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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)

MBA MF

SEM: II - THEORY EXAMINATION (2025 - 2026)

Subject: Introduction to Business Analytics

Time: 3 Hours

Max. Marks: 100

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of **three Sections -A, B, & C**. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. 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:-

- (1.1) The statistical software which is known for its extensive data manipulation and analysis capabilities in social sciences? (CO1,K1) 1
- (a) Python
- (b) SPSS
- (c) Excel
- (d) R
- (1.2) Select the one which is true about primary data? (CO1,K1) 1
- (a) It is collected from existing databases
- (b) It is gathered from secondary sources
- (c) It is collected directly from the place of origin
- (d) It is not suitable for business analytics
- (1.3) An Excel dashboard is primarily used to: (CO2,K1) 1
- (a) Display large amounts of data
- (b) Write detailed reports
- (c) Visualize key metrics and KPIs
- (d) Edit data
- (1.4) To add a chart title in Excel, you should: (CO2,K1) 1
- (a) Click "Add Chart Element" > "Chart Title"
- (b) Type directly on the chart
- (c) Use the "Insert" tab
- (d) None of these

- (1.5) The measure of central tendency which should be used when dealing with a skewed distribution of data? (CO3,K1) 1
- (a) Mean
 - (b) Mode
 - (c) Median
 - (d) Geometric Mean
- (1.6) The given formula =AVERAGE(C4:E12) returns? (CO3,K1) 1
- (a) The sum of the values in cells C4 to E12
 - (b) The average of the values in cells C4 to E12
 - (c) The median of the values in cells C4 to E12
 - (d) The mode of the values in cells C4 to E12
- (1.7) The effect of multicollinearity in regression analysis is shown as? (CO4,K1) 1
- (a) Increased precision of coefficient estimates
 - (b) Inflated standard errors of coefficients
 - (c) Decreased variance of errors
 - (d) Improved model accuracy
- (1.8) The primary goal of data mining is? (CO4,K1) 1
- (a) To perform basic arithmetic calculations on data
 - (b) To visualize data for better understanding
 - (c) To discover hidden patterns or relationships in data
 - (d) To summarize and describe data
- (1.9) The term "forecast horizon" refer to in time series forecasting? (CO5,K1) 1
- (a) The future time period for which forecasts are made
 - (b) The past time period used for modeling
 - (c) The interval between observations
 - (d) The degree of seasonality
- (1.10) A key assumption of the AR model is? (CO5,K1) 1
- (a) The data is non-stationary
 - (b) The data has a trend
 - (c) The data is stationary
 - (d) The data has seasonality

2. Attempt all parts:-

- (2.1) Highlight the applications of data analytics in business. (CO1,K1) 2
- (2.2) Explain the purpose of the 'Data Validation' feature. (CO2,K1) 2
- (2.3) Highlight the importance of considering skewness when assessing the variability of a dataset. (CO3,K4) 2
- (2.4) Highlight any two challenges of supervised learning. (CO4,K1) 2
- (2.5) State the applications of time series forecasting. (CO5,K1) 2

SECTION-B

30

Answer any one of the following:-

(3.1)	Describe a scenario where diagnostic analytics helps a firm understand a drop in product sales. (CO1,K2)	6
(3.2)	A manufacturing firm wants to reduce machine downtime. Which phase of the business analytics process should it emphasize, and why? (CO1,K4)	6
Answer any one of the following:-		
(3.3)	Describe the process to use conditional formatting to highlight cells based on their values. Provide an example using a dataset of exam scores. (CO2,K3)	6
(3.4)	Explain the process to create a dynamic chart that updates automatically when data changes. (CO2,K2)	6
Answer any one of the following:-		
(3.5)	Explain what does a correlation coefficient of +1, -1, and 0 indicate about the relationship between two variables? (CO3,K1)	6
(3.6)	Discuss the harmonic mean, and how is it calculated? Provide an example of when it is used. (CO3,K2)	6
Answer any one of the following:-		
(3.7)	A grocery chain uses market basket analysis to find product combinations frequently bought together. 1. Which type of learning does this fall under? 2. How can this insight be used to improve store layout? (CO4,K2)	6
(3.8)	Differentiate between classification and clustering using one business example each. State which technique is supervised and which is unsupervised. (CO4,K4)	6
Answer any one of the following:-		
(3.9)	You are given quarterly sales data of a company for the past 5 years. What steps would you take to prepare a forecast for the next quarter? (CO5,K3)	6
(3.10)	Discuss the use of ACF and PACF plots for model identification. (CO5,K2)	6
SECTION-C		50
4. Answer any <u>one</u> of the following:-		
(4.1)	A chain of fitness centers is planning expansion into new cities and wants to assess risk and ROI across various locations. How can prescriptive analytics be used to guide their expansion strategy? (CO1,K5)	10
(4.2)	Explain the relationship of the business analytics process with the organization decision-making process. (CO1,K4)	10
5. Answer any <u>one</u> of the following:-		
(5.1)	A dataset has the following values: 45, 50, 50, 60, 65, 70, 76. Compute the mode and explain in what business situations mode is a more relevant measure than mean or median. (CO2,K3)	10
(5.2)	A college compares results of two MBA batches: Batch A: Mean score = 78, SD = 5 Batch B: Mean score = 75, SD = 2 Using coefficient of variation, determine which batch shows better consistency in performance. (CO2,K3)	10
6. Answer any <u>one</u> of the following:-		
(6.1)	Explain how the choice of measure of location (mean, median, or mode) can impact	10

the interpretation of statistical results in research studies. Provide examples from published studies to support your argument. (CO3,K5)

- (6.2) Explain how to use the correlation coefficient in the context of portfolio diversification in finance. Provide an example showing the calculation of correlation coefficients between asset returns. (CO3,K3) 10

7. Answer any one of the following:-

- (7.1) Provide a real-world example where business analytics, data mining, and AI are integrated to solve a business problem. (CO4,K4) 10
- (7.2) Describe the role of anomaly detection in data mining. Mention some techniques used for this purpose. (CO4,K2) 10

8. Answer any one of the following:-

- (8.1) An FMCG brand wants to optimize its supply chain using past sales data. Describe how time series forecasting supports this objective. (CO5,K2) 10
- (8.2) Discuss the importance of residual analysis in validating time series forecasting models. List some common residual diagnostic tests. (CO5,K2) 10