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SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SECOND SEMESTER MBA DEGREE EXAMINATION (R), MAY 2023
(2021 Scheme)

Course Code : 21MBA114

Course Name: Business Analytics

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

PART A

(Answer all questions. Each question carries 2 marks)

1. What are bubble charts?
2. Define Big Data.
3. Define Uniform Distribution and write its density function.
4. Define k-NN algorithm.
5. What is an unbounded solution?

PART B

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

6. The average monthly wages and standard deviations for two restaurants A & B are as given below
   - Restaurant A: The average monthly wage is Rs. 26,000 and the standard deviation in the wages is 4680. The total number of employees is 100
   - Restaurant B: The average monthly wage is Rs. 29,000 and the standard deviation in the wages is 4930. The total number of employees is 88

   a) Which factory pays the larger amount as monthly wages?

   Marks (4)

   b) Which factory shows greater variability in the distribution of wages?

   Marks (6)

7. a) State the 3 empirical rules in standard deviation related to one standard deviation, two standard deviation and three standard deviations

   Marks (5)

   b) Explain any two ways to identify outliers in a data set?

   Marks (5)

8. A Business School summarized the gender and UG course of its incoming class as follows

Gender	U.G. Course				
	Engineering	**Science**	**Humanities**	**Arts**	**Vocational**
Male	67	46	27	95	15
Female	33	26	31	53	7

   a. Construct the Joint Probability Table

   Marks (4)

b. Calculate the Marginal Probabilities

Marks (4)

c. What is the probability that a Female student is an Engineer or Science Graduate

Marks (2)

9. A medical researcher observed that Health Risk (HR) is influenced by factors like BMI, weekly alcohol use in ml (A), hours of exercise (E) and daily hours of sleep (S). The simplest model he could use for describing Job Involvement in terms of these variables was

$$HR = a + b_1BMI + b_2A - b_3E - b_4S$$

where a, b_1, b_2, b_3, and b_4 are positive constants

a. How does a change in each variable affect Health Risk?

Marks (4)

b. How do the variables influence each other?

Marks (2)

c. What limitations might this model have? Explain of how this model might be made more realistic?

Marks (4)

10. Elaborate the types of constraints in Optimization models

Marks (10)

PART C

(Compulsory question, the question carries 20 marks)

Answer All Sub-Sections

11. Data is collected on the salary, gender and work experience of 30 employees in a firm. Salary (Y) is collected as amount in rupees, gender (G) (1= Female and 0 = Male) and work experience (WE) is collected in number of years.

a) Elaborate on the framework for developing a Multiple Linear Regression Model

Marks (6)

b) Build a regression model with salary as the dependent variable and by including an interaction variable between gender and work experience along with gender and work experience as independent variables.

Marks (2)

c) The SPSS output for the regression model including the interaction variable is given in the table below. How will the equation be for Male and Female employees?

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	14803.345	1353.898		11.370	0.000
G	-5757.175	2177.484	-0.438	-2.298	0.022
WE	2323.754	293.463	0.721	8.132	0.000
G * WE	-3113.098	812.124	-0.578	-3.619	0.002

Marks (4)

d) Elaborate on the emergence of Business Analytics as a Competitive Strategy Marks (8)

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