



*(Knowledge for Development)*

**KIBABII UNIVERSITY**

**(KIBU)**

**UNIVERSITY EXAMINATIONS  
2017/2018 ACADEMIC YEAR**

**SUPPLEMENTARY/SPECIAL EXAMINATIONS  
YEAR TWO SEMESTER ONE EXAMINATIONS**

**FOR DIPLOMA  
(INFORMATION TECHNOLOGY)**

**COURSE CODE : DIT 072**

**COURSE TITLE : INTRODUCTION TO  
PROBABILITY AND STATISTICS**

**DATE: 19/10/2018**

**TIME: 9:00 A.M – 11:00 A.M.**

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**INSTRUCTIONS TO CANDIDATES**

**ANSWER QUESTIONS ONE AND ANY OTHER TWO.**

**QUESTION ONE [24 MARKS]**

- a. Define the following terms [5 marks]
- (i) Random experiment
  - (ii) Concept of probability
  - (iii) Mutually exclusive events
  - (iv) Continuous Variable
  - (v) Population.

- b. The grades of 10 students on their first management test are shown below. [6 marks]

94      61      96      66      92  
68      75      85      84      78

- i. Construct a frequency distribution. Let the first class be 60 – 69.9
  - ii. Construct a cumulative frequency distribution.
  - iii. Construct a relative frequency distribution
- c. A set of data has quartiles 30 and 75, and median 40. What would you conclude about the shape of the data distribution? [3 marks]
- d. Suppose that the probability of living to be older than 70 is 0.6 and the probability of living to be older than 80 is 0.2. If a person reaches her 70<sup>th</sup> birthday, what is the probability that she will celebrate her 80<sup>th</sup>? [4 marks]
- e. You have been given the following calculated values for a set of data containing x and y values:  $\sum x = 45$ ,  $\sum y = 76$ ,  $\sum xy = 473$ ,  $\sum x^2 = 284$ ,  $\sum y^2 = 794$  and  $n = 8$ . What is the value of the sample correlation coefficient between x and y? [4 marks]
- f. Two coins are tossed, find the probability that two heads are obtained. [3 marks]  
Note: Each coin has two possible outcomes H (heads) and T (Tails).

**QUESTION TWO [18 MARKS]**

- a. A frequency distribution for the ages of students in a class is given below. [10 marks]

x = age	f = frequency	fx
18	4	72
19	5	
20	7	
21	3	63
22	4	88
23	2	

24	0	
25	1	25
26	1	
Totals:		

- i. Construct a histogram or a bar graph for the data
  - ii. What is the shape of the distribution?
  - iii. Fill in the missing values in the table and compute the mean age of the students.
  - iv. Find the median age
  - v. Which value, mean or median, is a better measure of the center in this case. Explain
- b. The probability distribution of a random variable  $X$  is given in the table below

$x$	$P(X = x)$
0	0.24
1	0.38
2	0.20
3	0.13
4	0.05

Find the mean  $\mu$  and the standard deviation  $\sigma$  of  $X$ .

[8 marks]

### QUESTION THREE [18 MARKS]

- a. The grades of a group of 1000 students in an exam are normally distributed with a mean of 70 and a standard deviation of 10. A student from this group is selected randomly.
- [10 marks]
- i) Find the probability that his/her grade is greater than 80.
  - ii) Find the probability that his/her grade is less than 50.
  - iii) Find the probability that his/her grade is between 50 and 80.
  - iv) Approximately, how many students have grades greater than 80?



b. The hourly wages of a sample of eight individuals is given below.

Individual      Hourly Wage (dollars)

A	27
B	25
C	20
D	10
E	12
F	14
G	17
H	19

For the above sample, determine the following measures:

[8 marks]

- i. The mean.
- ii. The standard deviation.
- iii. The 25th percentile.

#### QUESTION FOUR [18 MARKS]

a. When a die is rolled and a coin (with Heads and Tails) is tossed, find the probability of obtaining

i) Tails and an even number

[2 marks]

ii) a number greater 3

[2 marks]

iii) Heads or an odd number

[2 marks]

b. Find  $x$  and  $y$  so that the ordered data set has a mean of 42 and a median of 35.

17, 22, 26, 29, 34,  $x$ , 42, 67, 70,  $y$

[6 marks]

The exam grades of 7 students are given below.

70, 66, 72, 96, 46, 90, 50

Find

i. the mean

[3 marks]

ii. the sample standard deviation

[3 marks]

### QUESTION FIVE [18 MARKS]

a. The frequency table of the monthly salaries of 20 people is shown below.

salary(in \$)	Frequency
3500	5
4000	8
4200	5
4300	2

i) Calculate the mean of the salaries of the 20 people.

[4 marks]

ii) Calculate the standard deviation of the salaries of the 20 people.

[4 marks]

b. Consider the following three data sets A, B and C.

$$A = \{9,10,11,7,13\}$$

$$B = \{10,10,10,10,10\}$$

$$C = \{1,1,10,19,19\}$$

i) Calculate the mean of each data set.

[3 marks]

ii) Calculate the standard deviation of each data set.

[3 marks]

ii) Which set has the largest standard deviation?

[3 marks]

iii) Is it possible to answer question c) without calculations of the standard deviation?

[2 marks]