CMR INSTITUTE OF TECHNOLOGY

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Internal Assesment Test - 3

Sub:	**Research Methodology**							Code:	**20MBA23**
Date:	15-Sept-2022	Duration:	90 mins	Max Marks:	50	Sem:	II	Branch:	**MBA**

SET – 2

		Marks	OBE CO	OBE RBT
	Part A - Answer Any Two Full Questions (2* 20 = 40 marks)			
1 (a)	Write a short note on Thurston Scale?	[03]	CO2	L1
	The Thurston Scale is **a method used to measure and quantify the opinions or attitudes of people being surveyed, using a format of 'agree-disagree' questions**. The agree-disagree statements are assigned a numerical value by the researcher before beginning			
(b)	Illustrate different types of data analysis.	[07]	CO3	L3
	More and more, businesses are adopting sophisticated data analytics solutions with machine learning capabilities to make better business decisions and help determine market trends and opportunities. Organizations that do not start to use data analytics with proactive, future-casting capabilities may find business performance lacking because they lack the ability to uncover hidden patterns and gain other insights.			

Four main types of data analytics

1. Predictive data analytics

Predictive analytics may be the most commonly used category of data analytics. Businesses use predictive analytics to identify trends, correlations, and causation. The category can be further broken down into **predictive modeling** and **statistical modeling**; however, it's important to know that the two go hand in hand.

For example, an advertising campaign for t-shirts on Facebook could apply predictive analytics to determine how closely conversion rate correlates with a target audience's geographic area, income bracket, and interests. From there, predictive modeling could be used to analyze the statistics for two (or more) target audiences, and provide possible revenue values for each demographic.

2. Prescriptive data analytics

Prescriptive analytics is where AI and big data combine to help predict outcomes and identify what actions to take. This category of analytics can be further broken down into **optimization** and **random testing**. Using advancements in ML, prescriptive analytics can help answer questions such as

"What if we try this?" and "What is the best action?" You can test the correct variables and even suggest new variables that offer a higher chance of generating a positive outcome.

3. Diagnostic data analytics

While not as exciting as predicting the future, analyzing data from the past can serve an important purpose in guiding your business. Diagnostic data analytics is the process of examining data to understand cause and event or why something happened. Techniques such as drill down, data discovery, data mining, and correlations are often employed.

Diagnostic data analytics help answer why something occurred. Like the other categories, it too is broken down into two more specific categories: **discover and alerts** and **query and drill downs**. Query and drill downs are used to get more detail from a report. For example, a sales rep that closed significantly fewer deals one month. A drill down could show fewer workdays, due to a two-week vacation.

Discover and alerts notify of a potential issue before it occurs, for example, an alert about a lower amount of staff hours, which could result in a decrease in closed deals. You could also use diagnostic data analytics to "discover" information such as the most-qualified candidate for a new position at your company.

4. Descriptive data analytics

Descriptive analytics are the backbone of reporting—it's impossible to have business intelligence (BI) tools and dashboards without it. It addresses basic questions of "how many, when, where, and what."

Once again, descriptive analytics can be further separated into two categories: **ad hoc reporting** and **canned reports**. A canned report is one that has been designed previously and contains information around a given subject. An example of this is a monthly report sent by your ad agency or ad team that details performance metrics on your latest ad efforts.

Ad hoc reports, on the other hand, are designed by you and usually aren't scheduled. They are generated when there is a need to answer a specific business question. These reports are useful for obtaining more in-depth information about a specific query. An ad hoc report could focus on your corporate social media profile, examining the types of people who've liked your page and other industry pages, as well as other engagement and demographic information. Its hyperspecificity helps give a more complete picture of your social media audience. Chances are you won't need to view this type of report a second time (unless there's a major change to your audience).

(c)	Compose the main and subcomponents of a written research report.	[10]	CO3	L6

- Title page.

- Table of contents.
- Executive summary.
- Introduction.
- Discussion.
- Conclusion.
- Recommendations.
- References.

2 (a)	What is Hypothesis?	[03]	CO2	L1

A hypothesis is an assumption that is made based on some evidence. This is the initial point of any investigation that translates the research questions into predictions. It includes components like variables, population and the relation between the variables. A research hypothesis is a hypothesis that is used to test the relationship between two or more variables.

(b)	Classify charts and explain where they are appropriate in research.	[07]	CO3	L4

Types are classified into three independent types, i.e., bar graphs, pie charts and two-dimensional charts, the latter including line graphs, plots, and area graphs. Figure 2 shows a variety of example graphs used for experiments from these three categories.

Charts are powerful tools for visualizing and comparing data. Representation of information through charts grows with time due to its easy and aesthetically attractive structure. With the increase in the number of documents with various chart types, chart classification has become an important task for downstream applications such as chart data recovery, chart replenishment, etc. Though there have been various studies reported in the literature on chart classification using different classification methods, three of the important concerns are small dataset size, a small number of chart types, and inconsistencies in the performance reported in different studies. Motivated by the above concerns, this paper curates a large dataset of real chart images (110k samples) with a large number of chart types (24 charts types) and evaluates 21 different machine learning models. To the best of our knowledge, this is the largest (in sample size and chart types) real chart dataset reported in the literature to date. We further study - (i) the effect of dataset size on the classification model, (ii) the nature of chart noises and their influences on classification performance, and (iii) confusing chart pairs leading to misclassification.

(c)	Illustrate four primary scales of measurement used in business research.	[10]	CO3	L4

Nominal, Ordinal, Interval, and Ratio are defined as the four fundamental levels of measurement scales that are used to capture data in the form of surveys and questionnaires, each being a multiple choice question.

Each scale is an incremental level of measurement, meaning, each scale fulfills the function of the previous scale, and all survey question scales such as

Likert, Semantic Differential, Dichotomous, etc, are the derivation of this these 4 fundamental levels of variable measurement. Before we discuss all four levels of measurement scales in details, with examples, let's have a quick brief look at what these scales represent.

Nominal scale is a naming scale, where variables are simply "named" or labeled, with no specific order. Ordinal scale has all its variables in a specific order, beyond just naming them. Interval scale offers labels, order, as well as, a specific interval between each of its variable options. Ratio scale bears all the characteristics of an interval scale, in addition to that, it can also accommodate the value of "zero" on any of its variables.

Here's more of the four levels of measurement in research and statistics: Nominal, Ordinal, Interval, Ratio.

Nominal Scale, also called the categorical variable scale, is defined as a scale used for labeling variables into distinct classifications and doesn't involve a quantitative value or order. This scale is the simplest of the four variable measurement scales. Calculations done on these variables will be futile as there is no numerical value of the options.

There are cases where this scale is used for the purpose of classification – the numbers associated with variables of this scale are only tags for categorization or division. Calculations done on these numbers will be futile as they have no quantitative significance.

For a question such as:

Where do you live?

- 1- Suburbs
- 2- City
- 3- Town

Nominal scale is often used in research surveys and questionnaires where only variable labels hold significance.

For instance, a customer survey asking "Which brand of smartphones do you prefer?" Options : "Apple"- 1 , "Samsung"-2, "OnePlus"-3.

- In this survey question, only the names of the brands are significant for the researcher conducting consumer research or netnography. There is no need for any specific order for these brands. However, while capturing nominal data, researchers conduct analysis based on the associated labels.
- In the above example, when a survey respondent selects Apple as their preferred brand, the data entered and associated will be "1". This helped in quantifying and answering the final question – How many respondents selected Apple, how many selected Samsung, and how many went for OnePlus – and which one is the highest.
- This is the fundamental of quantitative research, and nominal scale is the most fundamental research scale.

Nominal Scale Data and Analysis

There are two primary ways in which nominal scale data can be collected:

By asking an open-ended question, the answers of which can be coded to a respective number of label decided by the researcher.

The other alternative to collect nominal data is to include a multiple choice question in which the answers will be labeled.

In both cases, the analysis of gathered data will happen using percentages or mode,i.e., the most common answer received for the question. It is possible for a single question to have more than one mode as it is possible for two common favorites can exist in a target population.

Nominal Scale Examples

- Gender
- Political preferences
- Place of residence

3 (a)	What is Chi-square test?	[03]	CO2	L1

The Chi-Square test is a statistical procedure for determining the difference between observed and expected data. This test can also be used to determine whether it correlates to the categorical variables in our data. It helps to find out whether a difference between two categorical variables is due to chance or a relationship between them.

(b)	Select different features of good research report.	[07]	CO3	L4

1. Good research is anchored on a sound research question.

A sound research question is one of the most important characteristics of good research. In 2010, Farrugia et al. proposed that developing a research question is the most important step in doing a research project.

A good research question details exactly what a researcher wants to learn and defines a study's scope. By formulating a good research question, researchers can ensure that they stay on track during the course of their study. In most cases, the research question influences the rest of the steps a researcher takes during his or her study as well.

However, the formulation of a research question is often easier said than done. As such, numerous frameworks–like the FINER and PICO criteria–have been invented to help researchers formulate sound research questions.

For instance, Cummings et al. (2013) suggest using FINER criteria to create or

	evaluate a research question. According to this set of criteria, a good research question is: • F – feasible • I – interesting • N – novel • E – ethical • R – relevant		
(c)	"A report is a written account of something that one has observed, heard, done, or investigated ". Justify the statement. [10]	CO4	L5
	Part B - Compulsory (01*10=10 marks)		
4	**Study the below case and aswer the questions.** Retail outlets can get into what is know as the death spiral. This is a vicious cycle in which the retail outlet keeps eliminating "non-profitabel" items/products. This in turn reduces the demand for certain items/products bought with the eliminated items/products. The out let lends to repeat its "elimination" round with a new set of items. Over a period of time, the outlet traffic is seriously affected to the extent that the profitability is also threatened. The following example will illustrtate the importance of the concept. Shoppers may buy bread regularly from an outlet along with other items. There are regular shoppers, but may form only about 15 percent of the total shoppers. The outlet my eliminate them from its marchandize without realizing that those 15 percent bread buyer also buy cheese, butter and jam. But eliminating there items, the story mayhave, infact, reduced its consumer traffic. These 15 percent shoppets may begin going to other stores. So not only does the traffic reduce but the profit also go down. Once in their vicious trap, the outlet may lose its conusmers besides, ofcourse the profits.		
	Create suitable title and develop research objetives and hypothesis. What test do you think it appropriate to test the hypothesis for the above case. [05]	CO4	L6

Course Outcomes		PO1	PO2	PO3	PO4	PO5
CO1:	Understand various research approaches, techniques and strategies in the appropriate in business.					
CO2:	Apply a range of quantitative / qualitative research techniques to business and day to day management problems.	1a,2a,3 a				
CO3:	Demonstrate knowledge and understanding of data analysis, interpretation and report writing.		2c, 3b		1b,1c, 2b	
CO4:	Develop necessary critical thinking skills in order to evaluate different research approaches in Business using excel in particular					3c,4

Cognitive level	KEYWORDS
L1 - Remember	list, define, tell, describe, recite, recall, identify, show, label, tabulate, quote, name, who, when, where, etc.
L2 - Understand	describe, explain, paraphrase, restate, associate, contrast, summarize, differentiate interpret, discuss
L3 - Apply	calculate, predict, apply, solve, illustrate, use, demonstrate, determine, model, experiment, show, examine, modify
L4 - Analyze	classify, outline, break down, categorize, analyze, diagram, illustrate, infer, select
L5 - Evaluate	asses, decide, choose, rank, grade, test, measure, defend, recommend, convince, select, judge, support, conclude, argue, justify, compare, summarize, evaluate
L6 - Create	design, formulate, build, invent, create, compose, generate, derive, modify, develop, integrate

PO1–*Theoretical Knowledge; PO2–Effective Communication Skills; PO3–Leadership Qualities; PO4 –Sustained Research Orientation; PO5 –Self-Sustaining Entrepreneurship*

CI **CCI** **HOD**