

23 AN 104: STATISTICS FOR BUSINESS ANALYTICS

Course Code	23 AN 104	Course Delivery Method	Classroom / Blended Mode
Credits	4	CIA Marks	30
No. of Lecture Hours / Week	5	Semester End Exam Marks	70
Total Number of Lecture Hours	75	Total Marks	100
Course Focus	Employability	Entrepreneurship	Skill Development

COURSE OUTCOMES: By the end of the course, students will be able

- CO-1 To gain an understanding of how Managers Use Business Analytics to formulate and solve business problems and to support managerial decision making.
- CO-2 To provide students with knowledge of mathematical models for quantitative analysis of managerial problems in Industry and to improve skills in the use of descriptive statistics for business decisions.
- CO-3 To enable the students understanding probability concepts, probability distributions and its applications in business.
- CO-4 To develop the ability to evaluate the predictive analytics models like correlation, Regression and Time Series analysis.
- CO-5 To understand the significance of Business analytics in managerial decision-making

COURSE CONTENT

UNIT-I: Mathematics and Statistics for Business Analytics: Application of Differentiation, Maxima and Minima, Matrices and Matrix Operations using Cramer's Rule and Inverse Method, Permutations and Combinations (*Problems*) **(15 Hours)**

UNIT-II: Descriptive Statistics: Diagrammatic and Graphical Representation of the data Measures of Central Tendency, Measures of Dispersion, Skewness, and kurtosis. (*Theory and Problems*). **(15 Hours)**

UNIT-III: Probability and Probability distributions: Concept of Probability, Definitions of Probability, Addition Theorem of Probability, Conditional Probability and Multiplication theorems of Probability, Baye's Theorem of Probability and its Applications. Theoretical distributions: Binomial Distribution, Poisson distribution and Normal distribution, Their Properties and Applications (*Theory and Problems*). **(15 Hours)**

UNIT-IV: Business Analytics for Decision making: Introduction to Hypothesis, Procedure for Testing of Hypothesis, Large and Small Sampling Tests, Z-Test, Single Proportion, Two Proportions, Single Mean, Two Means, t-Test, Single Mean, Difference of Means, Paired t-test, Chi-square test, Goodness of Fit, Independence of Attributes, ANOVA One way and Two

way Classification. (*Problems*).

(15 Hours)

UNIT-V: Predictive Analytics: Correlation, Regression and Time Series: Correlation: Types of Correlation, Simple and Rank Correlation coefficient in the case of two variables
Regression: Meaning and importance of Regression Analysis, Estimation of Lines of Regression in the case of two variables
Time Series, Components of Time Series, Measurement of Trend (Linear Equation) (*Theory and Problems*) (15 Hours)

PRACTICAL COMPONENT:

1. Students should identify three companies using data analytics and analyze how companies are using analytics to prosper.
2. Should form groups (A group consists of 4-6 students) and download R most popular software (Free & Open source) for data management and statistical analysis of data
3. Students should conduct team base project which is unified and practical case on a topic of their choice, with approximately 4-6 students per group.
4. Assess the strengths and limitations of analytics and predictive modeling techniques for different business applications and varying data conditions using free and open-source software's like R.
5. Students are asked to conduct Market Survey to know the consumer perception towards any FMCG.

REFERENCES:

1. S.C. Gupta.-, Fundamentals of Statistics, 7th Revised Edition (2013) Himalaya Publishing House, New Delhi.
2. Sharma, J.K.-, Fundamentals of Business Statistics, 2nd Edition (2000) Pearson Education, New Delhi.
3. Sancheti, Dc & V.K Kapoor, Business Mathematics, 3rd Edition (2014) Sultan Chand & Sons, New Delhi..
4. Sharma, J.K., Quantitative Methods- Theory & Applications, 3rd Edition (2010) Macmillan New Delhi.
5. Shmueli, Pateland Bruce, *Data Mining for Business Intelligence, Concepts, Techniques and Applications*, Wiley.
6. Powell and Baker, *Management Science: The Art of Modeling with Spreadsheets*, Wiley.
7. Ledolter, *Data Mining and Business Analytics with R*, Wiley.

MODEL QUESTION PAPER
M.B.A. ANALYTICS (REGULAR) DEGREE EXAMINATION
First Semester
23 AN 104: STATISTICS FOR BUSINESS ANALYTICS

Duration: 3 hours

Maximum Marks: 70

SECTION- A

Answer the Following Questions

5×4=20 Marks

1.(A) What are the Measures of Central Tenancy. (CO2) (L2)

(OR)

(B) Explain Co-efficient of skewness. (CO2) (L2)

2. (A) State Addition theorem of probability. (CO3) (L1)

(OR)

(B) Define Binomial Distribution. (CO3) (L1)

3. (A) Illustrate Scatter Diagram Method. (CO4) (L3)

(OR)

B) Explain regression coefficients? (CO4) (L3)

4. A) Explain moving average method. (CO4) (L3)

(OR)

(B) Explain uses of Time Series Analysis. (CO4) (L3)

5. (A) Explain Procedure for testing of hypothesis. (CO5) (L2)

(OR)

B) Distinguish between large and small sample tests with examples. (CO5) (L2)

SECTION- B

Answer All Questions

5×8=40 Marks

6. A) Explain importance of statistics in business analytics,.(CO1 (L2)

(OR)

B) Calculate the coefficient of variation from the following:(CO2) (L3)

Age in years	10-19	20-29	30-39	40-49	50-59	60-69
Frequency	360	700	903	503	270	1200

7. A) What is Normal Distribution? Explain characteristics and importance of the Normal distribution? (CO3) (L2)

(OR)

B) The contents of urns I, II and III are as follows:

- 1 white, 2 black and 3 red balls,
- 2 white, 1 black and 1 red balls, and
- 4 white, 5 black and 3 red balls

One urn is chosen at random and two balls drawn. They happen to be white and red. What is the probability that they came from urns I, II or III? (CO3) (L2).

1. A) Distinguish between correlation and regression analysis? (CO4)(L3)

(OR)

B) The Two regression equations between x and y are: $10x - 20y - 14 = 0$ and $5x - 6y = 47$. The standard deviation of x is 9. Find

- i) the mean values of x and y;
- ii) the variance of y; and
- iii) the coefficient of correlation between x and y.(CO4)(L3)

2. A) The sales data of an item in six shops before and after a special promotional campaign are as under (CO5)(L4)

	A	B	C	D	E	F
Before Campaign	48	23	26	43	45	37
After campaign	53	24	25	50	51	40

(OR)

B) Two types of batteries are tested for their length of life and the following data are obtained: (CO5) (L4)

	No. of Samples	Mean life in hours	Variance
Type A	9	600	121
Type B	8	640	144

There is a significance difference in the two means Table value = 2.131

10 A) straight-line trend for the following series. Estimate the value for 2018. (CO4)(L3)

Year	2011	2012	2013	2014	2015	2016	2017
Production in Tonnes	60	72	75	65	80	85	95

(OR)

B) What is time series explain components of time series? (C04)(L3)

SECTION C - (1 x 10 =10 marks)

Case study (Compulsory)

11. A Movie producer is bringing out a new movie. In order to map out his advertising he wants to determine whether the movie will appeal most to a particular age group or whether it will appeal equally to all age groups. The producer takes a random sample from persons attending a pre-reviewing showing of the new movie and obtains the following result. Use χ^2 -test to derive the conclusion. (CO4) (L4)

AGE GROUPS

Persons	Under-20	20-39	40-59	60 and over	Total
Like the movie	320	80	110	200	710
Disliked the movie	50	15	70	60	195
Indifferent	30	5	20	40	95
Total	400	100	200	300	1000