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PAPER 11 – Financial Management & Business Data Analytics

PREVIOUS YEAR – Theory Questions

(June 23 – June 26)

Question 1.

What is Wealth Maximization as the Objective of Financial Management? Why is profit maximization not an operationally feasible criterion? State briefly Interrelationship between Investment, Financing and Dividend Decisions. (June 23)

Answer 1

Wealth Maximization means maximization of the market price of the equity shares of the company in the long run. The long run implies a period which is long enough to reflect the normal market price of the shares irrespective of short-term fluctuations. The long-term price of an equity share is a function of two basic factors:

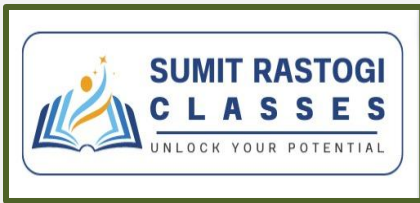
- (i) The likely rate of earnings or earnings per share (EPS) of the company; and
- (ii) The Capitalization rate reflects the liking of the investors of a company.

Profit maximization is not an operationally feasible criterion because it suffers from the following limitations:

1. It is vague because it is not clear whether the term relates to economic profit, accounting profit, profit after tax or before tax.
2. It ignores the Timing of Returns.
3. It ignores Risk factor.
4. It assumes Perfect Competition.
5. In new business environment profit maximization is regarded as –
 - (i) Unrealistic
 - (ii) Difficult
 - (iii) Inappropriate
 - (iv) Immoral

Investment, financing, and dividend decisions are integral components of a company's financial management, and they are closely interconnected, collectively shaping the company's overall financial strategy.

1. Investment decisions directly impact both financing and dividend decisions. When a company decides to undertake an investment project, it requires funds to finance it. This leads to financing decisions, where the company must choose the appropriate mix of debt and equity to raise the necessary capital. If the company opts for more debt, it might have higher interest obligations, affecting the available funds for dividends. Conversely, if it raises more equity, it could lead to dilution of ownership and potentially affect shareholders' dividend expectations.



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2. Financing decisions, in turn, influences investment and dividend decisions. The cost and availability of financing can affect the feasibility of certain investment opportunities. If financing is costly or restricted, the company might forego potentially profitable investments. Moreover, the level of debt in the capital structure impacts on the company's financial risk, affecting its dividend policy. High debt levels may result in the company retaining more earnings to repay debt, limiting dividend payouts.
3. Dividend decisions also play a role in the interrelationship. The company's dividend policy depends on its financial performance and the available cash flow. If the company pays out a substantial portion of earnings as dividends, it might have fewer funds available for investments. This could impact on the company's growth prospects and, consequently, its ability to undertake profitable projects in the future. Ultimately, the goal of these interrelated decisions is to maximize shareholder wealth while balancing risk and return. Financial managers must carefully assess the company's financial position, growth opportunities, and capital market conditions to strike an optimal balance between investment, financing, and dividend decisions. An efficient and well-structured interrelationship between these decisions can lead to a financially healthy and successful company in the long run.

Question 2.

List any four Alternative Investment Funds (AIF) and four Credit Rating Agencies in India. List any six Money Market Instruments Traded. List any four features of Treasury bills. How is Yield on Treasury Bills calculated? (June 23)

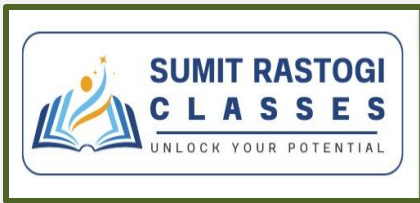
Answer 2

Alternative Investment Funds (AIF):

- Angel Fund
- Venture Capital Fund
- Private Equity Fund, and
- Hedge Funds
- Credit Rating Agencies in India:

Money market Instruments Traded:

- Call/Notice Money
- Treasury Bills
- Commercial Bills
- Certificate of Deposits
- Commercial Papers
- Inter-Bank Participation Certificates
- Inter Corporate Deposits
- Swaps



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CRISIL Ratings Limited ICRA limited

- Care Ratings Limited
- India Ratings and Research Pvt. Ltd. (Formerly Fitch Ratings India Pvt. Ltd.)

Features of Treasury Bills:

- (1) They are negotiable securities.
- (2) They are highly liquid as they are of shorter tenure and there is the possibility of inter-bank repo among them.
- (3) There is an absence of default risk.
- (4) They have an assured yield, low transaction cost and are eligible for inclusion in the securities for SLR purposes.

$$\text{Yield on Treasury Bills} = \text{Yield} = \frac{100 - \text{Purchase Price}}{\text{Purchase Price}} \times \frac{365 \text{ Days}}{\text{Days to Maturity}} \times 100$$

Question 3.

Explain briefly the five basic principles of data ethics that a business organization should follow. (June 23)

OR

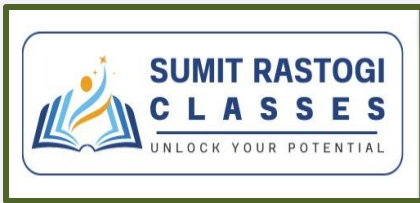
What do you mean by Data Ethics? Discuss the five basic principles of Data Ethics that a business organization should follow. (Dec. 24)

Answer 3

Data analytics can help in decision making process and make an impact. However, this empowerment for business also comes with challenges. The question is how the business organizations can ethically collect, store and use data? And what rights need to be upheld? Data ethics addresses the moral obligations of gathering, protecting and using personally identifiable information.

The five basic principles of data ethics that a business organization should follow:

- (1) **Regarding ownership:** The first principle is that ownership of any personal information belongs to the person. It is unlawful and unethical to collect someone's personal data without their consent. The consent may be obtained through digital privacy policies or signed agreements or by asking the users to agree to terms and conditions. It is always advisable to ask for permission beforehand to avoid future legal and ethical complications. In case of financial data, some data may be sensitive in nature. Prior permission must be obtained before using the financial data for further analysis.



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- (2) **Regarding transparency:** Maintaining transparency is important when gathering data. The objective with which the company is collecting user's data should be known to the user. For example, if the company is using cookies to track the online behavior of the user, it should be mentioned to the user through a written policy that cookies would be used for tracking user's online behavior and the collected data will be stored in a secure database to train an algorithm to enhance user experience. After reading the policy, the user may decide whether to accept or not to accept the policy. Similarly, while collecting the financial data from clients, it should be clearly mentioned that for which purpose the data should be used.
- (3) **Regarding privacy:** As the user may allow us to collect, store and analyze personally identifiable information (PII), that does not imply it should be made publicly available. For companies, it is mandatory to publish some financial information to the public e.g. through annual reports. However, there may be many confidential information, which if fallen into the wrong hand may create problems and financial loss. To protect the privacy of data, a data security process should be in place. This may include file encryption and dual authentication password etc. The possibility of breach of data privacy may also be done through identifying datasets.
- (4) **Regarding intention:** The intention of data analysis should never be to make profits out of others' weaknesses or for hurting others. Collecting data which is unnecessary for analysis should avoid audits unethical.
- (5) **Regarding outcomes:** In some cases, even if the intentions are good, the result of data analysis may inadvertently hurt the clients and data providers. This is called disparate impact, which is unethical.

Question 4.

What is Data Cleaning? What are the Steps for data cleaning? What are the benefits?

(June 23)

Answer 4

Data cleaning is the process of correcting or deleting inaccurate, corrupt, improperly formatted, duplicate, or insufficient data from a dataset.

Steps for Data Cleaning:

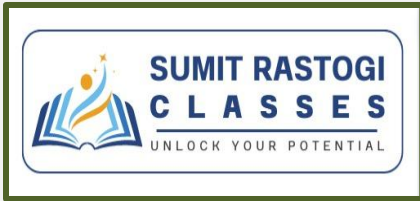
Step 1: Removal of duplicate and irrelevant information

Step 2: Fix structural errors:

Step 3: Filter unwanted outliers:

Step 4: Handle missing data

Step 5: Validation and QA



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Benefits of Data Cleaning:

- (i) Error correction when numerous data sources are involved.
- (ii) Fewer mistakes result in happier customers and less irritated workers
- (iii) Capability to map the many functions and planned uses of your data.
- (iv) Monitoring mistakes and improving reporting to determine where errors are originating can make it easier to repair inaccurate or damaged data in future applications.
- (v) Using data cleaning technologies will result in more effective corporate procedures and speedier decision-making.

Question 5.

List the following:

- (i) Objectives of Data Visualization
- (ii) Steps involved in using Data Visualization in report design
- (iii) Important four issues which the presenter should keep in mind for effective Data Visualization
- (iv) List any four Tools for visualizing and presenting the data. (June 23)

Answer 5

(i) Objectives of Data Visualization:

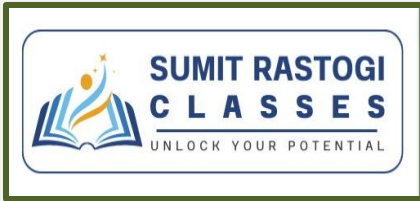
- 1. Making better data analysis:
- 2. Faster decision making
- 3. Analyzing complicated data

(ii) Steps involved in using Data Visualization in report design

- 1. Find a story in the Data
- 2. Create a narrative
- 3. Choose the most suitable Data Visualization
- 4. Follow the visual language
- 5. Publicize the report

(iii) Important issues which the presenter should keep in mind for effective data Visualization.

- 1. Know the objective
- 2. Always keep the audience in mind
- 3. Invest in the best technology
- 4. Improve the team's ability to visualize data
- 5. Tools for visualizing and presenting the data



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(iv) Any four Tools for visualizing and presenting the data.

Data visualization is the visual depiction of data and information. Using visual elements like dashboards, charts, graphs, maps etc., data visualization tools facilitate the identification and comprehension of trends, outliers, and patterns in data.

1. Dashboards
2. Bar charts
3. Histogram
4. Pie chart
5. Line chart
6. Maps
7. Gantt chart
8. Bubble Chart etc.

Question 6.

State the meaning, objectives and scope of Data Presentation Architecture (DPA). (June 23)

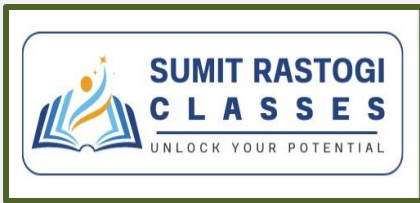
Answer 6

Data Presentation Architecture (DPA)

Meaning: Data Presentation Architecture (DPA) is a set of skills that aims to identify, find, modify, format, and present data in a manner that ideally conveys meaning and provides insight. According to Kelly Latt, "Data Presentation Architecture (DPA) is a rarely applied skill set critical for the success and value of Business Intelligence. Data presentation architecture weaves the science of numbers, data and statistics in discovering valuable information from data and making it usable, relevant and actionable with the arts of data Visualization, communications, organizational psychology and change management in order to provide business intelligence solutions with the data scope, delivery timing, format and Visualizations that will most effectively support and drive operational, tactical and strategic behavior toward understood business (or organizational) goals. DPA is neither an IT nor a business skill set but exists as a separate field of expertise. Often confusing with data Visualization, data presentation architecture is a much broader skill set that includes determining what data on what schedule and in what exact format is to be presented, not just the best way to present data that has already been chosen (which is data Visualization). Data Visualization skills are one element of DPA."

Objectives of DPA There are the following objectives of DPA:

1. Utilize data to impart information in the most efficient method feasible (provide pertinent, timely and comprehensive data to each audience participant in a clear and reasonable manner that conveys important meaning, is actionable and can affect understanding, behavior and decisions).
2. To utilize data to deliver information as effectively as feasible (minimize noise, complexity, and unneeded data or detail based on the demands and tasks of each audience).



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Scope of DPA In the light of abovementioned objectives, the scope of DPA may be defined as:

1. Defining significant meaning (relevant information) required by each audience member in every scenario.
2. Obtaining the proper data (focus area, historic reach, extensiveness, level of detail, etc.)
3. Determining the needed frequency of data refreshes (the currency of the data)
4. Determining the optimal presentation moment (the frequency of the user needs to view the data)
5. Using suitable analysis, categorization, visualization, and other display styles
6. Developing appropriate delivery techniques for each audience member based on their job, duties, locations, and technological access.

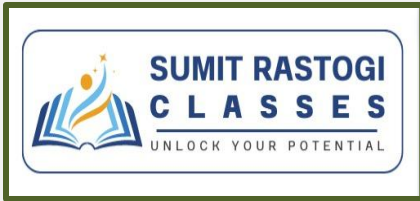
Question 7.

Examine the difference between Primary Market and Secondary Market.

(Dec. 23, June 25)

Answer 7

Primary Market	Secondary Market
It deals with new securities, i.e., securities which were not previously available, and are offered for the first time to the investors.	It is a market for old securities which have been issued already and granted stock exchange quotation.
Securities are acquired from issuing companies themselves.	Securities are purchased and sold by the investors without any involvement of the companies.
It provides funds to new enterprises & also for expansion and diversification of the existing one and its contribution to company financing is direct.	It does not supply additional funds to company since the company is not involved in transactions.
It does not lend any liquidity to the securities.	The secondary market provides facilities for the continuous purchase and sale of securities, thus lending liquidity and marketability to the securities.
It is not rooted in any spot and has no geographical existence. It has neither any tangible form nor any administrative organizational set up.	Secondary markets have physical existence in the form of stock exchange and are in a particular geographical area having an administrative organization.
Helps in creating new capital.	Helps in maintenance of existing capital.
Volume of transactions is low compared to secondary market.	Volume of transactions is high compared to primary market.



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Question 8.

Define Prescriptive Analytics and explain how it works.

(Dec. 23)

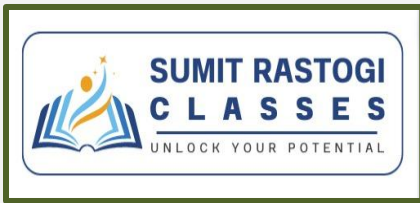
Answer 8

Definition of Prescriptive Analytics:

Descriptive analytics describe what has occurred, diagnostic analytics explore why it occurred, predictive analytics describe what could occur, and prescriptive analytics describe what should be done. This approach is the fourth, final, and most sophisticated step of the business analysis process, and it is the one that urges firms to action by assisting executives, managers, and operational personnel in making the most informed decisions possible based on the available data.

How does prescriptive analytics work?

- (i) Prescriptive analytics goes one step farther than descriptive and predictive analysis by advising the best potential business actions.
- (ii) This is the most sophisticated step of the business analytics process, needing significantly more specialized analytics expertise to execute; as a result, it is rarely utilized in daily company operations.
- (iii) A multitude of approaches and tools - such as rules, statistics, and machine learning algorithms - may be used to accessible data, including internal data (from within the business) and external data, to produce predictions and recommendations (such as data derived from social media). The capabilities of machine learning dwarf those of a human attempting to attain the same outcomes.
- (iv) The widespread misconception is that predictive analytics and machine learning are same. While predictive analytics uses historical data and statistical techniques to make predictions about the future, machine learning.
- (v) A subset of artificial intelligence, refers to a computer system's ability to understand large and often enormous amounts of data without explicit instructions, and to adapt and become increasingly intelligent as a result.
- (vi) Predictive analytics predicts what, when, and, most importantly, why something may occur. After analyzing the potential repercussions of each choice alternative, suggestions may be made regarding which options would best capitalize on future opportunities or reduce future hazards.
- (vii) Effectively conducted prescriptive analytics may have a significant impact on corporate strategy and decision making to enhance production, customer experience, and business success.



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Question 9.

“Biggest challenges lie in creating the efficiencies needed to gather and process basic financial data and continue to deliver traditional finance outputs while at the same time redeploying their limited resources to enable higher-value business decision support activities.” List of the steps to be followed to transform raw data into user friendly information.

OR

Discuss the core steps to be followed in transforming data into decision relevant information. (Dec. 25)

Answer 9

The emergence of big data has changed the world of business like never before. The most important shift has happened in information generation and the decision-making process. There is a strong emergence of analytics that supports a more intensive data-centric and data-driven information generation and decision-making process. The data that encompasses the organization is being harnessed into information.

To make the data turn into user-friendly information, it should go through six core steps:

Collection of data: The collection of data may be done with standardized systems in place. Appropriate software and hardware may be used for this purpose. Appointment of trained staff also plays an important role in collecting accurate and relevant data.

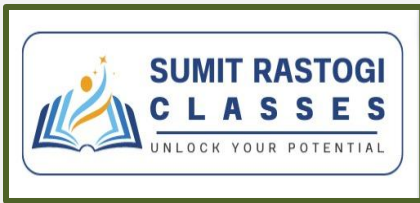
Organizing the data: The raw data needs to be organized in an appropriate manner to generate relevant information. The data may be grouped, arranged in a manner that creates useful information for the target user groups.

Data processing: At this step, data needs to be cleaned to remove the unnecessary elements. If any data point is missing or not available, that also needs to be addressed. The options available for presentation format for the data also need to be decided.

Integration of data: Data integration is the process of combining data from various sources into a single, unified form. This step includes creation of data network sources, a master server and users accessing the data from master server.

Data reporting: Data reporting stage involves translating the data into a consumable format to make it accessible by the users. For example, for a business firm, they should be able to provide summarized financial information e.g., revenue, net profit etc.

Data utilization: At this ultimate step, data is being utilized to back corporate activities and enhance operational efficiencies and productivity for the growth of business. This makes the corporate decision making really 'data driven'.



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Question 10.

**“Data Analytics is the science of evaluating unprocessed data sets to get some conclusions.”
In the context of the given statement, briefly explain the steps of Data Analytics.**

(Dec. 23, Dec. 25)

Answer 10

Data analytics is the science of evaluating unprocessed datasets to draw conclusions about the information they contain. It helps us to identify patterns in the raw data and extract useful information from them. Applications containing machine learning algorithms, simulation, and automated systems may be utilized by data analytics procedures and methodologies.

Steps of data analytics: -

Following are the steps for data analytics:

- **Criteria for grouping data:** Data may be segmented by a variety of parameters, including age, population, income, and sex. The data values might be either numeric or category.
- **Collecting the data:** Data may be gathered from several sources, including internet sources, computers, personnel, and community.
- **Organizing the data:** After collecting the data, it must be arranged so that it can be analyzed. Statistical data can be organized on a spread sheet or other program capable of handling statistical data.
- **Cleaning the data:** The data is initially cleansed to verify that there are no duplicates or errors.

The document is then examined to ensure that it is comprehensive. Before data is sent to a data analyst for analysis, it is beneficial to rectify or eliminate any errors by cleaning the data. Adopt the right type of data analytics approach like Descriptive analytics, Diagnostics analytics, Predictive analytics & Prescriptive analytics which helps the company in streamlining their processes, conserving resources and increasing their profitability.

Question 11.

Briefly describe the primary functions of commercial banks in India.

(June 24)

Answer 11

The primary functions (also known as banking functions) of commercial banks in India are:

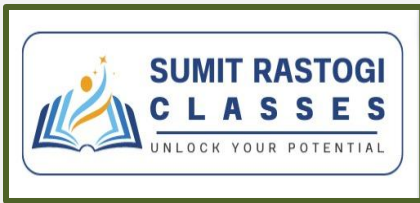
(a) Acceptance of Deposits from Public: Bank accepts following deposits from public:

- (i) Demand deposits can be in the form of current account or savings account. These deposits are withdrawable any time by depositors by cheques. Current deposits have no interest or nominal interest.

Such accounts are maintained by commercial firms and businessman. Interest rate of saving deposits varies with time. Savings accounts are maintained for encouraging savings of households.

- (ii) Fixed deposits are those deposits which are withdrawable only after a specific period. It earns a higher rate of interest.

- (iii) In recurring deposits, people deposit a fixed sum every month for a fixed period.



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(b) Advancing Loans: It extends loans and advances out of money deposited by public to various business units and to consumers against some approved. Usually, banks grant short-term or medium-term loans to meet requirements of working capital of industrial units and trading units. Banks discourage loans for consumption purposes. Loans may be secured or unsecured. Banks do not give loans in form of cash. They make the customer open account and transfer loan amount into the customer's account.

Banks grant loan in following ways: –

- (i) Overdraft
- (ii) Cash Credit
- (iii) Discounting Trade Bills
- (iv) Term Loan
- (v) Consumer Credit
- (vi) Money at Call or Short-term Advances

(c) Credit Creation: Credit creation is another banking function of commercial bank. i.e., it manufactures money.

(d) Use of Cheque System: Banks have introduced the cheque system for withdrawal of deposits. There are two types of cheques – bearer & cross cheque.

(e) Remittance of Funds: Banks provide facilities to remit funds from one place to another for their customers by issuing bank drafts, mail transfer etc.

Question 12.

‘The implementation of data mining in Finance and Management is one of the important segments of Business Data Analytics’. In this context, briefly illustrate the data mining applications. (June 24)

Answer 12

Utilizing data mining techniques, hidden patterns and future trends and behaviors in financial markets may be predicted. Typically, sophisticated statistical, mathematical, and artificial intelligence approaches are necessary for data mining, particularly for high-frequency financial data.

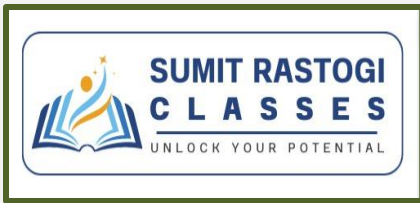
Among the data mining applications are:

(i) Detecting money laundering and other financial crimes:

Money laundering is the illegal conversion of black money to white money. In today's society, data mining techniques have advanced to the point where they are deemed suitable for detecting money laundering. The data mining methodology provides a mechanism for bank customers to detect or verify the detection of the anti-money laundering impact.

(ii) Prediction of loan repayment and customer credit policy analysis:

Loan Distribution is the core business function of every bank. The loan Prediction system automatically computes the size of the characteristics it employs and examines data pertaining to its size. Consequently, data mining aids in the management of all critical data and massive databases by utilizing its models.



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(iii) Target marketing:

Together, data mining and marketing work to target a certain market, and they also assist and determine market decisions. With data mining, it is possible to keep earnings, margins, etc. and determine which product is optimal for various types of customers.

(iv) Design and construction of data warehouses:

The business can retrieve or move the data into several huge data warehouses, allowing a vast volume of data to be correctly and reliably evaluated with the aid of various data mining methodologies and techniques. It also examines a vast number of transactions.

Question 13.

Data plays a very important role in the study of finance and cost accounting. Explain the various ways of classifying the types of data. (June 24)

Answer 13

There are different ways data can be classified. These are –

- (a) Quantitative financial data:** By the term „quantitative data“, we mean the data expressed in numbers. The stock price data, financial statements etc. are examples of quantitative data.
- (b) Qualitative financial data:** However, some data in financial studies may appear in a qualitative format e.g. text, videos, audio etc. These types of data may be very useful for financial analysis. For example, the „management discussion and analysis“ presented as part of annual report of a company is mostly presented in the form of text.

There is another way of classifying the types of data. The data may be classified also as:

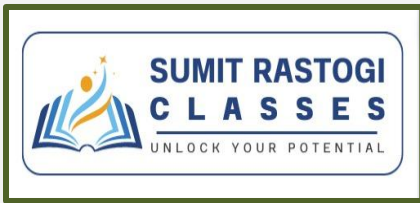
- (i)** Nominal
- (ii)** Ordinal
- (iii)** Interval
- (iv)** Ratio

The differentiation between the four scale types is based on three basic characteristics:

- (a)** Whether the sequence of answers matters or not
- (b)** Whether the gap between observations is significant or interpretable, and
- (c)** The existence or presence of a genuine zero.

These types are discussed below:

- (i) Nominal Scale:** Nominal scale is being used for categorizing data. The category labels may contain numbers but have no numerical value. Examples could be, classifying equities into small-cap, mid-cap, and large-cap categories or classifying funds as equity funds, debt funds, and balanced funds etc.
- (ii) Ordinal Scale:** Ordinal scale is being used for classifying and put it in order. The numbers just indicate an order. They do not specify how much better or worse a stock is at a specific price compared to one with a lower price. For example, the top 10 stocks by P/E ratio.



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- (iii) **Interval scale:** Interval scale is used for categorizing and ranking using an equal interval scale. Equal intervals separate neighboring scale values. The temperature of 40 degrees is 5 degrees higher than that of 35 degrees. The issue is that a temperature of 0 degrees Celsius does not indicate the absence of temperature.
- (iv) **Ratio scale:** The ratio scale possesses all characteristics of the nominal, ordinal, and interval scales. The acquired data can not only be classified and rated on a ratio scale but also have equal intervals. A ratio scale has a true zero. For example, length, time, mass, money, age, etc. are typical examples of ratio scales.

Question 14.

Describe the steps to include in report design.

(June 24, June 26)

Answer 14

There are few strategic steps to include Data Visualization in report design, as mentioned below:

- **Find a story in the data**

Data-driven storytelling is a powerful tool. Finding a story that connects with the reader can help to create an effective report. It's also not that hard as it looks. In order to locate the story, one must arrange the data, identify any missing numbers, and then check for outliers. One may then view the data and examine the link between factors.

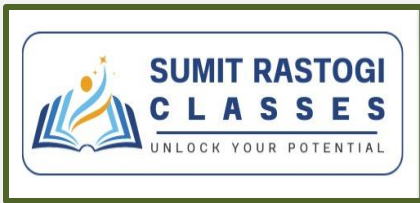
- **Create a narrative**

When some individuals hear the term "data storytelling," they believe that it consists of a few statistics and that the task is complete. This is a frequent misconception that is false. Strong data storytelling comprises an engaging narrative that takes the audience through the facts and aids in their comprehension. Moreover, an explanation of the significance of these ideas is essential. To compose an excellent story, one must.

- (i) Engage the viewer with a catchy title and sub-headings.
- (ii) Incorporate context into the data.
- (iii) Create a consistent and logical flow.
- (iv) Highlight significant discoveries and insights from the data.

- **Choose the most suitable data Visualization**

Data Visualization is not limited to the creation of charts and graphs. It involves presenting the facts in the most comprehensible chart possible. Applying basic design principles and utilizing features like form, size, color, and labelling may have a significant impact on how people comprehend the data. For instance, deciding the optimal number of slices for a pie chart or the space between bars in a bar graph. Knowing these tips may greatly improve the data visualizations.



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- **Follow the visual language**

The report design may be for internal or external consumption. Despite this, one should develop material consistently with the company's style guide. It is essential to adhere to data visualization principles in order to achieve both uniformity and comprehension. A strategic methodology assists in implementation.

- **Publicize the report**

Some reports are not intended for public consumption. However, since they include so much essential information, they may contain knowledge that is of interest to individuals or media outside of the business.

Question 15.

What are the principal features of a commercial paper? Discuss the advantages offered by commercial paper to its issuers. (Dec. 24)

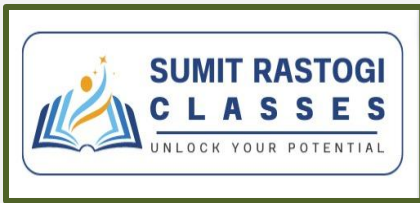
Answer 15

The principal features of commercial papers are:

- (i) Commercial paper (CP) is an unsecured short-term promissory note, negotiable and transferable by endorsement and delivery with a fixed maturity period.
- (ii) It is issued only by large, well-known, creditworthy companies and is typically unsecured, issued at a discount on face value, and redeemable at its face value.
- (iii) The aim of its issuance is to provide liquidity or finance company's investments, e.g., in inventory and accounts receivable.

The advantages of commercial papers are:

- (i) **Simplicity:** Documentation involved in issue of Commercial Paper is simple and minimum.
- (ii) **Cash Flow Management:** The issuer company can issue Commercial Paper with suitable maturity periods (not exceeding one year), tailored to match the cash flows of the Company.
- (iii) **Alternative for Bank Finance:** A well-rated company can diversify its sources of finance from Banks to short-term money markets, at relatively cheaper cost.
- (iv) **Returns to Investors:** CP's provide investors with higher returns than the banking system.
- (v) **Incentive for Financial Strength:** Companies which raise funds through CP become well-known in the financial world for their strengths. They are placed in a more favorable position for raising long-term capital also. So, there is an inbuilt incentive for Companies to remain financially strong.



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Question 16.

What do you mean by Descriptive Analytics? Explain the information revealed by Descriptive Analytics. (Dec. 24)

Answer 16

Descriptive analytics is a frequently employed style of data analysis in which historical data is collected, organized, and presented in a readily digestible format. Descriptive analytics focus exclusively on what has already occurred in an organization and, unlike other types of analysis, do not utilize its results to draw inferences or make forecasts. Rather, descriptive analytics serves as a basic starting point to inform or prepare data for subsequent analysis. With the use of visual tools such as line graphs, pie charts, and bar charts to communicate data, descriptive analytics can and should be readily understood by a broad corporate audience.

An organization uses descriptive analytics regularly in its day-to-day operations. Examples of descriptive analytics that give a historical overview of an organization's activities include company reports on inventory, workflow, sales, and revenue. These types of reports collect data that can be readily aggregated and utilized to provide snapshots of an organization's activities.

Social analytics are virtually always a type of descriptive analytics. The number of followers, likes, and posts may be utilized to calculate, for example, the average number of replies per post, page visits, and response time. Facebook and Instagram comments are additional instances of descriptive analytics that may be utilized to better comprehend user sentiments.

However, descriptive analytics do not seek to go beyond the surface data and analysis; extra inquiry falls outside the scope of descriptive analytics, and conclusions and predictions are not derived from descriptive analysis. Nevertheless, this research can show patterns and significance by comparing historical data. An annual income report, for instance, may look financially encouraging until it is compared against the same report from past years, which reveals a declining trend.

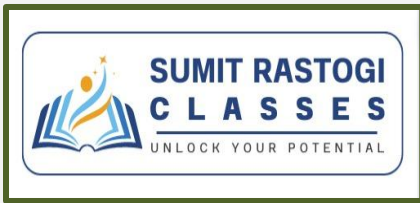
Question 17.

What is Business Intelligence (BI)? List the procedures to which the use of BI has expanded. (Dec. 24)

Answer 17

Business intelligence includes business analytics, data mining, data visualization, data tools and infrastructure, and best practices to assist businesses in making choices that are more data driven. When you have a complete picture of your organization's data and utilize it to drive change, remove inefficiencies, and swiftly adjust to market or supply changes, you have contemporary business intelligence. Modern BI systems promote adaptable self- service analysis, controlled data on dependable platforms, empowered business users, and rapid insight delivery.

In recent years, business intelligence has expanded to incorporate more procedures and activities designed to enhance performance. These procedures consist of:



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1. **Data mining:** Large datasets may be mined for patterns using databases, analytics, and machine learning (ML).
2. **Reporting:** The dissemination of data analysis to stakeholders in order for them to form conclusions and make decisions.
3. **Performance metrics and benchmarking:** Comparing current performance data to previous performance data in order to measure performance versus objectives, generally utilizing customized dashboards.
4. **Descriptive analytics:** Utilizing basic data analysis to determine what transpired
5. **Querying:** BI extracts responses from data sets in response to data-specific queries.
6. **Statistical analysis:** Taking the results of descriptive analytics and using statistics to further explore the data, such as how and why this pattern occurred.
7. **Data Visualization:** Data consumption is facilitated by transforming data analysis into visual representations such as charts, graphs, and histograms.
8. **Visual Analysis:** Exploring data using visual storytelling to share findings in real-time and maintain the flow of analysis.
9. **Data Preparation:** Multiple data source compilation, dimension and measurement identification, and data analysis preparation.

Question 18.

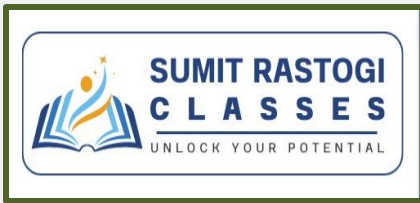
Explain the concept of Predictive Analytics. How does Predictive Analytics work? Give two examples of application of Predictive Analytics in specific industries. (June 25)

Answer 18

Predictive analytics, as implied by its name, focuses on forecasting and understanding what might occur in the future, whereas descriptive analytics focuses on previous data. By analyzing past data patterns and trends by examining historical data and customer insights, it is possible to predict what may occur in the future and, as a result, many aspects of a business can be informed, such as setting realistic goals, executing effective planning, managing performance goals, and avoiding risks.

The foundation of predictive analytics is probability. Using techniques such as data mining, statistical modelling (mathematical relationships between variables to predict outcomes), and machine learning algorithms (classification, regression, and clustering techniques), predictive analytics attempts to predict possible future outcomes and the probability of those events. To create predictions, machine learning algorithms, for instance, utilize current data and make the best feasible assumptions to fill in missing data.

Deep learning is a more recent subfield of machine learning that imitates the building of “human brain networks as layers of nodes that understand a specific process area but are networked together to provide an overall forecast.” Credit scoring utilizing social and environmental data and the sorting of digital medical pictures such as X-rays to automated predictions for doctors to use in diagnosing patients are instances of deep learning.



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This methodology enables executives and managers to take a more proactive, data-driven approach to corporate planning and decision-making, given that predictive analytics may provide insight into what may occur in the future. Utilizing predictive analytics, businesses may foresee customer behavior and purchase patterns, as well as discover sales trends. Predictions can also assist in forecasting supply chain, operations, and inventory demand.

Following are the applications of predictive analytics:

- **E-commerce** – anticipating client preferences and proposing items based on previous purchases and search histories
- **Sales** – estimating the possibility that a buyer will buy another item or depart the shop.
- **Human resources** – identifying employees who are contemplating resigning and urging them to remain.
- **IT security** – detecting potential security vulnerabilities requiring more investigation
- **Healthcare** – anticipating staffing and resource requirements

Question 19.

Describe the various phases of digitization process in an organization.

(June 25)

Answer 19

Large institutions take up digitization projects with meticulous planning and execution. The entire process of digitization may be segregated into six phases:

Phase 1: Justification of the proposed digitization project: -

At the very initiation of the digitization project, the actual benefit of the project needs to be identified. Also, one needs to compute the cost aspect of the project and the assessment of availability of resources. Risk assessment is an important part of project assessment.

Most importantly, the expected value generation through digitization should be expressed in clear terms.

Phase 2: Assessment: -

In any institution, all records are never digitized. The data that requires digitization is to be decided based on content and context. Some data may be digitized in a consolidated format, and some in detailed format. The files, tables, documents, expected future use etc. are to be accessed and evaluated for the assessment.

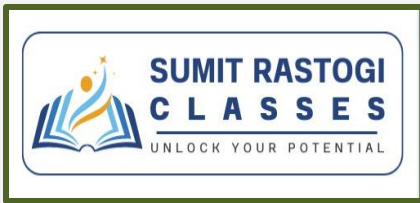
The hardware and software requirements for digitization is also assessed at this stage.

Phase 3: Planning: -

Successful execution of digitization project needs meticulous planning. There are several stages for planning e.g. selection of digitization approach, Project documentation, Resources management, technical specifications and Risk management

Phase 4: Digitization activities: -

Upon the completion of assessment and planning phase, the digitization activities start. The Wisconsin Historical Society developed a six-phase process viz. Planning, Capture, Primary quality control, Editing, Secondary quality control, and storage and management.



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Phase 5: Processes in the case of records: -

Once the digitization of records is complete, there are few additional requirements which may be linked to administration of records. The permission for accession of data, intellectual control (over data), classification (if necessary), and keeping and maintenance of data are few additional requirements for data management.

Phase 6: Evaluation: -

Once the digitization project is updated and implemented, the final phase should be a systematic determination of the project's merit, worth and significant using objective criteria. The primary purpose is to enable reflection and assist identify changes that would improve future digitization processes.

Question 20.

In the context of data processing, briefly explain, following steps:

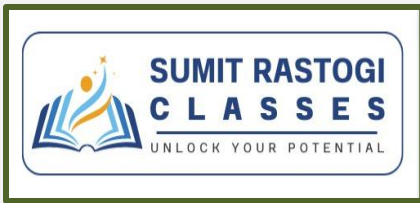
(June 25)

- (i) Validation
- (ii) Aggregation
- (iii) Analysis

Answer 20

The steps are explained below:

- (i) **Validation:** Data validation may be defined as 'An activity aimed at verifying whether the value of a data item comes from the given (finite or infinite) set of acceptable values. data validation leads to the acceptance or rejection of data as acceptable. Data is subjected to rules. Data are deemed legitimate for the intended final use if they comply with the rules, which means that the combination stated by the rules is not broken.
The objective of data validation is to ensure a particular degree of data quality. In official statistics, however, quality has multiple dimensions: relevance, correctness, timeliness and punctuality, accessibility and clarity, comparability, coherence, and comprehensiveness. Therefore, it is essential to determine which components data validation addresses.
- (ii) **Aggregation:** Data aggregation refers to any process in which data is collected and summarized. When data is aggregated, individual data rows, which are often compiled from several sources, are replaced with summaries or totals. Groups of observed aggregates are replaced with statistical summaries based on these observations. A data warehouse of ten contains aggregate data since it may offer answers to analytical inquiries and drastically cut the time required to query massive data sets.
A common application of data aggregation is to offer statistical analysis for groups of individuals and to provide relevant summary data for business analysis. Utilizing software tools known as data aggregators, large-scale data aggregation is commonplace. Typically, data aggregators comprise functions for gathering, processing, and displaying aggregated data.



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(iii) Analysis: Data analysis is described as the process of cleaning, converting, and modelling data to obtain actionable business intelligence. The objective of data analysis is to extract relevant information from data and make decisions based on this knowledge.

Every time we decide in our day-to-day life, we consider what occurred previously or what would occur if we chose a specific option. This is a simple example of data analysis. This is nothing more than studying the past or the future and basing judgments on that analysis. We do so by recalling our history or by imagining our future. That consists solely of data analysis. Now, the same task that an analyst does for commercial goals is known as Data Analysis.

Question 21.

What do you mean by the term 'Repo'? Discuss its features.

(Dec. 25)

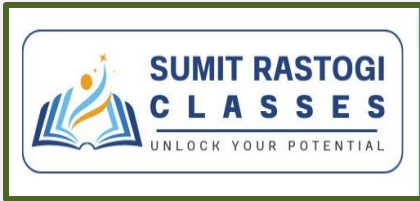
Answer 21

Meaning of Repo:

Repo or ready forward contract is an instrument for borrowing funds by selling securities with an agreement to repurchase the said securities on a mutually agreed future date at an agreed price which includes interest for the funds borrowed. Repo rate is the return earned on a repo transaction expressed as an annual interest rate.

Features of Repo:

- (i) Banks and primary dealers are allowed to undertake both repo and reverse repo transactions.
- (ii) It is a collateralized short-term lending and borrowing agreement.
- (iii) It serves as an outlet for deploying funds on short-term basis.
- (iv) The interest rates depend on the demand and supply of the short-term surplus/deficit amongst the interbank players.
- (v) In addition to T-Bills all Central and State Government securities are eligible for repo.
- (vi) No sale of securities should be affected unless the securities are actually held by the seller in his own investment portfolio.
- (vii) Immediately on sale, the corresponding amount should be reduced from the investment account of the seller.
- (viii) The securities under repo should be marked to market on the balance sheet.



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Question 22.

Briefly discuss the process of data mining.

(Dec. 25)

Answer 22

Data mining typically involves four steps as follows:

(i) Setting the business objective:

This might be the most difficult element in the data mining process, yet many organisations spend inadequate effort on it. Together, data scientists and business stakeholders must identify the business challenge, which informs the data queries and parameters for a specific project. Analysts may also need to conduct further study to adequately comprehend the company environment.

(ii) Preparation of data:

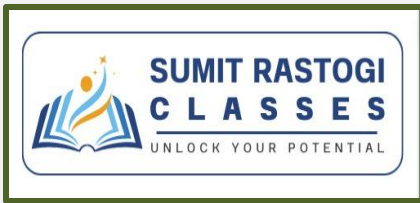
Once the scale of the problem has been established, it is simpler for data scientists to determine which collection of data will assist the company in answering crucial questions. Once the pertinent data has been collected, it will be cleansed by eliminating any noise, such as repetitions, missing numbers, and outliers. Based on the dataset, an extra step may be done to minimise the number of dimensions, as an excessive amount of features might slow down any further calculation. Data scientists seek to maintain the most essential predictors to guarantee optimal model accuracy.

(iii) Model building and pattern mining:

Data scientists may study any intriguing relationship between the data, such as frequent patterns, clustering algorithms, or correlations, depending on the sort of research. While high frequency patterns have larger applicability, data variations can often be more fascinating, exposing possible fraud areas. Depending on the available data, deep learning algorithms may also be utilised to categorise or cluster a data collection. If the input data is marked (i.e. supervised learning), a classification model may be used to categorise data, or a regression may be employed to forecast the probability of a specific assignment. If the dataset is unlabeled (i.e. unsupervised learning), the particular data points in the training set are compared to uncover underlying commonalities, then clustered based on those features.

(iv) Result evaluation and implementation of knowledge:

After aggregating the data, the findings must be analysed and understood. When completing results, they must be valid, original, practical, and comprehensible. When this criterion is satisfied, companies can execute new strategies based on this understanding, therefore attaining their intended goals.



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Question 23.

What do you mean by credit rating? Explain the process of credit rating. (June 2026)

Answer 23.

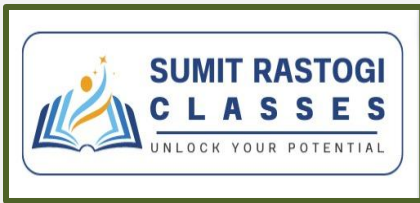
Credit rating is the assessment of a borrower's credit quality, it is the assessment carried out from the viewpoint of credit-risk evaluation on a specific date, on the quality of a:

- (i) Specific debt-security issued, or
- (ii) Obligation undertaken by an enterprise (Term Loans, etc.)

Process of Credit Rating:

The steps involved in the Credit Rating are:

- (1) **Rating Request:** The Customer (Prospective issuer of Debt Instrument) makes a formal request to the Rating Agency. The request spells out the terms of the rating assignment and contains analysis of the issues viz. historical performance, competitive position, business risk profile, business strategies, financial policies and evaluation of outlook for performance. Information requirements are met through various sources like references, reviews, experience, etc.
- (2) **Formation of Rating Team:** The rating process is initiated once a rating agreement is signed between Rating Agency and the client/on receipt of a formal request (or mandate) from the client. Then the credit rating agency forms a team, whose composition is based on the expertise and skills required for evaluating the business of the issuer. The client is then provided with a list of information required and the broad framework for discussions.
- (3) **Initial Analysis:** On the basis of the information gathered, the analysts submit the report to the Rating team. The authenticity and validity of the information submitted influences the credit rating activity.
- (4) **Evaluation by Rating Committee:** Rating Committee is the final authority for assigning ratings. The rating team makes a brief presentation about the issuers' business and the management. All the issues identified during discussions stage are analysed.
- (5) **Actual Rating:** Rating is assigned and all the issues which influence the rating, are clearly spelt out.
- (6) **Communication to Issuer:** Assigned rating together with the key issues is communicated to the issuer's top management for acceptance. The ratings, which are not accepted, are either rejected or reviewed. The rejected ratings are not disclosed and complete confidentiality is maintained.
- (7) **Review of Rating:** If the rating is not acceptable to the issuer, he has a right to appeal for a review of the rating. These reviews are usually taken up, only if the issuer provides fresh inputs on the issues that were considered for assigning the rating. Issuer's response is presented to the rating committee. If the inputs are convincing, the committee can revise the initial rating decision.
- (8) **Surveillance/Monitoring:** Credit rating agency monitors the accepted ratings over the tenure of the rated instrument. Ratings are reviewed every year, unless warranted earlier. During this course, the initial rating could be retained, upgraded or downgraded.



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Question 24.

"A judicious use of data analytics is essential for implementation of lean finance which implies optimizing finance processes with reduced cost and increased speed, flexibility and quality." - In this context, describe the abilities that a firm should achieve by transforming the information into a process for quality decision making. (June 2026)

Answer 24.

By transforming the information into a process for quality decision making, the firm should achieve the following abilities

- i. Logical understanding of a wide-ranging structured and unstructured data and put on that information to corporate planning, budgeting and forecasting and decision support.
- ii. Predict outcomes more effectively compared to conventional forecasting techniques based on historical financial reports.
- iii. Real time spotting of emerging opportunities and also capability gaps.
- iv. Making strategies for responding to uncertain events like market volatility and 'black swan' events through simulation.
- v. Diagnose, filter and excerpt value from financial and operational information for making better business decisions.
- vi. Recognize viable advantages to service customers in a better manner.
- vii. Identifying possible fraud possibilities on the basis of data analytics.
- viii. Building impressive and useful dashboards to measure and demonstrate success leading to effective strategies.

Question 25.

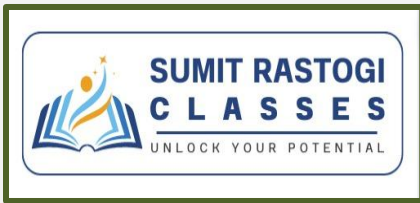
How does Prescriptive Analytics work? Explain its advantages and disadvantages.

(June 2026)

Answer 25.

Prescriptive Analytics

Descriptive analytics describes what has occurred, diagnostic analytics explore why it occurred, predictive analytics describes what could occur, and prescriptive analytics describes what should be done. This approach is the fourth, final, and most sophisticated step of the business analysis process, and it is the one that urges firms to action by assisting executives, managers, and operational personnel in making the most informed decisions possible based on the available data.



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Working of Prescriptive Analytics

- i. Prescriptive analytics goes one step farther than descriptive and predictive analysis by advising the best potential business actions.
- ii. This is the most sophisticated step of the business analytics process, needing significantly more specialised analytics expertise to execute; as a result, it is rarely utilised in daily company operations.
- iii. A multitude of approaches and tools-such as rules, statistics, and machine learning algorithms may be used to accessible data, including internal data (from within the business) and external data, in order to produce predictions and recommendations (such as data derived from social media). The capabilities of machine learning dwarf those of a human attempting to attain the same outcomes.
- iv. The widespread misconception is that predictive analytics and machine learning are same. While predictive analytics use historical data and statistical techniques to make predictions about the future, machine learning.
- v. A subset of artificial intelligence refers to a computer system's ability to understand large and often enormous amounts of data without explicit instructions, and to adapt and become increasingly intelligent as a result.
- vi. Predictive analytics predicts what, when, and, most importantly, why something may occur. After analysing the potential repercussions of each choice alternative, suggestions may be made regarding which options would best capitalise on future opportunities or reduce future hazards.
- vii. Prescriptive analytics predicts future outcomes and, by doing so, enable decision makers to assess the potential consequences for each future outcome. before making a choice.
- viii. Effectively conducted prescriptive analytics may have a significant impact on corporate strategy and decision making to enhance production, customer experience, and business success.

Advantages and disadvantages of prescriptive analytics:

- i. When utilised correctly prescriptive analytics gives important insights for making the most optimal data-driven decisions to optimise corporate performance.
- ii. Nonetheless, similar to predictive analytics, this technique requires enormous volumes of data to deliver effective findings, which is not always the case.
- iii. In addition, the machine learning techniques frequently used in this study cannot consistently account for all external variables.
- iv. On the other hand, machine learning significantly minimises the likelihood of human mistakes.