United International University
Department of Computer Science and Engineering
Mid Examination   Trimester- Fall – 2024
Course: Math -2205 (Probability and Statistics)
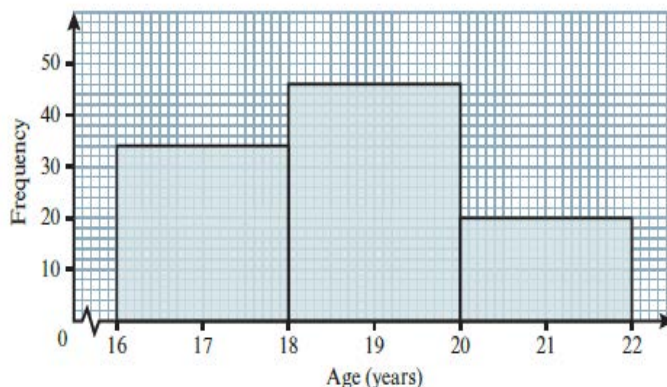Total marks - 30; Duration – 1 hour 30 Minutes

Q1   A health researcher wants to study the relationship between the number of hours spent exercising per week and the cholesterol level of adults. A random sample of 8 individuals provides the following data:

Hours Exercise (x)	1	2	3	4	5	6	7	8
Cholesterol level (y)	2.4	2.2	2	1.95	1.90	1.80	1.75	1.70

(a) Find the Correlation Coefficient (r) and interpret the result. **[4]**

(b) Calculate r^2 and interpret it in the context of the study. **[1]**

(c) Determine the equation of the regression line in the form y = a + bx, where a and b are constant to be found. Explain the meaning of the slope b in the context of this scenario.**[4]**

(d) Use the regression equation to predict the cholesterol level for someone who exercises 10 hours per week. **[1]**

Q2

(a) The histogram represents the frequency distribution of individuals within different age groups, ranging from 16 years to 22 years. The x-axis represents the age groups, while the y-axis represents the frequency of individuals in each group.
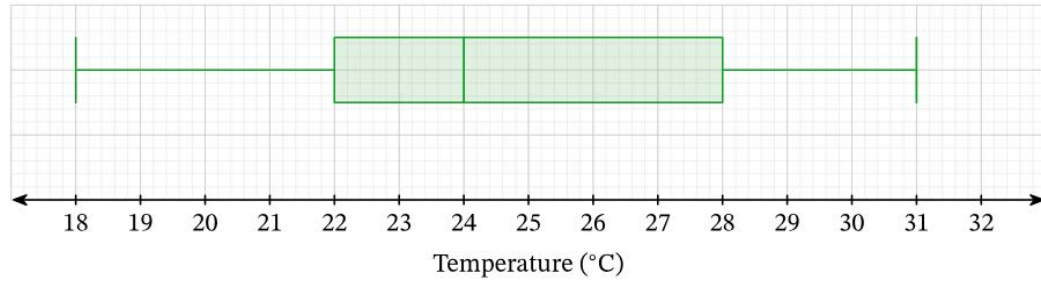

(i) What is the total frequency of the data represented in the histogram **[1]**

(ii) What is the total number of individuals aged 19 and 21 combined? . **[1]**

(iii) Calculate the percentage of individuals in the age group 16–17**[1]**

(iv) Give one disadvantage of using histogram. **[1]**

(b) A teacher recorded the quiz marks of 8 students as:

11   13   15   15   17   18   19   20.
He later realized that there was a typing error, so he changed the marks of 11 to 1. Discuss the effect on mode, mean and median of the students' marks. **[2]**

(c) The following table shows the number of **pet** owned by each of 20 families. Find the standard deviation and coefficient of variation (CV) . **[4]**
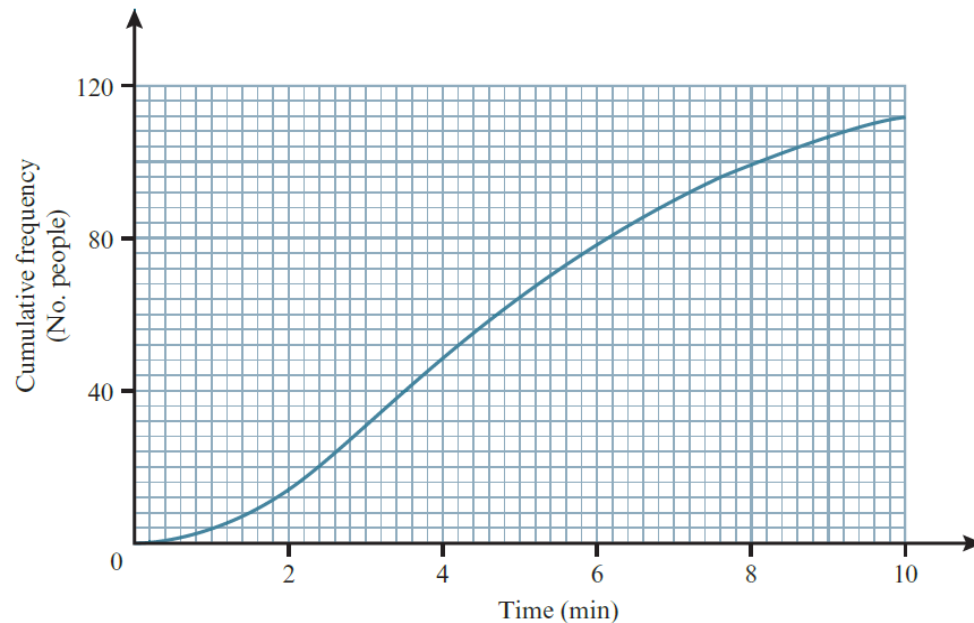
No of Pets	0	1	2	3	4	5
Number of Fm.	3	4	2	6	2	3

3

The boxplot shows the daily temperatures at a seaside resort during the month of August.

Temperature (°C)

(a) Find the range and inter quartile range. Also comment about the nature of the distribution. **[3]**

(b) The following graph illustrates the times taken by 112 people to complete a puzzle.

Time (min)

(i)   Estimate what percentage of people took more than 8 minutes to complete.**[3]**

(ii)   Find, to an approximate degree of accuracy, an estimate of 70th Percentile. **[1]**

(c)

Girls (12)		Boys (13)	Key: 1	8	2	This back-to-back stem and leaf diagram
4 1	8	2	represents			shows the percentage scores of the 25
8 6 6	8	5 9	81% for a			students who were the top performers in the
3 2 1 0	9	0 1 3 3 4 4	girl and 82%			examination.
8 7 7	9	5 6 6 9	for a boy			Identify any possible outliers. **[3]**

Formulae: