JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF BUSINESS AND ECONOMICS

UNIVERSITY EXAMINATION FOR THE DIPLOMA IN BUSINESS ADMINISTRATION

SECOND YEAR, FIRST SEMESTER 2019/2020 ACADEMIC YEAR

MAIN CAMPUS

COURSE CODE: BBM2216

COURSE TITLE: STATISTICS AND QUANTITATIVE METHODS IN BUSINESS

DATE:24/11/20   **EXAM SESSION:3-6 PM**

TIME: 2 HOURS

Instructions

1. Answer Question One (compulsory) and any other 2 questions
2. Show all your the calculations.

3. **2.   Candidates are advised to write on the text editor provided, or to write on a foolscap, scan and upload alongside the question**
4. **3.   Candidates must ensure they submit their work by clicking "finish and submit attempt" button at the end.**

QUESTION ONE

a) State three assumptions of a binomial probability distribution   3marks
b) Highlight three probability sampling methods   6marks
c) Describe the steps involved in hypothesis testing   6 marks
d) Distinguish the following terms as used in sampling and estimation techniques
      i.   Type I and type ii error   2marks
      ii.   Population mean and arithmetic mean   2Marks
      iii. Discrete random variable and continuous   2marks

e) The following set of data represent the time taken by cars in a given parking bay in minutes

   24, 26,28,32,27, 5, 1, 18, 7, 9, 11, 15, 13, 14, 18, 29, 31, 32, 6, 4, 2, 9, 18, 27, 30

Required

     i) Calculate average mean of the distribution in minutes (3marks)

     ii) Evaluate median of the distribution   2marks

     iii) The modal parking time   1mark

     iv) The range of the of the distribution   1mark

     v) The coefficient of variation of the distribution   2marks

QUESTION TWO

a. Explain the following terms as used in hypothesis testing
      i.   Level of significance   (1mark)
      ii.   Region of rejection   (1mark)
b. Explain three factors that determine the size of Pearson's product coefficient of determination   (6 marks)
c. The following data were obtained from the records of a certain company relating to the year 2020

Month	Total overhead cost –y (sh)	direct labour hours –x (sh)
January	14,250	856
February	13,000	536
March	13,000	640
April	12,500	600

May	13,250	680
June	13,750	808

Required:

i. The least squares regression function relating the direct labour hours to the total overhead cost   (7 marks)
ii. The coefficient of determination   (4marks)
iii. Comment on the results on c(ii)   (1mark)

QUESTION THREE

a) The frequency distribution table for the marks scored by 80 students in a statistics examination is as presented in the table below

Marks	Number of students
0-9	5
10-19	9
20-29	14
30-39	10
40-49	13
50-59	12
60-69	7
70-79	5
80-89	3
90-99	2

Required:

i. Calculate the mean mark of the class using an assumed mean of 50 marks (3marks)
ii. Find the interquartile deviation of the distribution   3marks
iii. The median of the distribution   2marks
iv. The standard deviation of the distribution 3marks

b) Highlight two differences between descriptive statistics and inferential statistics (4 marks)
c) Explain the following terms as used in statistics
   i. An ogive curve 1mark
   ii. Population   1mark
   iii. Sample   1 mark
   iv. Statistics   1 mark
   v. Skewness   1 mark

QUESTION FOUR

a) Explain the following terms as used in probability:
- i. Addition law of probability   (2marks)
- ii. Multiplication law of probability (2marks)
- iii. Mutually exclusive events (1mark)
- iv. Sample space   (1mark)

b) Nairobi residents were surveyed to determine the readership of newspapers available. 50% of the residents read the newsera newspaper. 60% of the residents read standard newspaper. 20% of the residents read both newspapers

Required

The probability that a resident selected at random reads either newsera or standard newspaper or both   (3marks)

c) Six consultants work for xyz ltd a consultant has a 20% chance of being absent from work in a given day. The company needs to establish the probability of more than two consultants being absent from work

Required

Compute the above probability of absence assuming a binomial distribution   (4 marks)

d) The following distribution represents weekly earnings of different employees in a hotel establishment

Income sh	4000-4200	4200-4400	4400-4600	4600-4800	4800-5000	5000-5200
Employees	14	22	44	50	40	30

Required

- i. Frequency polygon   (5mark)
- ii. From your frequency polygon above obtained from   c(i) above   estimate the mode (1mark)

QUESTION FIVE

a) Outline three differences between regression and correlation analysis (3 marks)

b) In the context of time series analysis, describe three differences between additive and multiplicative models (6 marks)

c)Uniway Ltd uses three machines in its production department. Machine X produces 3% defective items , Machine Y produces 5% defective items and machine Z produces 10% defective itemsof the total output

From the three machines, 60% of the items are produced by machine X, 30% by machine Y and 10% by machine Z. one item is selected at random from a day's production

Required:

i) A probability tree diagram showing the joint probabilities from the machines (6marks)

ii) The probability that the item is defective (2 marks)

iii) The probability that the item was produced by machine X or machine Z given the item is defective (3marks)