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(IIBA - CBDA)

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### QUESTION 1

An organization's customers are categorized based on the amount of purchases completed over the last 12 months. The analytics team would like to ensure the accuracy of their survey results and decide to randomly select 500 customers to participate in a survey from this large pool of customers. This is an example of:

- A. Stratified sampling
- B. Quota sampling
- C. Purposive sampling
- D. Snowball sampling

Correct Answer: A

Stratified sampling is a technique that divides the population into homogeneous subgroups (strata) based on a relevant characteristic, such as the amount of purchases, and then randomly selects a proportional number of elements from each subgroup to form the sample. Stratified sampling ensures that the sample is representative of the population and reduces the sampling error and bias

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### QUESTION 2

After completing their data analysis, an analyst is drawing out the results, explaining the methods and processes used, and identifying any limitations or weaknesses in the data or methods applied. While performing these steps, which recommended practice would the analyst apply?

- A. Use exploratory analysis to determine the best mathematical method to use
- B. Understand the communication needs of stakeholders
- C. Let the data drive the conclusions and the insights reached
- D. Learn a variety of visualization techniques for effective communications

Correct Answer: B

According to the IIBA's Guide to Business Data Analytics, communication is a key skill for analysts, as it involves conveying the results, methods, and limitations of the data analysis to various stakeholders in a clear, concise, and meaningful way. To communicate effectively, analysts need to understand the communication needs of stakeholders, such as their level of interest, knowledge, and influence, their preferred format and frequency of communication, and their expectations and objectives. By understanding the communication needs of stakeholders, analysts can tailor their messages, choose the appropriate language and tone, and select the most suitable communication channels and media. Therefore, the correct answer is B, as understanding the communication needs of stakeholders is a recommended practice for analysts while performing the steps of drawing out the results, explaining the methods and processes used, and identifying any limitations or weaknesses in the data or methods applied.

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### QUESTION 3

A job satisfaction survey is being developed. Half of the employees will be asked the question "Do you enjoy working in your workplace?" The other half will be asked "Do you like the current work benefits?". The business analyst raises

concern over the survey. What is concerning to the business analyst?

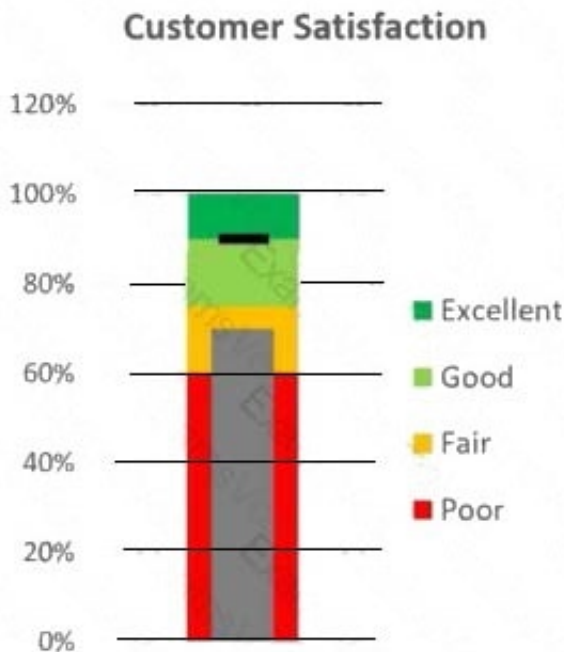
- A. Precision
- B. Reproducibility
- C. Reliability
- D. Validity

Correct Answer: D

The business analyst is concerned about the validity of the survey. Validity is the extent to which a survey measures what it intends to measure. In this case, the survey is supposed to measure job satisfaction, but the two questions asked to different groups of employees are not equivalent or relevant to this construct. The question "Do you enjoy working in your workplace?" is more directly related to job satisfaction than the question "Do you like the current work benefits?". The latter question may capture only one aspect of job satisfaction, and may not reflect the overall level of contentment or happiness with the job. Therefore, the survey results may not be valid or accurate in measuring job satisfaction

#### QUESTION 4

An analyst at an organization has just learnt about bullet charts. For the latest dashboard, the analyst has decided to display the customer satisfaction rate from the latest 2018 customer survey results through a bullet chart while comparing it to the 2017 customer satisfaction rate. What can be gleaned from this chart?



Customer Satisfaction

120%

100%

80%

- A. The 2018 customer satisfaction rate is at 90%. between good and excellent, and exceeded its target of 70%
- B. The 2018 customer satisfaction rate is at 90%. between good and excellent
- C. The 2018 customer satisfaction rate was fair, at 70%, and did not reach its target of 90%
- D. The 2018 customer satisfaction rate is at 90%. between good and excellent, while the 2017 customer satisfaction rate was at 70%

Correct Answer: D

A bullet chart is a type of bar chart that shows progress towards a goal or performance against a reference line<sup>1</sup>. It consists of a bar representing the featured measure, a reference line denoting a target or threshold, and a background with qualitative ranges (such as poor, fair, good, excellent)<sup>2</sup>. In this case, the featured measure is the customer satisfaction rate for 2018, the reference line is the target of 70%, and the background ranges are 0-50% (poor), 50-70% (fair), 70-90% (good), and 90-120% (excellent). The chart also shows a thin black bar representing the customer satisfaction rate for 2017, which can be used for comparison. From the chart, we can see that the 2018 customer satisfaction rate is at 90%, which falls in the excellent range and exceeds the target of 70%. We can also see that the 2017 customer satisfaction rate was at 70%, which falls in the good range and meets the target. Therefore, the correct answer is D, as it summarizes both the 2018 and 2017 customer satisfaction rates and their relation to the target and the ranges.

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## QUESTION 5

An operations manager for a new hotel is in need of determining the optimum number of vans to purchase to shuttle guests to/from the airport. It will be necessary to determine the most efficient routes and schedule to follow to ensure guests do not experience excessive delays. Which business analytics technique would lend itself to supporting these types of business decisions?

- A. Linear programming
- B. Factor analysis
- C. Regression
- D. K-means Clustering

Correct Answer: A

Linear programming is a business analytics technique that can lend itself to supporting these types of business decisions. Linear programming is a mathematical method that optimizes the allocation of limited resources to achieve a desired objective, subject to a set of constraints<sup>1</sup>. Linear programming can help the operations manager to determine the optimum number of vans to purchase, the most efficient routes and schedule to follow, and the minimum cost or time to shuttle guests to/from the airport, by formulating a linear objective function and a system of linear inequalities that represent the relevant variables, parameters, and restrictions<sup>2</sup>.

The other options are not correct business analytics techniques for these types of business decisions. Factor analysis is a statistical method that reduces the dimensionality of a large set of correlated variables into a smaller set of uncorrelated factors that explain the underlying structure or patterns of the data<sup>3</sup>. Factor analysis can help the operations manager to identify the key factors that influence the guest satisfaction or loyalty, but it cannot help to optimize the resource allocation or efficiency. Regression is a statistical method that estimates the relationship between

one or more independent variables and a dependent variable. Regression can help the operations manager to predict the demand or revenue of the hotel based on the variables such as season, price, or location, but it cannot help to optimize the resource allocation or efficiency. K-means clustering is a machine learning method that partitions a set of data points into a predefined number of clusters based on the similarity or distance between the data points. K-means clustering can help the operations manager to segment the guests into different groups based on their characteristics or preferences, but it cannot help to optimize the resource allocation or efficiency.

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### QUESTION 6

An analytics team has been asked to answer the following question: "Given that you're a customer, would you work at our company?" The team is concerned about answering this question because it is:

- A. Insignificant
- B. Short
- C. Unethical
- D. Unclear

Correct Answer: D

The question "Given that you're a customer, would you work at our company?" is unclear, because it is a hypothetical and subjective question that does not specify the purpose, scope, or context of the analysis. The question also does not define what constitutes a customer, or how the customer's experience or satisfaction relates to the employee's motivation or performance. The question needs to be refined and clarified to make it more focused, relevant, and feasible for the

analytics team to answer. For example, the question could be rephrased as "How does the customer satisfaction score affect the employee retention rate in our company?"

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### QUESTION 7

The architecture team puts forth a solution architecture that integrates multiple data sources from within and outside the organization. The architecture provides the foundation to source a new analytics program. If one of the objectives of the analytics team was to provide "one source of the truth", this objective would be referring to which of the following?

- A. Identifying one key stakeholder, who can make final decisions about which sources to relate/merge
- B. Evaluating the completeness, validity, and reliability of the data from source systems
- C. Ensuring stakeholders always have clear insight into the final requirements at all times
- D. Enforcing master data management principles and practices

Correct Answer: D

Providing "one source of the truth" means ensuring that there is a single, consistent, and authoritative source of data that can be used for analytics and decision making across the organization. This objective can be achieved by enforcing master data management principles and practices, which involve defining, governing, and maintaining the quality and integrity of the core data entities that are shared by multiple systems and processes. Master data management helps to eliminate data silos, reduce data duplication and inconsistency, and improve data accuracy and reliability

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### QUESTION 8

A business analyst constructs a model they would like to review with key business stakeholders but decides to review the model first with the data scientist who has performed the data analysis. The data scientist provides some suggestions on how to reduce the complexity in the model. One suggestion is to use color to group objects needing to be associated. The data scientist is encouraging using which Gestalt Principle of Perception with regards to data visualization?

- A. Connection
- B. Proximity
- C. Similarity
- D. Enclosure

Correct Answer: C

The data scientist is encouraging using the Gestalt Principle of Similarity with regards to data visualization. This principle states that the brain groups objects together that are similar in appearance, such as color, shape, size, or orientation. By using color to group objects needing to be associated, the data scientist is suggesting a way to reduce the complexity in the model and make it easier for the viewers to perceive the patterns and relationships among the data

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### QUESTION 9

An analytics team has completed some initial data analysis but is considering revising their research question based on their analysis findings. The team was concerned the original question was too broad. What outcome would lead the team to have this concern?

- A. Data once analyzed had significant data quality issues
- B. Data the team had planned to use was not available
- C. Difficult to identify the KPIs to measure
- D. The source data sets could not be merged

Correct Answer: C

A research question is a clear and focused question that guides the data analytics process and defines the expected outcome or value of the analysis<sup>1</sup>. A research question that is too broad may lead to the concern of being difficult to identify the key performance indicators (KPIs) to measure, as KPIs are specific, quantifiable, and relevant metrics that indicate the progress and success of the analysis in relation to the research question<sup>23</sup>. A broad research question may also result in too much or too little data, unclear or conflicting objectives, or irrelevant or ambiguous results

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### QUESTION 10

To support their recommendation, the analytics team has identified investment and resources required to implement. The team has also identified key activities and events that are required to transition the organization through various stages to the future state. This information is clearly articulated in the:

- A. Risk assessment
- B. Gap analysis
- C. Change strategy
- D. Gantt chart

Correct Answer: C

According to the Guide to Business Data Analytics, a change strategy is a document that outlines the approach and plan for managing the change resulting from the data analysis and the proposed solution. A change strategy should include the following elements: the vision and objectives of the change, the scope and impact of the change, the stakeholders and their roles and responsibilities, the communication and engagement plan, the training and development plan, the transition and implementation plan, the risk and issue management plan, and the evaluation and measurement plan. A change strategy can help ensure that the change is aligned with the business goals, that the stakeholders are informed and involved, that the risks and issues are identified and mitigated, and that the benefits and outcomes are realized and sustained.

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#### QUESTION 11

A job satisfaction study is being considered. Half of the employees of the company will be interviewed by senior managers and the other half of the employees will be interviewed by an external market research company, using the same set of questions. Which of the following might be a concern for using this approach to collect study data?

- A. Reliability
- B. Validity
- C. Timeliness
- D. Precision

Correct Answer: A

Reliability is the degree to which a data collection method produces consistent results under the same conditions<sup>1</sup>. In this case, the reliability of the study data might be compromised by the different interviewers (senior managers vs. external market research company), who might have different biases, expectations, or rapport with the employees. This could affect how the employees respond to the same set of questions, and thus introduce variability in the data. Validity, timeliness, and precision are not directly affected by the choice of interviewers, as they depend more on the quality, relevance, and accuracy of the questions and the data analysis.

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#### QUESTION 12

When reviewing the results of their analysis, the team is determining if the data supports their hypothesis and can be presented to decision makers. They are reviewing measures of variation, sample size and statistical significance. They realize that the p-value of 0.02 is lower than the initial target. This clearly indicates the team can:

- A. Accept the null hypothesis and accept the alternative
- B. Accept the null hypothesis and reject the alternative
- C. Reject the null hypothesis in favor of the alternative

D. Reject the null hypothesis and reject the alternative

Correct Answer: C

According to the Guide to Business Data Analytics, a p-value is the probability of obtaining a test statistic at least as extreme as the one observed, assuming that the null hypothesis is true. A p-value is used to make conclusions in hypothesis testing by comparing it to a significance level, which is the maximum probability of making a type I error (rejecting the null hypothesis when it is true). If the p-value is less than or equal to the significance level, then there is strong evidence against the null hypothesis and it is rejected in favor of the alternative hypothesis. If the p-value is greater than the significance level, then there is weak evidence against the null hypothesis and it is not rejected. In this situation, the team realizes that the p-value of 0.02 is lower than the initial target, which means that the probability of observing such a result under the null hypothesis is very low. This clearly indicates that the team can reject the null hypothesis in favor of the alternative hypothesis, as there is sufficient evidence to support their hypothesis.