FACULTY OF SCIENCE AND TECHNOLOGY

END OF SEMESTER EXAMINATIONS - APRIL 2025

PROGRAMME: BIT

YEAR/SEM: YEAR 1/SEMESTER 2

COURSE CODE: BIT1208

NAME: BASIC STATISTICS

DATE: 2025-04-24

TIME: 9:00AM-12:00PM

INSTRUCTIONS TO CANDIDATES:

1. Read the instructions very carefully

2. The time allowed for this examination is STRICTLY three hours

3. Read each question carefully before you attempt and allocate your time equally between all the Sections

4. Write clearly and legibly. Illegible handwriting cannot be marked

5. Number the questions you have attempted

6. Use of appropriate workplace examples to illustrate your answers will earn you bonus marks

7. Any examination malpractice detected will lead to automatic disqualification.

DO NOT WRITE ANYTHING ON THE QUESTION PAPER

Section A Attempt all (40 Marks, Write the correct alternative in the booklet provided)

Question 1:

1. The average height of students in a class is an example of a: (02 Marks)
   - A) Continuous variable
   - B) Discrete variable
   - C) Parameter
   - D) Sampling unit

2. A researcher collects data on the ages of all employees in a company. This entire group of employees is an example of a: (02 Marks)
   - A) Population
   - B) Parameter
   - C) Statistic
   - D) Sample

3. The number of goals scored by a football team in a season is an example of a: (02 Marks)
   - A) Discrete variable
   - B) Continuous variable
   - C) Categorical variable
   - D) Ordinal variable

4. The standard deviation of a distribution measures: (02 Marks)
   - A) The spread of the data
   - B) The central tendency of the data
   - C) The average of the data
   - D) The variance of the data

5. Descriptive statistics is concerned with: (02 Marks)
   - A) Drawing conclusions about a population
   - B) Summarizing and describing data
   - C) Inferring relationships between variables
   - D) Testing hypotheses

6. The probability of rolling a 6 on a fair six-sided die is: (02 Marks)
   - A) ½
   - B) 1/6

C) 1

D) 1/3

7. A distribution of scores that is higher on the left side and lower on the right side is: (02 Marks)

    A) Leptokurtic

    B) Negatively skewed

    C) Positively skewed

    D) Mesokurtic

8. Calculate the mean for the following set of scores: 12, 15, 18, 21, 24. (02 Marks)

    A) 18

    B) 20

    C) 19

    D) 21

9. Calculate the median for the following set of scores: 10, 12, 15, 17, 20. (02 Marks)

    A) 12

    B) 17

    C) 15

    D) 20

10. Calculate the variance for the following set of scores: 5, 7, 8, 10, 12. (02 Marks)

    A) 6

    B) 8

    C) 7

    D) 9

11. Data that are bell-shaped and symmetrical are: (02 Marks)

    A) Skewed

    B) Asymmetrical

    C) Normal

    D) Bimodal

1. Give that A and B are independent events such that P(A)=0.2 and P(B=0.3), then P (A and B) is given by (02 Marks)

    A) 0.2

    B) 0.3

    C) 0.6

    D) 0.5

13. If a test has a mean of 60 and a standard deviation of 10, what is the z-score for a score of 75? (02 Marks)

    A) 1.5

    B) 0.5

    C) 1.0

    D) 2.5

14. The median is: (02 Marks)

    A) The most frequently occurring score in a data set

    B) The difference between the maximum and minimum scores

    C) The average of the scores

    D) The middle score when scores are ranked

15. The best graph to show the frequency of ages in a population would be a: (02 Marks)

    A) Scatterplot

    B) Box plot

    C) Bar chart

    D) Histogram

1. Given that A and B are mutually exclusive events with P(A)=0.2 and P(B)=0.3, then P(A or B) is given by (02 Marks)

    A) 0.2

    B) 0.5

    C) 0.3

    D) 0.6

17. A scatterplot displays: (02 Marks)

    A) The relationship between two variables

    B) A distribution of scores

    C) The spread of data

    D) A histogram

18. A Pearson correlation coefficient of r = -0.7 indicates: (02 Marks)

    A) A strong negative relationship

    B) A strong positive relationship

    C) A weak positive relationship

    D) No relationship

19. In a linear regression equation, Y = a + bX, what does b represent? (02 Marks)

A) The slope of the line

B) The intercept

C) The correlation coefficient

D) The value of X

20.   The Laspeyres index number is based on: (02 Marks)

A) Base Year Quantity

B) Current Year Quantity

C) Average of Base and Current Year Quantity

D) None of the above

Section B Attempt any four (60 Marks)

Question 1:

Calculate the correlation coefficient of the following data and comment on your result: (15 Marks)

X	10	20	30	40
Y	5	10	15	20

Question 2:

A student has a success rate of 0.20 in solving a particular type of math problem. If he attempts 8 problems, calculate the following:

(i)   Mean number of successful problems solved (03 Marks)

(ii)   Variance and standard deviation of the number of successful problems solved (04 Marks)

(iii)   Probability that he solves exactly 4 problems successfully (04 Marks)

(iv)   Probability that he solves at most 3 problems successfully (04 Marks)

Question 3:

Compute both the Laspeyres and Paasche index numbers for the current year using the following data. (15 Marks)

Item	Base Year Quantity (Q_base)	Current Year Quantity (Q_current)	Base Year Price (P_base)
Goods A	100 units	120 units	$2 per unit
Goods B	150 units	160 units	$3 per unit
Goods C	200 units	210 units	$5 per unit

Question 4:

The probability of winning a game is 4/5. If ten games are played, what is the

(i)   Mean number of successes (03 Marks)

(ii)   Variance and standard deviation (04 Marks)

(iii)   Probability of at least 8 successes in the ten games (04 Marks)

(iv)   Probability of at most 3 successes. (04 Marks)

Question 5:

A company has the following data on its sales during the last year in each of its regions and the corresponding number of salespersons employed during this time:

Region	Sales (units)	Salespersons
A	236	11
B	234	12
C	298	18
D	250	15
E	246	13
F	202	10

(i)   Develop a regression model for the data. (08 Marks)

(ii)   forecast the number of sales that would be expected next year in regions that employed (a) 14 salespersons; and (b) 25 salespersons. (07 Marks)

Question 6:

From the following data compute Laspeyre's and Paasche's index numbers for the current year: (15 marks)

Commodity		A	B	C	D
Base Year Price	(p_0)	10	25	30	15
Curreny Year Price	(p_1)	15	40	45	30
Base Year Quantity	(q_0)	6	10	15	20
Current Year Quantity	(q_1)	8	20	12	15