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Paper = Research methodology.

Q1 = Nine students take a test. Their scores out of 100 are, 50, 79, 70, 48, 90, 68, 89, 99, 77. Find out the Mean, Median and Mode of their scores?

Total Number of student = 9

Mean (Average) = 73.66567

Median (Middle) = 77

Mode (Most common) = So there is no mode in this data.

Q2 = write a short note on presentation of research data.

Presentation of Data:

This refers to the organization of data in to tables, graphs or charts, so that logical and statistical conclusion can be

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derived from the collected measurement.

Data may be presented in (3 Methods)

- Textual
- Tabular or
- Graphical.

### Textual Presentation

The data gathered are presented in paragraph form.

- Data are written and read.
- It is a combination of texts and figures.

### Tabular Presentation:-

• Method of presenting data using the statistical table.

- A systematic organization of data in columns and rows.

### Graphical Presentation:-

Kinds of graphs or Diagrams.



1 = Bar Graph - used to show relationships  
Comparison between groups.

2 = PIE OR CIRCLE GRAPH - shows percentage effectively.

3 = LINE GRAPH = most useful in displaying data that changes continuously over time.

4 = PICTO GRAPH: or pictogram: It uses small identical or figure of objects called istopes in making comparisons. Each picture represents a definite quantity.

Q3 = Differentiate between Relative risk and odd ratio with example?

Relative Risk:

Incidence in exposed individuals =  $a/a+b$   
OR Proportion of exposed people who developed the disease.

Incidence in non-exposed individuals  
=  $c/c+d$

OR Proportion of non exposed people who develop disease.

$$\text{Relative Risk} = \frac{\text{Incidence in exposed}}{\text{Incidence in non exposed}}$$

$$RR = \frac{a/a+b}{c/c+d}$$

example :-

	Disease status		
	CHD+	CHD-	Total
Smoker	112	176	288
Non smoker	88	224	312

Incidence in exposed =  $a/a+b = 112/288 = 0.38$

Incidence in non exposed =  $c/c+d = 88/312 = 0.28$

RR =  $0.38/0.28 = 1.38$

### Odds Ratio:-

Incidence can not be measured in case control studies because we start with the diseased people (cases) and non diseased people (controls) hence we calculate OR.

example:- Passive smoking and Breast Cancer.

	Breast cancer	No Breast Cancer	Total
Exposed (Passive smokers)	140 (a)	370 (b)	510
Not exposed	40 (c)	234 (d)	274



$$\text{odds} = 140/40 = 3.5$$

$$\text{odds} = 370/234 = 1.6$$

$$\text{OR} = 3.5 / 1.6 = 2.2$$

Compared to the control the odds of being a passive smoker are  $2.2 >$  in Ca breast cases.

Q5= what is hypothesis? Also explain different steps in testing of hypothesis?

Hypothesis:

A testable theory, or statement of belief used in evaluation of a population of interest e.g. Mean or Proportion.

Steps in hypothesis Testing:

1= statement of ~~research~~ research question in terms of statistical hypothesis (Null and alternate hypothesis).

2= selection of an appropriate level of significance. The significance level is the risk we are willing to take that a sample which showed a difference was misleading. 5% significance level means that we are ready to take 5% chance of wrong result.

3. choosing an appropriate statistics  
t test, z test for continuous  
data, chi square for proportion  
etc.

Test statistics is computed from  
the sample data and is used  
to determine whether the null  
hypothesis should be rejected or  
retained.

Test statistics generates p value.

p value: indicates the probability or  
likelihood of obtaining a result  
at least as extreme as that observed  
in a study by chance alone, assuming  
that there is truly no association  
between exposure and outcome under  
consideration.

By convention the p value is set  
at 0.05 level. Thus any value of  
p less than or equal to 0.05  
indicates that there is at most  
5% probability of observing  
an association as large or larger  
than that found in the study  
due to chance alone given that  
there is no association between  
exposure and outcome. If p value  
0.05 do not reject the null



hypothesis.

4 = performing calculations, and obtaining p value.

5 = Drawing conclusions rejecting null hypothesis if the p value is less than the set significance level.

Q4: what is meant by Prevalence in research? Also explain Point and Period Prevalence.

Prevalence:-

Prevalence quantifies the proportion of individual in a population who have the disease at a specific instant and provides an estimate of the probability (risk) that an individual will be ill at a point in time.

The formula for calculating the prevalence  

$$p = \frac{\text{number of existing cases of a disease}}{\text{total population}}$$

Point Prevalence:-

Prevalence can be thought of as the status of the disease in a population at a point in time and as such

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is also referred to as Point Prevalence.

This point can refer to a specific point in calendar time or to a fixed point in the course of events that varies in real time from person to person, such as the onset of menopause or puberty or the third postoperative day.

### Period Prevalence:

It represents the proportion of cases that exist within a population at any point during specified period of time.

The numerator thus includes cases that were present at the start of the period plus new cases that developed during this time.

E.g Frequency of Patients psychiatric Rx between May 31 - Dec 31 2008.