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SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FIRST SEMESTER MBA (Integrated) DEGREE EXAMINATION(R), NOVEMBER 2024

(2024 SCHEME)

Course Code : 24IMB103

Course Name : Business Mathematics

Max. Marks : 60 **Duration:3 Hours**

PART A

(Answer all questions. Each question carries 2 marks)

1. State the parallelogram law of vector addition.
2. What is the base of the natural logarithm? Write the standard form of a logarithmic function.
3. List out the methods of solving linear equations
4. What is simple interest? What is the formula for calculating simple interest?
5. What is the standard form of a quadratic equation?

PART B

(Answer one full question from each module, each question carries 8 marks)

MODULE I

6. If $\vec{A}$=5i – j −3k and $\vec{B}$= i + 3j− 5 k, then show that the vectors a+b and a-b are perpendicular 8

OR

7. Explain the basic operations on sets with examples. 8

MODULE II

8. Explain the concept of domain and range. How do you find the domain and range of a given function? Illustrate with examples. 8

OR

9. List out different types of real functions with examples 8

MODULE III

10. Describe the steps of solving a system of linear equations using Cramer's Rule. Use an example of a 3×3 system of equations to demonstrate the procedure. 8

OR

11. Explain the operations of matrix. Provide examples of each operation. 8

MODULE IV

12. Explain the applications of arithmetic and geometric progressions in real-life situations. Provide a detailed example where A.P. and G.P. are used to model a scenario. 8

OR

13. A) A sum of Rs. 20,000 is borrowed by Heena for 2 years at an interest of 8% compounded annually. Find the Compound Interest (C.I.) and the amount she has to pay at the end of 2 years. 8
B) What amount is to be repaid on a loan of Rs. 12000 for 1 and 1/2 years at 10% per annum compounded half-yearly?

MODULE V

14. Solve the equation $[(X^2 - 1) / (X^2-5)] + [(X^2 - 5) / (X^2 - 9)] + [(X^2 - 9) / (X^2 - 1) = 3$ 8

OR

15. Mr. Roy invests in the Unit Trust of India, purchasing units at various prices as follows: 8

- 100 units at Rs. 10.30 per unit
- 200 units at Rs. 10.40 per unit
- 400 units at Rs. 10.50 per unit
- 300 units at Rs. 10.80 per unit

After observing a decrease in price, Mr. Roy sees an opportunity to lower the average cost of his holdings. He plans to buy additional units at Rs. 10.25 per unit to bring the average cost per unit down to Rs. 10.50.

Given that Mr. Roy only buys units in multiples of 100, determine the number of units he needs to purchase at Rs. 10.25 per unit to achieve his target average cost of Rs. 10.50 per unit.

PART C

(Compulsory question, the question carries 10 marks)

16. a) Find the complement of set S = {4, 8, 12, 16}, where the universal set is all multiples of 4 that are smaller than 50.
b) Find the inverse of the function f(x) = 4x + 6.
c) Find the sum of the first 100 natural numbers
d) Solve by Cramers Rule $2x + 3y = 3$ and $4x - y = 11$

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