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University Examinations 2023/2024

**SECOND YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF
BACHELOR OF SCIENCE DATA SCIENCE**

CDS 3252: DATA ANALYTICS AND VISUALIZATION

DATE: APRIL 2024

TIME: 2 HOURS

INSTRUCTIONS: *Answer question **one** and any other **two** questions*

QUESTION ONE (30 MARKS)

- a) Define the following terms
 - i) Data analytics. (2 marks)
 - ii) Data visualization (2 marks)
- b) Briefly discuss the purpose of Exploratory Data Analysis (EDA) in the data analytics process (6 Marks)
- c) Briefly outline four examples of machine learning algorithms that are used in data analytics. (6 marks)
- d) Distinguish between a histogram and a vertical bar chart giving examples where each the two visualizations can be applicable (4 Marks)
- e) Outline the information that can be obtained after visualizing a data series using a box-plot. (5 marks)



MUST is ISO 9001:2015 and



ISO/IEC 27001:2013 CERTIFIED

- f) Identify any five technological advancements that are expected to shape future information visualization and visual analytics. (5 marks)

QUESTION TWO (20 MARKS)

- a) Understanding the data lays the foundation for subsequent steps in data analytics and visualization. Discuss the techniques that a data scientist should employ in order to gain understanding of data to be used for visualization. (10 marks)
- b) Managing data analytics projects comes with its own set of challenges and pitfalls. AS a data scientist, discuss any five challenges that are encountered while managing data science projects. (10 Marks)

QUESTION THREE (20 MARKS)

- a) In the recent past, several developments have significantly contributed to organizations adopting a data-driven approach to decision making and in their operations. Discuss any five enabling technologies that have impacted data analytics positively. (10 Marks)
- b) Discuss the CRISP-DM methodology and its significance in data analytics. (10 marks)

QUESTION FOUR (20 MARKS)

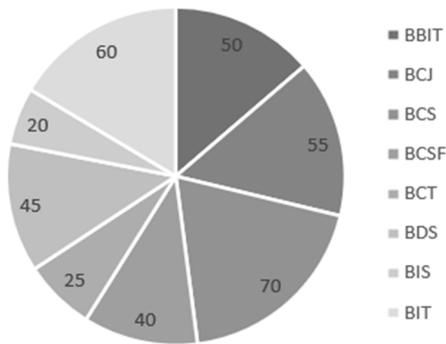
- a) Explain the differences between static and interactive visualizations. (8 marks)
- b) Using relevant examples, describe the differences between descriptive, diagnostic, predictive, and prescriptive analytics. (12 marks)

QUESTION FIVE (20 MARKS)

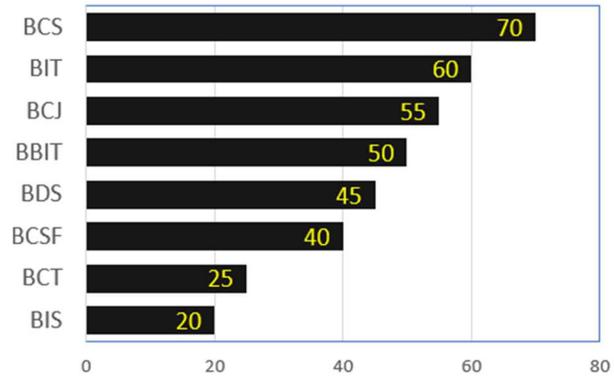
- a) Discuss the various challenges associated with big data analytics. (8 marks)
- b) The two visualizations below represent the distribution of new students in admitted into the programs offered in the school of computing in XYZ University.



Visualization



Visualization



Apply the theories of human visual perception and cognition to discuss whether each the visualization helps to;

- i) Clearly indicate the nature of the relationship (3 Marks)
- ii) Represents the quantities accurately (3 Marks)
- iii) Makes it easy to compare the quantities (3 Marks)
- iv) Makes it easy to see the ranked order of values (3 Marks)

