Candidate's Index Number
Signature:

UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
SCHOOL OF EDUCATIONAL DEVELOPMENT AND OUTREACH
INSTITUTE OF EDUCATION

COLLEGES OF EDUCATION
FOUR-YEAR BACHELOR OF EDUCATION (B.ED)
THIRD YEAR, END-OF-SECOND SEMESTER EXAMINATION, APRIL 2023

27TH APRIL 2023   STATISTICS AND PROBABILITY I   4:00 PM – 4:40 PM

This paper consists of two sections, A and B. Answer ALL the questions in Section A and TWO questions from Section B. Section A will be collected after the first 40 minutes.

SECTION A
(20 MARKS)

Answer ALL the questions in this Section.

For items 1 to 10, each stem is followed by four options lettered A to D. Read each item carefully and circle the letter of the correct or best option

1. In which of the sampling procedures are individuals selected in such a way that each has an equal chance of being selected? .... sampling.
    A. Cluster
    B. Random
    C. Stratified
    D. Systematic random

2. A quick numerical method of providing a visual summary of data is a ....
    A. histogram.
    B. line graph.
    C. pie chart.
    D. stem and leaf plot.

The following are the heights of 100 students measured to the nearest cm.

Heights (cm)	150 – 158	159	160 - 164	165	166 – 170
No. of Students	27	8	45	10	10

Use the data to answer question 3

3. This data would be suitable to be represented on a ....
   A. bar chart.
   B. histogram.
   C. pie chart.
   D. stem and leaf plot.

4. The mean deviation of the numbers 2, 3, 6, 8, 11 is ....
   A. 2.8
   B. 3.8
   C. 4.2
   D. 6.0

5. The measurement scales that are used to order people, objects or things along some continuum is the .... scales.
   A. interval
   B. nominal
   C. ordinal
   D. ratio

6. How many types of sampling procedures do we have?
   A. 2
   B. 3
   C. 4
   D. 5

7. What aspect of statistics makes it possible for a person to arrive at conclusions regarding a large collection of persons, places or things on the basis of the information obtained from a small portion of a larger collection? .... statistics.
   A. Basic
   B. Categorical
   C. Descriptive
   D. Inferential

8. The mean age of three students was 17 years. When a fourth student's age was added, the mean age of the students became 16.5years. How old was the fourth student? .... years.
   A. 16
   B. 15
   C. 14
   D. 13

9. The events are such that $P(A) = 0.3$, $P(B) = 0.6$ and $P(A \cap B) = 0.18$. Calculate $P(A \cup B)$.
   A. 0.62
   B. 0.72
   C. 0.82
   D. 0.90

10. The arithmetic mean of six consecutive odd numbers is 18. Find the least number.
   A. 17
   B. 15
   C. 13
   D. 11

For question 11 show all details of working.

11. A fair coin is tossed three times, let x denote the number of heads that show up. Draw the discrete probability distribution function of the random variable x.   **(10 marks)**

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SECTION B
(40 MARKS)

Answer any TWO questions from this Section.

1. a. Two balls are drawn in succession from a box with 4 red and 6 white balls. Let X denote the number of white balls drawn. Find the probability function of X if the balls are drawn without replacement.   **[10 marks]**

    b. In a beauty contest, 10 ladies were ranked by two judges as follows;

Lady	A	B	C	D	E	F	G	H	I	J
Rank by judge x	5	2	6	8	1	7	4	9	3	10
Rank by judge y	1	7	6	10	4	5	3	8	2	9

    i.   Calculate, correct to two significant figures, the rank correlation coefficient between the two judges.   **[7 marks]**

    ii. Is there any reason for saying that there is a significant agreement between the judges?   **[3 marks]**

2. a. Two ludu dice are tossed together once. If x is the random variable representing the sum of numbers that show up. Find the probability distribution function of x. [15 marks]

   b. Calculate the expected value of the random variable – i.e. $E(x)$ [5 marks]

3. a. The deviations of a set of numbers from 45 are –5, –3, –1, 0, 1, 3, 5 and 7. Calculate the:
   i. mean of the numbers (8 marks)
   ii. variance of the numbers. (2 marks)

   b. The probabilities that three girls win their respective races are $\frac{1}{3}, \frac{3}{5}$ and m. If the probability that only one of them wins her race is $\frac{1}{3}$, find the value of m. (10 marks)

4. The following table shows the grouped frequency distribution of marks obtained by 100 students in a test.

Marks	0–9	10 – 19	20 – 29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
Frequency	2	6	8	18	28	18	10	6	3	1

   a. Construct a cumulative frequency table and use it to draw a cumulative frequency curve. (8 marks)
   b. Use the curve to estimate the:
   i. median of the distribution (2 marks)
   ii. lowest mark for distinction if 15% of the students passed with distinction. (3 marks)
   iii. probability of selecting a student who scored more than 45%. (4 marks)
   iv. number of students who scored at least 80%. (3 marks)