Register No.: ………………………………   Name.: ……………………………………………………………

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

THIRD SEMESTER MBA DEGREE EXAMINATION (Regular), FEBRUARY 2022

(2020 Scheme)

Course Code :   **20MBA445**

Course Name: **STATISTICS METHODS FOR FINANCIAL ANALYTICS**

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

PART A

(Answer all questions. Each question carries 2 marks)

1. What are the three types of Kurtosis?
2. Define AR(p) Process
3. Define Continuous Time Stochastic Process
4. What is Eigen Vector
5. What is the derivative of $\frac{3}{x^5} + 2x^2$

PART B

(Answer any 3 questions. Each question carries 10 marks)

6. A wealth manager has got a database of a group of 1,00,000 investors whose monthly income was normally distributed with mean value of Rs. 75,000 per month and a standard deviation of Rs. 15,000.

     a) What will be the lowest income of the top 1000 people in this group?

                                                           [5 Marks]

     b) If he believes that his target group will be investors with a minimum salary of Rs. 70,000 what is the number of prospective clients he can narrow down to?

                                                           [5 Marks]

7.   a. What is the difference between autoregressive and moving average models?

                                                           (3 Marks)

     b. The following estimates for an AR(2) model of some returns data

$$y_t = 0.803y_{t-1} + 0.682y_{t-2} + u_t$$

Where u_t is a white noise error process.

By examining the characteristic equation, check the estimated model for stationarity.

                                                           (7 marks)

8. What is Brownian motion? List the properties of standard Brownian motion.

                                                            (5 Marks)

Give two example of a function that cannot be differentiated and explain the reason why

                                                            (5 Marks)

9. Use Cramer's rule to find all the solutions for the system of equations

$$2x + 2y - 3Z = -20$$
$$x - 4y + Z = 6$$
$$4x - y + 2Z = -1$$

                                                           (10 Marks)

10. Determine the tax that the government should impose for maximum tax revenue if the

demand and supply functions are:

Before taxation, demand: $p = 25 - 2x^2$; supply: $p = 5 + x$

After taxation, demand: $p = 25 - 2x^2$; supply $p = 5 + x + t$

(10 Marks)

PART C

(Compulsory question, the question carries 20 marks)

11. Consider the below numerical example for an open input-output model. Let the technology matrix A and the input vector y be given as follows. Compute the output vector x

$$A = \begin{bmatrix} 1/5 & 1/5 & 0 \\ 2/3 & 3/5 & 1/5 \\ 3/5 & 2/5 & 1/5 \end{bmatrix} and\ y = \begin{pmatrix} 2 \\ 0 \\ 1 \end{pmatrix}$$

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