



UNIVERSITY OF RUHUNA
FACULTY OF MANAGEMENT AND FINANCE

No. of Pages : 03
No. of Questions: 05
Total Marks : 70

BACHELOR OF BUSINESS ADMINISTRATION HONOURS DEGREE
1000 LEVEL FIRST SEMESTER END EXAMINATION – AUG./SEP. 2023

Three Hours

BBA - 11023 BUSINESS MATHEMATICS AND STATISTICS Academic Year 2022/2023

Instructions

- The question paper contains **five (05)** questions.
- **Answer all questions.**
- Non-programmable calculators are permitted.

Question 01

a. What is the necessity of studying Business Mathematics and Statistics by management students?

(02 Marks)

b. Find out factors for the following expressions.

i. $a^6 - b^6$

(02 Marks)

ii. $x^9 + y^{12}$

(02 Marks)

iii. $(a-3)^2 - (a+1)^2$

(02 Marks)

iv. $y^2 - 14y + 24$

(02 Marks)

c. Solve the following equations.

i. $8x^2 + 5x = 4$

(02 Marks)

ii. $\frac{14}{x^2 - 4} + \frac{4}{x^2 - 3x + 2} = \frac{4}{x^2 + x - 2}$

(02 Marks)

(Total 14 Marks)

Question 02

a.

i. Define the term “Annuity”.

(02 Marks)

ii. Identify four characteristics of an annuity.

(02 Marks)

iii. List out the difference between compounding interest and annuity.

(02 Marks)

b. A person receives Rs. 147,950.00 at the end of 3 years and 9 months of period from his savings account at the Sampath Bank. The bank provides 8% of annual interest for the deposits in this special account which is compounded quarterly. You are required to calculate the initial deposit at the bank account.

(02 Marks)

c. Sachithra has invested Rs. 30,000.00 in a bank. A part of the money from the investment was invested in a fixed deposit which pays 8% of the annual interest rate and the balance was invested in a savings account that pays 5% of the annual interest rate. At the end of the one year period, Sachithra was able to receive Rs. 2,100.00 as the interest income. What is the amount invested in the fixed deposit?

(03 Marks)

d. Sri Lankan Cricket team sets up a reserve fund to purchase of equipment that can be replaced in exactly five years from now at an expected cost of Rs. 1,000,000.00 then. Calculate the amount that should be deposited into the fund at the end of each of the five years. Consider the interest rate is 9% per annum and compounded annually.

(03 Marks)

(Total 14 Marks)

Question 03

a. Find out the limits of the followings.

i. $\lim_{x \rightarrow 3} \frac{2x^2 - 32}{x^3 - 4x^2}$ (02 Marks)

ii. $\lim_{x \rightarrow 2} \frac{f(x) - f(3)}{x - 3}$ when $f(x) = 6x^2 + 2$ (02 Marks)

iii. $\lim_{x \rightarrow 3} \frac{x^3 - 125}{x - 5}$ (02 Marks)

b. Find out the derivatives of the following functions.

i. $f(x) = (4x^2 - 6x)(4x^2 - 8)$ (02 Marks)

ii. $f(x) = (4x^3 - 6)^4$ (02 Marks)

c. Find out antiderivatives of following derivative functions.

i. $f(x) = \int (30x^5 - 20x^4 - 21x^2 - 4) dx$ (02 Marks)

ii. $f(x_2 \text{ to } -2) = \int_{-2}^2 (8x^3 + 10x^4 + 3) dx$ (02 Marks)

(Total 14 Marks)



Question 04

- a. Define quantitative and qualitative data. (02 Marks)
 - b. Identify four (04) primary data sources. (02 Marks)
 - c. Provide four (4) characteristics of a good questionnaire. (02 Marks)
 - d. Describe the following terms in statistics.
 - i. Sample Frame (1.5 Marks)
 - ii. Sample Size (1.5 Marks)
 - e.
 - i. Distinguish between probability and non-probability sampling methods. (02 Marks)
 - ii. Briefly explain three probability sampling techniques. (03 Marks)
- (Total 14 Marks)

Question 05

A study is conducted using seven (07) students to investigate the relationship and effects of revision time and lecture attendance on exam performance. The data obtained from the survey is listed in the table given below.

| Observations | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---------------------------|----|----|----|----|----|----|----|
| Exam Performance (Marks) | 40 | 44 | 46 | 48 | 52 | 58 | 60 |
| Lecture attendance (Days) | 4 | 5 | 6 | 7 | 9 | 12 | 14 |

You are required to,

- i. Identify the independent and dependent variables of the study. (01 Mark)
 - ii. Find out the correlation-coefficient between exam performance and lecture attendance. Interpret your results. (05 Marks)
 - iii. Forecast the exam performance at 15 days of lecture attendance using the given information. (08 Marks)
- (Total 14 Marks)
