1. a) What are declarative and null hypothesis? Explain giving examples.

Ans: Null Hypothesis
The null hypothesis is the proposition that implies no effect or no relationship between phenomena or populations. Any observed difference would be due to sampling error (random chance) or experimental error. The null hypothesis is popular because it can be tested and found to be false, which then implies there is a relationship between the observed data. It may be easier to think of it as a nullifiable hypothesis or one the researcher seeks to nullify.

The alternate hypothesis, $H_a$ or $H_1$, proposes that observations are influenced by a nonrandom factor. In an experiment, the alternate hypothesis suggests that the experimental or independent variable has an effect on the dependent variable.

There are two ways to state a null hypothesis. One is to state it as a declarative sentence, and the other is to present it as a mathematical statement.

For example, say a researcher suspects that exercise is correlated to weight loss, assuming a diet remains unchanged. The average length of time to achieve a certain weight loss is an average of 6 weeks when a person works out five times a week. The researcher wants to test whether weight loss takes longer if the number of workouts is reduced to three times a week.

DECLARATIVE HYPOTHESIS:
When the researcher makes a positive statement about the outcome of the study, the hypothesis takes the declarative form. For example, the hypothesis: “The academic achievement of extroverts is significantly higher than that of the introverts.” is stated in the declarative form. In such a statement of hypothesis, the researcher makes a prediction based on his theoretical formulations of what should happen if the explanations of the behavior he has given in his theory are correct.

b) Briefly discuss the characteristics of a good hypothesis.

Ans: Characteristics & Qualities of a Good Hypothesis are
- Power of Prediction
One of the valuable attributes of a good hypothesis is to predict for future. It not only clears the present problematic situation but also predict for the future that what would be happened in the coming time. So, hypothesis is a best guide of research activity due to power of prediction.

- Closest to observable things
A hypothesis must have close contact with observable things. It does not believe on air castles but it is based on observation. Those things and objects which we cannot observe, for that hypothesis cannot be formulated. The verification of a hypothesis is based on observable things.

- Simplicity
A hypothesis should be so dabble to every layman. P. V young says, “A hypothesis would be simple, if a researcher has more in sight towards the problem”. W-ocean stated that, “A hypothesis should be as sharp as razor’s blade”. So, a good hypothesis must be simple and have no complexity.

- Clarity
A hypothesis must be conceptually clear. It should be clear from ambiguous information’s. The terminology used in it must be clear and acceptable to everyone.

- Testability
A good hypothesis should be tested empirically. It should be stated and formulated after verification and deep observation. Thus testability is the primary feature of a good hypothesis.

- Relevant to Problem
If a hypothesis is relevant to a particular problem, it would be considered as good one. A hypothesis is guidance for the identification and solution of the problem, so it must be accordance to the problem.

- Specific
It should be formulated for a particular and specific problem. It should not include generalization. If generalization exists, then a hypothesis cannot reach to the correct conclusions.

- Relevant to available Techniques
Hypothesis must be relevant to the techniques which is available for testing. A researcher must know about the workable techniques before formulating a hypothesis.

- Fruitful for new Discoveries
It should be able to provide new suggestions and ways of knowledge. It must create new discoveries of knowledge J.S. Mill, one of the eminent researcher says that “Hypothesis is the best source of new knowledge it creates new ways of discoveries”.

- Consistency & Harmony
Internal harmony and consistency is a major characteristic of good hypothesis. It should be out of contradictions and conflicts. There must be a close relationship between variables which one is dependent on other.

c) What do you understand by descriptive and analytic studies? List the various descriptive and analytic studies you may carry out while undertaking epidemiological studies.

Ans: Descriptive studies generate hypotheses by answering the questions Who, What, Where, and When whereas analytic studies test these hypotheses by answering the questions Why and How.

Descriptive studies provide information on the frequency of occurrence of a particular condition and on patterns of occurrence according to such attributes as person, place, and time. Routinely collected statistics from such sources as mortality data, hospital discharge records, general health surveys, and disease surveillance programs are used for most descriptive studies. Analytic studies measure the association between exposure and outcome and also include a comparison group. The differences between these types of observational epidemiologic studies can be described below:

Descriptive studies