



**STRATHMORE BUSINESS SCHOOL
BACHELOR OF FINANCIAL SERVICES (BFS)
END OF SEMESTER EXAMINATION
MAT 1202 INTRODUCTION TO BUSINESS STATISTICS**

DATE: 21st March 2025

Time: 16:00-18:00

Instructions

1. *This examination consists of **FIVE** questions.*
2. *Answer **Question ONE (COMPULSORY)** and any other **TWO** questions.*
3. *Mark allocations are shown in brackets.*
4. *Use of an electronic Calculator is allowed for this examination.*

Question One (30 Marks)

- a) Differentiate between quantitative and qualitative data, providing two examples of each. [4 marks]
- b) Differentiate between a bar chart and a pie chart, providing examples of when each would be appropriate to use. [4 marks]
- c) A retail store tracks its monthly sales (in thousands of units) for four different products over three months as follows:

Product	January	February	March
Product A	50	45	55
Product B	40	35	50
Product C	70	65	60
Product D	30	25	35

- (i) Which graphical representation is most appropriate for displaying this data? [2 marks]
 - (ii) Construct the selected graph and interpret the trends. [4 marks]
- d) A dataset of 600 individuals categorizes their age into the following groups:

Age Range	Number of Individuals
20 - 29	80
30 - 39	150
40 - 49	200
50 - 59	120
60 - 69	50

- (i) Calculate the median age group. [3 marks]
- (ii) Compute the 1st and 3rd quartiles and interpret their significance. [4 marks]
- (iii) Calculate the interquartile range (IQR) and explain its importance in this context. [3 marks]
- e) Explain the difference between correlation and causation, and why it's important in statistical analysis. Provide an example to illustrate your point. [4 marks]
- f) A jar contains 12 red, 8 blue, and 5 green marbles. If three marbles are drawn at random without replacement, what is the probability that all three are red? [2 marks]

Question Two (20 Marks)

- a) A student's scores in four subjects are as follows: Mathematics (85), English (78), Science (92), History (88). The corresponding weights for these subjects are 4, 3, 5, and 3 respectively. Calculate the weighted mean of the scores. [4 marks]
- b) Explain the concept of "sample" and "population" in statistics. Why is sampling used, and what is the potential issue that can arise from using a sample? [4 marks]
- c) The daily temperature readings (in °C) for a week are: 28, 30, 29, 32, 31, 29, 28. Construct a stem-and-leaf plot for the data and interpret the distribution. [3 marks]
- d) The following table gives the marks of 58 students in statistics class. Calculate the average marks of this group using the step-deviation method. [6 Marks]

Marks	Number of Students
0 - 10	4
10 - 20	8
20 - 30	11
30 - 40	15
40 - 50	12
50 - 60	6
60 - 70	2
Total	58

- e) Discuss the difference between primary and secondary data. Give one advantage and one disadvantage of using secondary data. [3 marks]

Question Three (20 marks)

- a) Define the following terms as used in descriptive statistics:
 - (i) Range [2 marks]
 - (ii) Variance [2 marks]
 - (iii) Standard deviation [2 marks]

- b) The data below relates to the number of successful sales made by the salesman employed by a large microcomputer firm in a particular quarter. calculate the standard deviation of number of sales. [4 marks]

No. of sales	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29
No. of salesman	1	14	23	21	15	6

- c) Discuss the importance of using the coefficient of variation when comparing the variability of two different data sets. [2 marks]
- d) In a small company, two typists are employed. Typist A types one page in ten minutes while typist B takes twenty minutes for the same.
- (i) Both are asked to type 10 pages. What is the average time in minutes taken for typing one page? [1 mark]
- (ii) Both are asked to type for one hour. What is the average time in minutes taken by them for typing one page. [2 marks]
- e) An economy has grown at 5 percent in the first year, 6 percent in the second year, 4.5 percent in the third year, 3 percent in the fourth year and 7.5 percent in the fifth year. If it started at the value of 100, what is the average rate of growth of the economy during the five years? [5 marks]

Question Four (20 marks)

- a) Explain the differences between correlation and regression and provide an example of each. [4 marks]
- b) In a study of the relationship between the number of hours studied (X) and exam scores (Y), the following data are collected:

Hours Studied (X)	2	4	6	8	10
Exam Score (Y)	50	65	70	80	90

- (i) Calculate the correlation coefficient and interpret the result. [4 marks]
- (ii) Fit a regression model to the data and interpret the slope. [6 marks]
- (iii) Determine the coefficient of determination and explain its significance. [4 marks]
- c) If the regression equation from (b) is used to predict the exam score for a student who studies 7 hours, what is the predicted score? [2 marks]

Question Five (20 marks)

- a) The mean of the following frequency distribution was found to be 1.46.

No. of accidents	No. of days (<i>frequency</i>)
0	46
1	?
2	?
3	25
4	10
5	5
Total	200 days

Calculate the missing frequencies. [4 marks]

- b) The following are the monthly expenses (in dollars) of a sample of 25 families: 500, 520, 550, 600, 620, 650, 700, 720, 750, 780, 800, 820, 850, 880, 900, 920, 950, 1000, 1020, 1050, 1080, 1100, 1120, 1150, 1180.

Construct a frequency distribution table using five classes. [4 marks]

- c) Using the frequency distribution from (b), calculate the standard deviation of the expenses and interpret the result. [5 marks]

- d) The weekly spending (in dollars) for a sample of households is as follows:

Spending	Frequency
\$0-50	5
\$51-100	8
\$101-150	12
\$151-200	7
\$201-250	3

- (i) Calculate the mean spending using the direct method and interpret the result. [5 marks]

- (ii) Determine the 75th percentile and interpret its significance. [2 marks]

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