



STRATHMORE BUSINESS SCHOOL
BACHELOR OF FINANCIAL SERVICES (BSF)
BACHELOR OF COMMERCE (BCOM)
END OF SEMESTER EXAMINATION

MAT 1201: INTRODUCTION TO BUSINESS STATISTICS

DATE: 14th March 2022

TIME: 2 Hours

INSTRUCTIONS

1. This examination consists of **FIVE** questions.
 2. Answer Question **ONE (COMPULSORY)** and any other **TWO** questions.
 3. You may use a **SIMPLE CALCULATOR**. No **MOBILE PHONES** in the exams room.
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Question One (30 Marks)

- (i) Explain the difference between a histogram and a bar chart. (2 marks)
- (ii) It is said that secondary data should be used with utmost care. Explain three characteristics of secondary data that a statistical investigator must observe before using them. (3 marks)
- (iii) A car salesman takes inventory and finds that he has a total of 125 cars to sell. Of these 97 are the 2001 model, 11 are the 2000 model, 12 are the 1999 model and 5 are the 1998 model.
 - (a) Which two types of charts are most appropriate to display the data? (2 marks)
 - (b) Construct the charts. (4 marks)
- (iv) In a certain investigation, 460 persons were involved in the study and based on an inquiry on their age, it was known that 75% of them were 22 or more. The following frequency distribution shows the age composition of the persons under the study.

Age in years	13	18	23	28	33	38	43	48
Number of persons	24	f_1	90	122	f_2	56	20	33

- (a) Find the median and interpret your answer. (3 marks)
- (b) Compute the 1st and 3rd quartiles and interpret your answer. (3 marks)
- (c) Compute the 5th decile and 83rd percentile and interpret your answer. (3 marks)

- (d) Find the mean deviation about the mean and interpret your answer. (3 marks)
- (v) A box of 20 candles consists of 5 defective and 15 non-defective candles. If 4 of these candles are selected at random, what is the probability that 3 will be non-defective. (3 marks)
- (vi) The coefficient of correlation between two variables X and Y is 0.48. The covariance is 36. The variance of X is 16. Find the standard deviation of Y . (4 marks)

Question Two (20 Marks)

- (i) A student's final grades in mathematics, physics, chemistry and sports are, respectively 82, 86, 90 and 70. If the respective credits received for these courses are 3, 5, 3 and 2, determine an appropriate average grade. (4 marks)
- (ii) The following data gives the weekly expenditures (in dollars) for households randomly selected from a given County.

4.57	3.95	6.95	3.80	1.50	2.99	5.05	7.84
8.00	14.75	9.33	1.05	5.08	7.00	9.60	18.99
9.15	11.32	4.75	9.95	3.63	1.99	1.39	13.09
19.31	11.15	7.73	12.00	7.58	16.35	5.20	5.30

- (a) Construct a frequency distribution table using less than method to write classes. Take \$0 as the lower boundary of the first class and \$4 as the width of each class.. (4 marks)
- (b) Use your table to determine the mean expenditure and the 87th percentile and interpret your answers (5 marks)
- (iii) The price of a commodity increased by 5% from 1989 to 1990, 8% from 1990 to 1991 and by 77% from 1991 to 1992. Find the average price increase. (3 marks)
- (iv) Two persons participated in five shooting competition and were able to hit the target correctly out of fifteen shots given below.

Competitor A	6	12	12	10	7
Competitor B	12	15	7	7	4

Which competitor is more uniform in shooting performance? (4 marks)

Question Three (20 Marks)

- (i) Differentiate between correlation and regression. (4 marks)
- (ii) In a study of the relationship between X = mean daily temperature for the month and Y = monthly charges on electrical bill, the following data were gathered:

X	20	30	50	60	80	90
Y	125	110	95	90	110	130

- (a) Find the correlation coefficient and interpret. (4 marks)
- (b) Fit regression model to the data and interpret the slope of your model. (8 marks)
- (c) Compute coefficient of determination and interpret the result. (4 marks)

Question Four (20 Marks)

- (i) Define the following terms as used in probability. (3 marks)
 - (a) Experiment
 - (b) Sample space
 - (c) Event
- (ii) Suppose we have two urns labeled A and B. A contains 3 maize marbles and 5 blue marbles; B contains seven maize marbles and 4 blue. A biased coin is flipped, for which $P(H) = \frac{2}{3}$. If the coin comes up heads, we draw a marble from urn A, and if it comes up tails, we draw a marble from urn B.
 - (a) What is the probability of drawing a blue marble? (5 marks)
 - (b) If you are told that the marble drawn was a yellow one, what is the probability that the coin came up heads when flipped? (5 marks)
- (iii) Urn A has 3 black balls and 6 white balls. Urn B has 400 black balls and 400 white balls. Urn C has 6 black balls and 3 white balls. A person first randomly chooses one of the urns and then grabs a ball randomly from the chosen urn.
 - (a) What is the probability that the ball be black if a person grabbed a black ball? (4 marks)
 - (b) What is the probability that the ball came from urn B? (3 marks)

Question Five (20 Marks)

- (i) Explain four limitations of statistics. (4 marks)
- (ii) Make a frequency distribution table for the data on mileage ratings using 5 intervals (five classes) of equal length. Include the left end point of each interval and omit the right end point. (3 marks)

36.3	41.0	36.9	37.1	44.9	40.5	36.5	37.6	33.9	40.2
38.5	39.0	35.5	34.8	38.6	41.0	31.8	37.3	33.1	37.0
37.1	40.3	36.7	37.0	33.9					

- (iii) Use your table in (ii) to answer the following questions
 - (a) Construct a well labeled histogram and estimate the mode of the distribution. (4 marks)
 - (b) Construct a well labeled cumulative frequency curves (ogive) and estimate the median and the quartiles of the distribution. (5 marks)
 - (c) Find Bowleys's coefficient of skewness and interpret your answer. (4 marks)

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