UNIVERSITY OF RUHUNA

FACULTY OF MANAGEMENT AND FINANCE

Bachelor of Business Administration Degree Programme 1000 Level First Semester End Examination (November / December 2021)

Academic Year 2020/2021

BBA 11023 Business Mathematics and Statistics

Instructions: Answer only five (5) questions from six (6) questions

Time: Three hours (03)

Total Marks: 70

Instructions:

> ➢ Non-programmable calculators are permitted.
> ➢ Statistical answers should be shown with suitable tables.

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(1)   (a) Simplify the following statement

   $2(3x-1) +5 - 2\{ 2(2x +5) +4x -3 +3(x+2) \} -6$ (3 marks)

   (b) Find the factors

   $(2y + 3)^2 - (3y -2)^2$ (2 marks)

   (c) Solve this equation

   $\frac{2p-6}{2} + \frac{3p+4}{4} = 5$ (3 marks)

   (d) Solve the following equations
            $0.2m + 0.5n = 9$

            $(m+n)/3 = 10$ (3 marks)

   (e) Find the roots of $X^2 - 4x = -2$ (3 marks)

                                                                 (Total 14 marks)

(2) (a) A person who has taken a loan of Rs 5000 at a simple rate, paid Rs 5500 after two
months and settled the loan. Find the annual simple interest rate.   (3 marks)

(b) A person deposited Rs 80000 in a selected bank account which pays 8% compound
interest compounding in quarterly. What is the amount available in this account after
6 years and 3 months?   (3 marks)

(c) A person deposited Rs 4000 each at the end of every month in a bank account over a
period of 10 years. This bank pays 12% annual compound interest for its accounts
and compounding in monthly. What is the total value of this annuity after 10 years?
(4 marks)

(d) At the end of every three months a company deposited the same amount in an
account for 12 years to create a sinking fund of Rs 2 million. This bank pays 8%
compound interest and compounding it quarterly. Find the equal deposit value.
(4 marks)
(Total 14 marks)

(3) (a) Find the limits
$$\lim_{x \to -1} \frac{8x^2 - 4x}{2x^2 - x}$$ (2 marks)

(b) Find the value of f^3 (x= 2) for $f(x) = 3x^5 + 3x^2 + 4$

(3 marks)

(c) Find f '(x) for $f(x) = (3x^3 - 6)^5$ (3 marks)

(d) Find Integral of following function
$F(x) = \int (14x^6 + 18x^5 - 6x^2 - 4) \, dx$ (3 marks)

(e) Find Integral $f(x_{3 \text{ to } 1}) = \int_1^3 (16x^3 - 3) \, dx$ (3 marks)

(Total 14 marks)

(4)

I. Briefly describe the three methods of collecting primary data. (3 marks)

II. The following table shows the number of lottery tickets sold by a lottery ticket agent in the last month, along with the relevant days.

Number of sold lotteries	Number of days
300-400	1
400-500	3
500-600	7
600-700	10
700-800	6
800-900	2
900-1000	2

Calculate the following by using information in the above table

(a) Mode value (2 marks)
(b) Median value (2 marks)
(c) Mean vale (3 marks)
(d) Variance (2 marks)
(e) Standard deviation (1 mark)
(f) Coefficient of variance (1 mark)

(Total 14 marks)

(5) The table below shows the number of hours of online lessons attended per day by the seven selected school children and their monthly telephone cost in rupees.

Participated online lesson hours per day	Telephone network cost per month (Rs)
3	600
4	850
5	1100
6	1200
2	250
4	900
4	700

(a) Identify the independent and dependent variable (1mark)
(b) Draw scattered diagram and trend line (2 marks)
(c) Formulate regression function (7 marks)
(d) Estimate the cost of monthly telephone network for a school student who attends 8 hours online lessons per day. (2 marks)
(e) Can you use this regression function to estimate monthly telephone network cost of a business person? Give reason. (2 marks)

(Total 14 marks)

(6)

I.   (a) Define the term of "sample". (1 mark)
     (b) Briefly describe two types of probability sampling methods   (2 marks)

II.   The following table shows the number of people who visit a small town in last seven days and the daily sales of a restaurant in the town in thousand rupees.

Number of people who arrived in the town	The daily sales of the restaurant are in thousand rupees
150	4
220	5
420	10
350	8
181	4
250	5
340	6

(a)   Identify independent and dependent variables of above table   (1 mark)

(b)   Calculate correlation coefficient   (7 marks)

(c)   Show your r value in a r range line   (1 mark)

(d)   What is the relationship between the above two variables?   (1 mark)

(e)   Restaurant owner said that "as more and more people come to town, the sales of restaurant increases". Do you agree with this statement? Give reasons.
      (1 mark)

                                                    (Total 14 marks)

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