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KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2016/2017 ACADEMIC YEAR
BRIDGING IN MATHEMATICS

Date: 5th, August, 2016.
Time: 8. 30am – 10.30am

KMA 0103 - STATISTICS AND PROBABILITY

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) Define the following terms;
- i) Sample
 - ii) Independent events
 - iii) Range
 - iv) Mode
- (4 Marks)
- b) State the different methods of sampling
- (2 Marks)
- c) A fair coin is tossed thrice. Let A be the event of observing two heads. Find $P(A)$.
- (3 Marks)
- d) A sample of 250 students were asked to indicate their favorite T.V channels and their responses were as follows
- | Citizen | KTN | Nation | Inooro | K24 |
|---------|-----|--------|--------|-----|
| 52 | 63 | 92 | 28 | 15 |
- Draw a bar graph representing this information
- (5 Marks)
- e) A fair coin is tossed 10 times. What is the probability that one observes exactly 8 heads?
- (3 Marks)
- f) Given the following data sets, calculate the combined mean;

$$= 10, \bar{x}_1 = 5.4, n_2 = 15, \bar{x}_2 = 6.2, n_3 = 12, \bar{x}_3 = 3.8$$

(3 Marks)

- g) Given 3,6,9,3,10,7,12,1,13,15,6,5 find;
- i) Mean (2 Marks)
 - ii) Interquartile range (5 Marks)
 - iii) Mean absolute deviation (3 Marks)

QUESTION TWO (20 MARKS)

- a) A bag contains 20 fruits of which 15 are ripe and 5 are unripe. I randomly pick a fruit and sell it for Ksh. 10 if it is ripe otherwise I return it into the bag. If I repeat this three times;
- i) represent this information in a tree diagram (6 Marks)
 - ii) hence or otherwise find the probability that I make Ksh. 20 in this transaction (4 Marks)
- b) The probability that it rains in any one day of the coming week is 0.73. find the probability that;(in 4 decimal places)
- i) It rains in exactly 5 days of the coming week (4 Marks)
 - ii) It rains at least 2 days of the coming week (5 Marks)
 - iii) There will be no rainy day the coming week (1 Mark)

QUESTION THREE (20 MARKS)

- a) A sample of 2312 people from a certain national hospital in Nairobi were diagnosed with various diseases as their cause of death as follows;

Heart diseases	Cancer	Stroke	Pulmonary diseases	Accidents	Others
738	538	158	103	93	682

- i) Draw a pie chart representing the information (5 Marks)
- ii) Plot a bar graph using this information. (3 Marks)

b) The following data represent the height of some tree;

27.50 43.45 36.12 28.23 33.55 42.17 32.08 33.13 24.75 37.95
31.90 34.10 23.65 37.22 43.45 39.23 33.55 54.63 31.35 34.65
18.88 47.85 28.78 44.00 32.63 61.97 42.53 44.92 49.68 30.43
16.87 30.25 56.47 54.27 45.10 22.92 39.60 52.07 51.15 41.07

i) Organize the data into grouped frequency

(5 Marks)

ii) Compute the following using the data in (a) above;

a) Variance

(5 Marks)

b) Standard deviation

(2 Marks)

QUESTION FOUR (20 MARKS)

a) In a survey of 50 students in a certain university in Githurai, it was found that 36 students are in diploma program, 20 have personal computer and only 3 are neither diploma students nor have computers. With the help of a Venn diagram find the probability that a randomly selected student;

i) Has a computer but is not in diploma program

(8 Marks)

ii) Has a computer if he/she is in diploma program

(3 Marks)

b) Two fair dice labeled 1 to 6 are rolled. Let A be the event that the product of the two numbers showing up is greater than 21 and let B be the event that the product is divisible by 6. Find;

i) $P(A)$,

(3 Marks)

ii) $P(B)$,

(2 Marks)

iii) $P(A \cap B)$,

(1 Mark)

iv) $P(A \cup B)$

(3 Marks)

QUESTION FIVE (20 MARKS)

- a) The dean in the school of business wishes to determine the number of hours students taking bridging study. He selects a random sample of 40 students and records the number of hours each student studies per week as follows;

15.0	23.7	19.7	15.4	18.3	23.0	17.5	20.8	13.5	20.7
17.4	18.6	12.9	20.3	23.7	21.4	18.3	29.8	17.1	18.9
10.3	26.1	15.7	24.0	17.8	32.8	23.2	24.5	27.1	16.6
9.2	16.5	30.8	29.6	24.6	12.5	21.6	28.4	27.9	22.4

- i) Organize the data into grouped frequency distribution starting with 9.2 (5 Marks)
- ii) Plot a histogram for this data (4 Marks)
- iii) Plot the Ogive curve(on a separate graph) (4 Marks)
- iv) Using (iii) above, estimate;
- a) Median (3 Marks)
- b) 3rd quartile (2 Marks)
- c) 5thdecile (2 Marks)