

ID:- 13636

Name:- Mr. Faizan

Paper:- Research Methodology

S M T W T F S

Date: \_\_\_\_\_

Q No:- 1

Nine students takes a test. Their scores out of 100 are: 50, 79, 70, 48, 90, 68, 89, 92, 77. Find the Mean, Median, and Mode of their scores?

Ans:-

① ⇒ Find out the Mean.

$$48, 50, 68, 70, 77, 79, 89, 90, 92 = \frac{663}{9}$$

$$\text{Mean} = \frac{663}{9} = \boxed{73.66} \Rightarrow \text{Mean}^9$$

② Mode = No Mode.

0 because there is no repetition of data in a set of given observation.

③ Median:-

$$\frac{n+1}{2} = \frac{9+1}{2}$$

= 5th term in given data.

$\boxed{77}$  ⇒ Median (when data is arranged in order of lowest to greatest).

Q No:- 2

Write a short note on presentation of research data?

Ans:-

Presentation of data this refers to the organization of data into tables, graphs or charts, so that logical and statistical conclusion can be derived from the collected measurements.

Tabular presentation Method of presentation data using the statistical table.

Q No: 3 Differentiate b/w Relative risk and odd ratio with example?

Ans:-  
① Relative risk.

• Incidence in exposed individuals  $s = a/a+b$  or proportion of exposed people who developed the disease.

• Incidence in non-exposed individuals  $s = c/c+d$  or proportion of non exposed people who develop disease.

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

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

example:-

	CHD+	CHD-	Total
Smoker	112	176	288
Nonsmoker	88	224	312

$$\text{Incidence in exposed} = a/a+b = 112/288 = 0.38$$

$$\text{Incidence in non exposed} = c/c+d = 88/312 = 0.28$$

$$RR = 0.38/0.28 = 1.38$$

② odds Ratio:-

Incidence cannot be measured in Case control studies because we start with the disease people (cases) and non diseased people (controls), hence we calculate or

~~Q~~ example:-

	Case	Control	
Exposed	a	b	a+b
Non exposed	c	d	c+d

$$OR = a/c / ~~a~~ b/d \text{ or } ad/bc.$$

			Total
Exposed	140 a	370 b	510
Non exposed	40 c	234 d	274

$$Odds = 140/40 = 3.5$$

$$Odds = 370/234 = 1.6$$

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

Compared to the control the odds of being a passive smoker are 2.2 in ~~ca~~ ca breast case.

Q No 4:-  
7

What is meant by prevalence in research? Also explain point and period prevalence.

Ans:-  
7

Prevalence:-

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

• The formula for calculating the prevalence  $P = \frac{\text{number of existing cases of a disease}}{\text{total population}}$  (at a given point in time).

→ Point prevalence:-

• prevalence can be thought of as the status of the disease in a population at a point in time and as such 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 a 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 receiving psychiatric Rx b/w May 31 - Dec 01 2008.

Q No-5 → What is Hypothesis? Also explain different steps in testing of Hypothesis.

Ans:- Hypothesis:- A testable theory, or statement of belief used in evaluation of a population parameter of interest. e.g. Mean or proportion.

① Steps in Hypothesis testing.

• Statement of 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 a 5% chance of wrong results.

## (2) Steps in Hypothesis testing.

Choosing an appropriate statistics  
 $t$  test,  $Z$  test for continuous data,

Chi square for proportional 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 assuming that there is truly no association b/w exposure and outcome under consideration.

Performing calculations and obtaining  $P$  value.

Drawing conclusions. rejecting null hypothesis if the  $P$  value is less than the set significance level.

## $\alpha$ and $\beta$ error.

	True $H_0$ Hypothesis	False $H_0$ Hypothesis
Accept $H_0$ Hypothesis	Correct Decision	wrong decision $\beta$ error
Reject $H_0$ Hypothesis	wrong Decision $\alpha$ Error.	Correct Decision.