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Course :- Data Visualization.

Slot :- A21 + A22 + A23 + A24

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MID TERM

Qu:-

Ans. Preattentive processing occurs without our consciousness at an extremely high speed. It is turned to detect a specific set of visual attributes called Preattentive ~~Process~~ attributes

There are various preattentive visual properties

1) Color :-

Color can be expressed in many different ways. Like the RGB scale, CMYK scale and HSL scale.

The HSL scale is ~~a~~ useful to us when we examine color in term of preattentiveness.

2) Movement :-

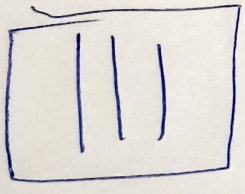
Movement has two sub attributes flickers and motion. They can be used very effectively to call someone's attention. However, care should always be taken when employing motion is information visualization and other designs.

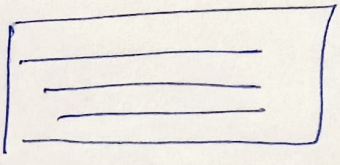
3) Form :-

Form applies to set of attributes and Form can be manipulated to either call attention to a member of the data-set or to reduce our attention on it

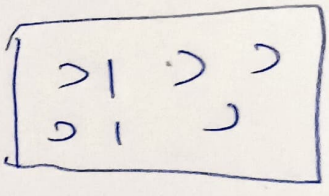
There are various Form attributes like.

Length, breadth width

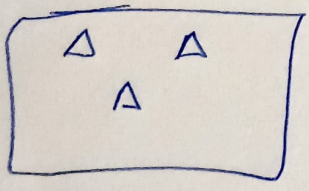




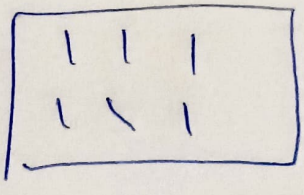
Curvature



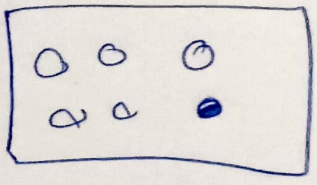
Shape



orientation



Marks



Q 2(a)

Defining the problem :-

1 The first step is to define the problem that our information visualization will solve. This will requires answers to the 5W's Question, who, what, when, where, Why and How. "Who are my users?". What does the user want from this?". "When are they likely to use this?". "Where are the users when they do this?". "Why will they use this instead of that? How will they do this?"

(ii)

We have to know the type of data we will use the data can be categorized into three main parts which also determine how they are mapped

① Quantitative data — the data which is numerical

Ordinal data - The data which doesn't have numbers

3

Dimensions has to deal with the number of attributes our data-set has, the more dimensions that are represented in the data - the more confusing it can be visualization. we need to simplify understanding of data, either numerically or visually to maintain data integrity.

4.

we need to analyse the data format for organizing storing the data and how they relate with each other. Some relationship structures are;

- Linear relationships: data that can be shown in linear formats such as tables etc
- Spatial relationships: data that relates to the real world (such as map data)
- Temporal relationships; where data change over the passage of time.
- Networked relationships; where the data relates to other entities within the same data
- Hierarchical relationships: data that relates to position in a defined hierarchy.

This part of the design process requires that we understand the level of interaction required by the user from the information visualization. "Should the user be able to transform or modify data?" Should the user control over the generation of views?". This questions will help us to categorize the interaction into any of these categories.

- Static models: these models are presented "as is" and cannot be altered by users. for ex. maps in a road Atlas that you keeps in a car.

Transformable models: these models enable the user to transform or modify data. They may allow the user to vary parameters for analysis or choose a different form of visual parameters for the data set.

Qu 2

(b)

Ans

Data types are broadly classified into two categories

(1) Quantitative Data

(2) Qualitative Data

(1) Quantitative Data :-

Any data where data generally represents amount ... such as height, weight, age of a person etc.

Quantitative Data is classified into two categories :-

(a) Discreate Data :-

Data that can be counted and has finite values is known as discreate data

(b) Continuous Data :-

Continuous data can be meaningfully split into smaller parts and assume any values

Qu.1

(II) Qualitative data :-

Any data where data generally represents groups. It simply consits of categorical variable that are used to represent characteristics such as a person's ranking, a person's gender etc.

These futhers classified into two categories

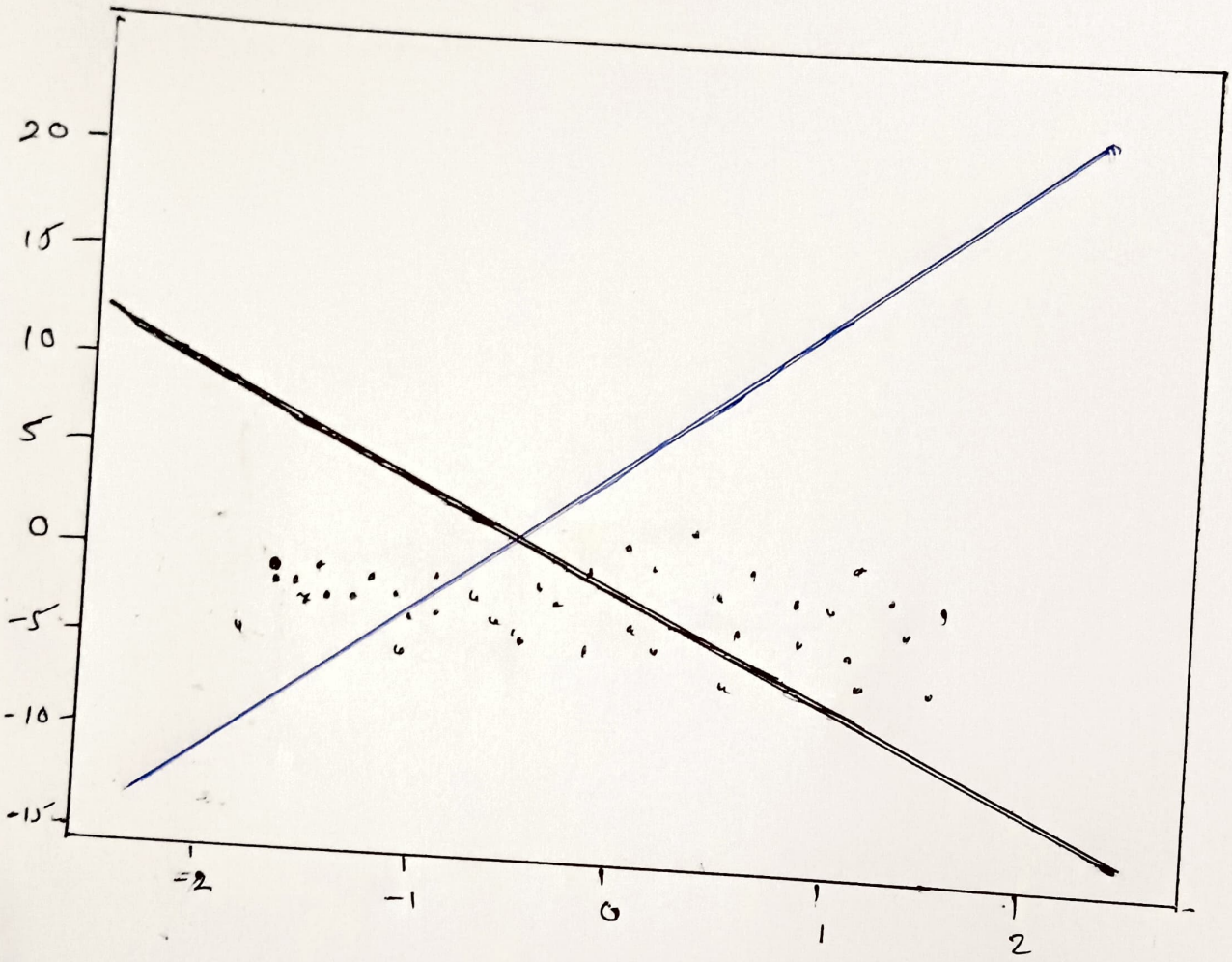
- Normal Data - In this, classification is based on attributes.

  Example :- Male or female

- Ordinal data :- In this classification is based on ordering of information.

  Example :- Timeline or processes

Qu.3
Ans



Qu.5

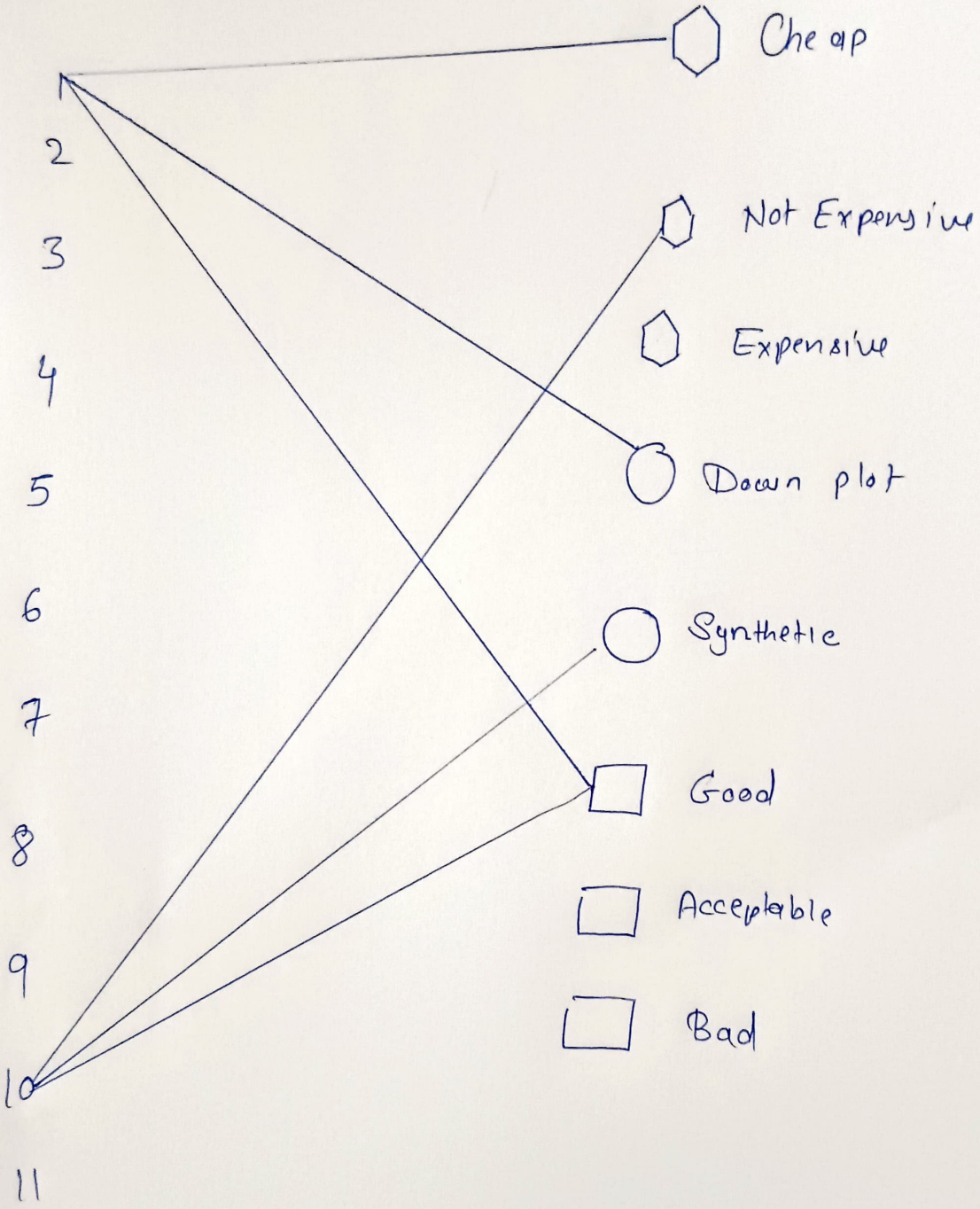
In the graph, we can see that the blue line shows a positive correlation the black line shows a negative correlation and dots show no relation with x values (it changes randomly independently)

1) If the value of y increase with the value of x, then we can say that the variables have positive correlation

2) If the value of y decreases with the value of x, the we can say that the variable have a negative correlation

3) If the value of y change randomly independently of x, then, it is said to have zero correlation.

Qu. 4


Cheap
Not Expensive
Expensive
Down plot
Synthetic
Good
Acceptable
Bad
2
3
4
5
6
7
8
9
10
11

Qu.5

Ans. Multivariate analysis is defined as the statistical study of data where multiple measurements are made on each experimental unit and where the relationships among multivariate measurements and ~~their~~ their structure are important

Multivariate statistical method incorporate several techniques depending on the situation and the question in focus. Some of these are :-

- Regression analysis :- Used to determine the relationship between a dependent variable and one or more independent variable

- Analysis of Variance :- Used to determine the relationship between collections of data by analyzing the difference in the means

Interdependent analysis :- Used to determine the relationship between a set of variables among themselv

Some more are:-

- Discriminate analysis
- Classification and cluster analysis
- Principal component analysis
- Factor analysis
- Canonical correlation analysis..

Multivariate analysis encompasses all statistical techniques that are used to analyze more than two variables at once.

There are many ~~different techniques for~~

Then All the techniques divide into two categories

- Dependence techniques
- Independence techniques

Dependence technique are used when one or some of the variable are dependent on others

Example the dependent variable of 'weight' might be predicted by independent variable such as 'height' and 'age'

In dependent techniques are used to understand the structural makeup and underlying patterns within a dataset. In this case no variable are dependent on others. so you are looking for casual relationships.