



UNIVERSITY OF RUHUNA
FACULTY OF MANAGEMENT AND FINANCE

No. of Pages : 05
No. of Questions: 06
Total Marks : 70

BACHELOR OF BUSINESS ADMINISTRATION HONOURS DEGREE

1000 LEVEL FIRST SEMESTER END EXAMINATION - AUGUST 2022

Three Hours

BBA 11023 - Business Mathematics and statistics

Academic Year 2021/2022

Instructions

- Answer only five (5) questions from six (6) questions
- Answer of a new question should be started on a new page of the answer book.
- Non programmable calculators are permitted
- Statistical answers should be shown with relevant tables.

(1) (a) Multiply the following statement

$$(p-4)(p^2-3p-4) \quad (2 \text{ marks})$$

(b) Simplify the following statement

$$3[2(2m-1)-3\{-3(2m-4)-1\}-5m-3] \quad (3 \text{ marks})$$

(c) Find the factors

$$4p^3 - 32y^3 \quad (3 \text{ marks})$$

(d) Solve the following equations

$$\begin{aligned} 0.2p + 1 &= 0.3q \\ 0.2q &= 22 - 0.4p \end{aligned} \quad (3 \text{ marks})$$

(e) Find the roots of x

$$X^2 = 3x + 5 \quad (3 \text{ marks})$$

(Total 14 marks)

- (2) (a) A person repaid Rs 2500 to an informal moneylender to settle a loan valued at Rs 2000 received earlier in two weeks. Calculate the monthly and annual simple interest rates of this transaction.

(3 marks)

- (b) A bank gives 12% annual interest for its savings accounts by compounding monthly. Find the annual effective interest rate.

(3 marks)

- (c) A person deposited Rs 320000 in a savings account at a selected bank, which pays 8% annual interest for its saving accounts compounded quarterly. What will be the total amount of this account after 4 year and 3 months?

(4 marks)

- (d) Compute the amount of annuity if a person deposits Rs10000 at the end of each three months for a period of 6 years at a bank that pays 12% annual interest in compounded quarterly.

(4 marks)

(Total 14 marks)

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

(3 marks)

- (b) Find $f'(x)$ for $f(x) = (3x^4 - 2x)(2x^3 - 1)$

(3 marks)

- (c) Find $f'(x)$ for $f(x) = (4x^3 - 5x)^3$

(3 marks)

- (d) Evaluate $f(x_{3 \text{ to } 1}) = \int_1^3 (20x^4 - 4x - 3) dx$

(3 marks)

- (e) Evaluate $F(x) = \int (24x^5 + 15x^4 - 6x^2 - 5) dx$

(2 marks)

(Total 14 marks)

(4) The following table shows living expenses per month of selected university students who live in hostel or boarding houses.

Monthly living expenses in thousand Rs	Number of students
6-8	4
8-10	6
10-12	12
12-14	9
14-16	7
16-18	5

- I. Distinguish between central tendency measures and dispersion measures.
(2 marks)
- II. You are required to calculate the followings using the tabled information.
- (a) The mode value
(2 marks)
- (b) The median value
(2 marks)
- (c) The mean value
(3 marks)
- (d) The standard deviation (take mean to the nearest value)
(3 marks)
- (e) The coefficient of variance
(2 marks)
- (Total 14 marks)

- (5) The following table shows daily sales and calculated daily profits of a vegetable seller in main city for 10 days.

Daily sales in thousand rupees	Daily profit in thousand rupees
35	8
50	9.5
33	7
27	5.5
40	9
52	12
54	9.3
60	10.7
49	9
50	10

- (a) Distinguish between independent variable and dependent variable
(2 marks)
- (b) Identify the independent variable and dependent variable of the given table
(1 marks)
- (c) Draw a scattered diagram and trend line
(1 marks)
- (d) Formulate the regression function
(6 marks)
- (e) Estimate the profit if the seller received 56000 in daily sales
(2 marks)
- (f) Can you estimate daily profit of bookshop by using of your regression line?
(2 marks)

(Total 14 marks)

(6) The following table shows the height in inches and weight in kg of the selected ten students from the Faculty of Management and Finance, University of Ruhuna.

Student's height in inches	Student's weight in kg
63	57
60	60
65	65
66	57
59	56
59	65
63	60
62	66
59	57
65	65

- (a) Distinguish between general correlation and rank correlation techniques. (2 marks)
- (b) Can you use the general correlation coefficient for the above table to calculate the relationship pattern? Give reasons, (1 marks)
- (c) Calculate the rank correlation coefficient between the two variables mentioned above. (7 marks)
- (d) Show your calculated r' value in correlation value range line. (2 marks)
- (e) Interpret your calculated rank correlation value. (2 marks)
- (Total 14 marks)
