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(Knowledge for Development)

KIBABII UNIVERSITY
UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR
SECOND YEAR FIRST SEMESTER
MAIN EXAMINATION

FOR THE DIPLOMA IN INFORMATION TECHNOLOGY

COURSE CODE: DIT 072

COURSE TITLE: INTRODUCTION TO PROBABILITY AND STATISTICS

DATE: 22/06/2021

TIME: 2.00 pm-4 pm

INSTRUCTIONS TO CANDIDATES

Answer Question One and Any other TWO Questions

TIME: 2 Hours

QUESTION 1: COMPULSORY (24 MARKS)

- a. Define the following terms (2 marks)
- i. Statistics (1 mark)
 - ii. Classical probability
 - iii. Conditional probability (1 mark)
- b. Name all the four stages that is involved in undertaking statistics (4 marks)
- c. Construct frequency distribution table for the following marks obtained by 50 students
 57 67 46 30 44 56 43 54 65 57 41 50 48 51 62 59 58 55 48 47 34 27 60 52
 65 36 68 72 54 51 23 50 38 42 63 75 12 33 26 39 35 47 43 52 56 59 64 77
 15 21 (7 marks)
- d. Compute the arithmetic mean, mode and median of the followings (4 marks)
 3, 4, 1, 1, 3, 2, 1, 5, 3, 4, 3
- e. Suppose a game is to be played with a simple die assumed fair in this game a player wins \$20 if a 2 turns up, \$40 if 4 turns up, losses \$30 if 6 turns up, will the player neither wins or loses if any other faces turned up (3 marks)
- f. What is the expectation of a random variables (2 marks)

QUESTION 2 (18 MARKS)

- a. Given the following data 3,4,5,6, and 7 find the variance (2 marks)
- b. Construct a frequency histogram using 6 classes for this data
 76 84 76 103 92 47 98 54 80 91 69 86 83 75 93 89 96 65 94 85
 (6marks)
- c. Given the distribution bellow find the variance (6 marks)

x	10	15	16	20	17	14	10	16
f	3	6	7	11	9	5	4	2

- d. A group of accounting students are tested in QT techniques and management accounting. Their ranking in the two test were as follows

QT	2	7	6	1	4	3	5	8
MA	3	6	4	2	5	1	8	7

Calculate the spearman rank correlation coefficient (4 marks)

Question 3 (18 marks)

- a. Using the following data find the best line of fit (6 marks)

expenditure	25	30	15	75	40	65	24	35	70
Defective parts	50	35	60	15	46	20	45	42	22

- b. Find the arithmetic mean, mode and median of the following grouped frequency distribution (12 marks)

class	frequency
10-19	7
20-29	15
30-39	18
40-49	25
50-59	30
60-69	20
70-79	16
80-89	7

QUESTION 4 (18 MARKS)

- a. Define the following terms
Probability (1 mark)
Range (1 mark)
- b. A couple has two children what is the probability that both are boys given that at least one is a boy (4 marks)
- c. Give the axioms of probability (3 marks)
- d. Find the variance of the following random variable

$$f(x) = \begin{cases} \frac{1}{2}x & 0 \leq x \leq 2 \\ 0 & \text{otherwise} \end{cases} \quad (5 \text{ marks})$$

- e. When a coin is tossed the probability of having a head (H) is $\frac{1}{3}$, if the coin is tossed 2 times what is the probability of having two tails (TT). Using a tree diagram (4 marks)

QUESTION 5 (18 MARKS)

- a. The following table shows the pattern of inspection of expenditure and defective parts delivered to customers

expenditure	25	30	15	75	40	65	24	35	70
Defective parts	50	35	60	15	46	20	45	42	22

Find how strong is the relation between inspection in expenditure and defective and what extend they may predict the defective part deliveries from the knowledge of expenditure inspection. (8 marks)

- b. Find the standard deviation of the following grouped data (10 marks)

Class	f
10–20	5
20–30	4
30–40	8
40–50	13
50–60	12
60–70	9
70–80	7
80–90	3