MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS 2018/2019 ACADEMIC YEAR
THIRD YEAR SECOND SEMESTER

SCHOOL OF SCIENCE
BACHELOR OF SCIENCE

COURSE CODE: BTM 3206
COURSE TITLE: STATISTICS AND DATA ANALYSIS

DATE: 16TH APRIL 2019   **TIME: 0830 – 1030 HRS**

INSTRUCTIONS TO CANDIDATES

Answer Question **ONE** and any other two questions

1 .(a) Explain the difference between the following terms as used in statistical analysis:
   (i) Data and variable   **(2mks)**
   (ii) Quantitative variable and qualitative variable **(2mks)**
   (iii) Primary data and secondary data   **(2mks)**
   (iv) Continuous data and discrete data   **(2mks)**
   (V) cross section data and time series data   **(2mks)**

(b) Describe four functions of statistics   **(4 mks)**
(c) In a certain test,40 students scored the following marks:
43 39 59 56 58 63 71 40 72 66 47 38 51 50 61
64 32 78 29 32 45 80 70 57 52 46 45 39 58 72 41
53 56 53 66 63 61 46 82 26
i) Using class interval of 10 and 10-19 , 20-29, as the first two classes make a frequency distribution table   **(6 mks)**
ii) Assuming a suitable working mean ,estimate the mean.   **(3 mks)**
iii) compute the variance and hence the standard deviation   **(5 mks)**
iv)State the modal class.   **(2 mks)**

2.a)State four levels of measurement and give an example in each
                                                  (4mks)
  b) (i)What is a probability?   **(1mk)**
   (ii)A primary school consist of pupils in grade 1,2,3,4,5,6,7 and 8. Grades 2,3,4,5,6,7 and 8 all contain the same number of pupils but there is twice this number in grade 1. A pupil is selected at random from all pupils in the school, what is the probability that the pupil will be in ;
   (i)Grade 5?   **(3mks)**
   (ii)an even numbered grade?   **(3mks)**
c)(i)What is skewness?   **(1mk)**

 (ii) The following data relate to profits of 1000 companies in Kenya shillings:

Profit(ksh) "000	Number of companies
100-119	17
120-139	53
140-159	199
160-179	194
180-199	327
200-219	208
220-239	2

Calculate the Karl person's coefficient of skewness and comment on it.

(6mks)

3.a)What is a hypothesis? **(1mk)**

 b)What is the the difference between null hypothesis and the alternative hypothesis. **(4mks)**

 c)A restaurant tells its customers that the average cost of dinner is sh 52 with a standard deviation of sh 4. A group of concerned customers thinks that the average cost is higher.In order to test the restaurant's claim ,100 customers purchased a dinner at the store and found the mean to be sh 53.

(i)Write down the hypothesis for the test under this scenario. **(2mks)**

(ii)Perform the hypothesis test at 5% level of significance and state the decision. **(6 mks)**

d) (i)What is random variable? **(1mk)**

(ii)Let X be a continuous random variable. Show that the function ,

$$f(x) = \begin{cases} \dfrac{1}{2}x, & 0 \leq X \leq 2 \\ 0, & otherwise \end{cases}$$

 Is a probability density function and hence calculate P($0 \leq x \leq 1$).

(6mks)

4. a)What is correlation? **(2mks)**

b)A study was conducted to find whether there is any relationship between the units of milk produced per hour (X) and the units spoiled per hour(Y). The following set of data from 10 companies was arrived at.

X	94	98	106	114	107	93	98	88	103	95
Y	4	5	6	7	6	5	6	4	7	5

Determine the correlation coefficient for this set of data and interpret your answer accordingly. **(9mks)**

c) (i) What is regression analysis? **(2mks)**

(ii)The following data shows the advertising expenses in thousands and the sales in thousand in a random sample of six supermarkets:

Advertising cost(X)	1.5	1.0	2.8	0.4	1.3	2.0
Sales(Y)	36	28	54	19	29	43

(i)Find the regression equation. **(7mks)**
(ii)Estimate the net operating profit when the advertising cost is ksh.7000. **(2mks)**

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