Printed Page:- Subject Code:- AMBA0103

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute)

Affiliated to Dr. A.P.J. Abdul Kalam Technical University, Uttar Pradesh, Lucknow

MBA

SEM: I - THEORY EXAMINATION (2021 - 2022)

Subject: Introduction to Business Analytics

Time: 03:00 Hours Max. Marks: 100

General Instructions:

1. All questions are compulsory. It comprises of three Sections A, B and C.

- Section A - Question No- 1 is objective type question carrying 1 mark each & Question No- 2 is very short type questions carrying 2 marks each.
- Section B - Question No- 3 is Long answer type - I questions carrying 6 marks each.
- Section C - Question No- 4 to 8 are Long answer type - II questions carrying 10 marks each.
- No sheet should be left blank. Any written material after a Blank sheet will not be evaluated/checked.

SECTION A 20

1. Attempt all parts:-

1-a. If a frequency distribution is positively skewed, the mean of the distribution is (CO1) 1

1. Greater than the mode
2. Less than the mode
3. Equal to mode
4. Less than mean

1-b. Find the mode of the following distribution: 7,4,3,5,6,3,3,2,4,3,4,3,3,4,4,2,3 (CO1) 1

1. 7
2. 6
3. 5
4. 3

1-c. Karl Pearson's coefficient of correlation is defined by (CO2) 1

1. $r_{xy} = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}}$
2. $r_{xy} = \frac{\sum (x_i - \bar{x}) \sum (y_i - \bar{y})}{n \sigma_x \sigma_y}$
3. $r(x,y) = \frac{n \sum xy - \sum x \sum y}{\sqrt{n \sum x^2 - (\sum x)^2} \sqrt{n \sum y^2 - (\sum y)^2}}$
4. All of the above

1-d. Which statement is true: (CO2) 1

1. Correlation coefficient is the geometric mean between the regression coefficients.
2. If one of the regression coefficients is greater than unity, the other must be less than unity.
3. Arithmetic mean of regression coefficient is greater than the Correlation

coefficient.

4. All of the above

1-e. A and B are two events such that P(A)=0.4 and P(A ⋂ B) = 0.2 , then $P(A \cap \overline{B})$ is equal to (CO3) 1

1. 0.4
2. 0.2
3. 0.6
4. 0.8

1-f. What is the probability of an impossible event? (CO3) 1

1. 0
2. 1
3. Not defined
4. Insufficient data

1-g. Which of the following is component of the time series modeling? (CO4) 1

1. Seasonality
2. Minimax
3. Maximax
4. None of the above

1-h. Formula for Fisher's Method is _____ (CO4) 1

1. $\sum p_{01} = \frac{\sum p_0 q_0}{\sum p_1 p_0} \times 100$
2. $\sum p_{01} = \frac{\sum p_1 q_1}{\sum p_0 q_1} \times 100$
3. $\sum p_{01} = \frac{\sum p_1}{\sum p_0} \times 100$
4. $\sum p_{01} = \sqrt{\frac{\sum p_1 q_0}{\sum p_0 q_0} \times \frac{\sum p_1 q_1}{\sum p_0 q_1}} \times 100$

1-i. A type of decision-making environment is (CO5) 1

1. certainty
2. uncertainty
3. risk
4. all of these

1-j. Decision Nodes are represented by _____ (CO5) 1

1. Disks
2. Squares
3. Circles
4. Triangles

2. Attempt all parts:-

2.a. Define Range and Inter quartile range. (CO1) 2

2.b. Prove that Arithmetic mean of regression coefficient is greater than the Correlation coefficient. (CO2) 2

2.c. What are the four properties that must be present in order to use the Binomial 2

distribution? (CO3)

2.d. Define Time Reversal Test. (CO4) 2

2.e. Define Machine Learning. (CO5) 2

SECTION B 30

3. Answer any five of the following:-

3-a. Define statistics. Explain the importance of statistics with reference to business and industry. (CO1) 6

3-b. Calculate the mean deviation from mean for the following data: (CO1) 6

Class Interval	2-4	4-6	6-8	8-10
frequency	3	4	2	1

3-c. Two lines of regression are given by 7x - 16y + 9 = 0 and -4x + 5y - 3 = 0 and var(x) = 16. Calculate - (i) The mean of x and y (ii) The correlation coefficient. (CO2) 6

3-d. Calculate coefficient of rank correlation from the following data:- (CO2) 6

Marks in Account	48	33	40	9	18	14	67	24	19	65
Marks in Statistics	12	13	29	6	15	4	20	9	5	19

3.e. State and prove Bay's theorem. (CO3) 6

3.f. Fit a linear trend to the following data by the least squares method: (CO4) 6

Year	1990	1992	1994	1996	1998
production	18	21	23	27	16

3.g. Explain Decision Tree and its applications in business. (CO5) 6

SECTION C 50

4. Answer any one of the following:-

4-a. Find the Coefficient of Variation if the scores of two batsmen A & B in ten innings during a certain match are: (CO1) 10

A	32	28	47	63	71	39	10	60	96	14
B	19	31	48	53	67	90	10	62	40	80

4-b. Calculate the first four moments about mean of the following distribution and hence find skewness and kurtosis : (CO1) 10

x	10 – 20	20-30	30-40	40-50	50-60	60-70	70-80
f	1	20	69	108	78	22	2

5. Answer any one of the following:-

5-a. Calculate the two regression equations from the following data: - (CO2) 10

X	6	2	10	4	8
Y	9	11	5	8	7

5-b. The data on price and quantity purchased relating to a commodity for 5 months is given below: (CO2) 10

Month	January	February	March	April	May
Prices(Rs):	10	10	11	12	12
Quantity(Kg):	5	6	4	3	3

Find the Karl Pearson's Coefficient of Correlation between prices and quantity and comment on its sign and magnitude.

6. Answer any one of the following:-

6-a. State and prove the theorem of additional probability. A bag contains 7 white, 6 red and 5 black balls . Two balls are drawn at random. Find the probability that they will both be white. (CO3) 10

6-b. At a parking place the average number of car-arrivals during a specified period of 15 minutes is 2. If the arrival process is well described by a Poisson process, find the probability that during a given period of 15 minutes 10

i. no car will arrive
ii. at least two cars will arrive
iii. at most three cars will arrive
iv. between 1 and 3 cars will arrive (CO3)

7. Answer any one of the following:-

7-a. What is Fisher's ideal formula for preparing index number? Does it satisfy the time reversal test and factor reversal test? Explain. (CO4) 10

7-b. Compute the Laspeyre's, Pasche's, Fisher's and Marshall-Edgeworth's index number from the following data- (CO4) 10

Item	1880		1889	
	Price	Quantity	Price	Quantity
A	15	22	16	30
B	13	18	4	11
C	3	10	5	20
D	11	4	3	7

8. Answer any one of the following:-

8-a. What are the characteristics of decision under certainty, uncertainty and risk? (CO5) 10

8-b. What is AI and what is the use of AI in business? (CO5) 10