4 marks)**

(b). the expected value and the variance **(4 marks)**

[20 Marks]

Question 03.

(i). Differentiate between Primary data and Secondary data. **(4 marks)**

(ii). Explain the importance of sampling and list out two methods of probabilistic sampling. **(4 marks)**

(iii). Sample of 25 employes shows their monthly salaries (in Rs. 000) as follows:

35 40 50 45 30 60 65 55 70 35
80 85 70 40 50 45 90 100 95 50
55 60 35 40 45

(a). Construct a frequency distribution with a class width of 10 and starting at 30. **(4 marks)**

(b). Draw a histogram and a frequency polygon for the data above part(a). **(4 marks)**

(iv). Provide short answers for the followings.

(a). How do you identify the modal class from a histogram? **(2 marks)**

(b). What does a *Histogram* represent? **(2 marks)**

[20 Marks]

Question 04.

(i).

(a). Define the terms the median and the mode. **(2 marks)**

(b). Explain the importance of central tendency measurements in statistics. **(2 marks)**

(ii). The number of books read by students during their vacation are as follows;

10, 12, 5, 2, 82, 10, 8, 4, 5, 6

(a). Calculate the mean and median for the above **(2 marks)**

(b). Find the mode **(1 mark)**

(c). Briefly explain the effect of the value 82 in the above dataset have on the average value. **(1 mark)**

(iii). Number of hours worked by 100 workers per month are as follows;

Worked hours	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80	80 – 90
No. of workers	5	15	20	30	20	10

For the above information

(a). Calculate the average **(4 marks)**

(b). What is the median? **(4 marks)**

(c). Calculate the most frequent number of hours (mode) worked by workers. **(4 marks)**

[20 Marks]

Question 05.

(i).

(a). Define the variance and the standard deviation. **(2 marks)**

(b). Why are the variance and SD important in data analysis? **(2 marks)**

(ii). "Mean is always a good statistic measure in every statistical analysis". Do you agree with the statement? Justify your answer. **(4 marks)**

(iii). The ages of a few of staff in a company are as follows;

25 30 35 40 45 50 55 60

For the above calculate;

(a). the inter quartile range. **(4 marks)**

(b). the variance of the ages of staff. **(4 marks)**

(c). the standard deviation of the ages of staff. **(2 marks)**

(d). the co-efficient of variance. **(2 marks)**

[20 Marks]

Question 06.

(i).

(a). Define the term "correlation". **(2 marks)**

(b). Differentiate between positive correlation and negative correlation. **(2 marks)**

(c). Provide an example of a dependent variable and independent variable within a selected context. **(2 marks)**

(ii). The following data shows the number of hours studied (x) and marks obtained (y) by students:

Hours Studied (x)	Marks Obtained (y)
2	30
3	40
4	50
5	70
6	80

Considering the provided information;

(a). Draw a scatter plot and identify the type of correlation. **(4 marks)**

(b). Calculate the correlation coefficient. **(5 marks)**

(c). Find the regression line. **(5 marks)**

[20 Marks]