

**CMR Institute of Technology
Department of Management Studies**

Answer key

II Internal test – II semester MBA (2016-18 Batch)

Subject: Research Methods

Sub Code: 16MBA23

Date: 25.04.2017

Time: 9:00-10:30

Duration: 90 mins

1. (a) Difference between parametric and non- paramedic tests?

Parametric test	Non parametric Test
1. They utilize all information provided by the sample, hence these are more efficient.	These do not utilize all the information provided by the sample, Hence these tested are less effective than corresponding parametric test to get same efficiency these needs lay sample size.
2. (t-test and Z-test) parametric test assume that the underlying population to be normally distributed some tests also requires equal variance of both population.	Non parametric test have no assumptions regarding distribution of parent population.
3. These tests can be used even when these are slight departure from normality if the sample size is large.	When sample size is small non parametric tests are preferred. This is more so when the population distribution is badly skewed or not known.

Parametric test	Non parametric Test
1. These are not distribution free tests, they need the assumption of normality.	These are distribution free tests. They do not require any assumption regarding the shape of the population from where the sample is drawn.
2. can be applied for both a small and large samples	Can be applied for small samples.
3. Use metric data	Ordinal or interval scale data is used.

(b) Write short notes on: Focus group. ii. Depth interview iii. Delphi method

- a) **Focus group** is a group of small people who have common interest on a particular topic and are allowed to share their opinions, who is motivated by the interviewer. It is a type of personal interview method where the selected group of respondents or informants are asked to discuss on a specific topic or subject, which is moderated by an experienced moderator. Focus group creates synergy. It is a process of getting the information about the object by the interviewer.

Depth Interview: In this method, the interviewer intensively interviews the interviewee to get in-depth knowledge and greater insight into the topic taken for research.

It is a unstructured interview method, where the informants are independent to give their perspective. The group has the freedom to talk and share their perspective in depth.

Delphi Method: In this method, the groups are formed and the information is gathered by the person who acts as a facilitator to record the opinion.

Is a structured communication technique for a systematic interactive forecasting method, which relies on a panel of experts, the expert's answer the questionnaire in two or more rounds after each round a facilitator provides summary of each round and is carried on this way. The method helps in data collection from experts and experienced persons.

(c) Highlight the advantages and disadvantages of secondary data?

advantages	disadvantages
Economy	Relevance
Quickness	Accuracy
Quality	Existence of obsolete information
No measuring instruments	Non disclosure of research findings
Availability	rarely catering to need
Basis for comparison	Difficulty in source identification
Generates feasible alternative	Errors in recording & transferring information from one source to another source.

2. (a) List the qualitative methods of data collection

Qualitative research techniques can be categorised:

1. Based on Questioning
 - Focus group – Unstructured Interview of 6-8 people on the views on a common subject.
 - Depth interviews – Structured interview of single group on sensitive issues.
 - Projective techniques – Hidden characteristics to be identified.
2. Based on Reasoning
 - Ethnography-Study of Human Culture, value and beliefs.
 - Grounded theory – Theory of behavior
 - Participant observation – involvement of the Researcher in the phenomenon.

(b) When do we use Man-Whitney U-test? Explain the procedure for conducting this test?

Mann- Whitney U test is used to examine whether two samples have been drawn from population with same mean. This test is an alternate to a T-test, for testing the equality of means of two independent samples. This is a very powerful, non-parametric test which can be used both for qualitative and quantitative data.

Procedure:-

H0 : two sample come from identical population

H1: tow samples come from different population.

The tow samples are combined into one large sample and then we determine the rank of each observation in the pooled sample. If there is a tie give average rank. Determine the sum of the ranks of each sample. Let R1 and r2 represent the sum of the ranks. N1 and n2 are the sample sizes.

Define $U1 = r1 - n1(n1+1)/2$

$U2 = R2 - n2(n1+1)/2$

u- smaller (u1, u2)

compare this with the table value of u cal < U table value accept H0

if sample size is large (>10), then consider U_1 & U_2 to test and find
 $\text{mean} = \frac{n_1 n_2}{n}$
 $SD = \sqrt{\frac{n_1 n_2 (n_1 + n_2 + 1)}{12}}$
 Then the test static is : $z = \frac{U_2 - \text{mean}}{SD}$
 If $z_{\text{cal}} < z_{\text{table value}}$, accept H_0 .

(c) Explain different types of primary data collection methods?

Methods of Primary data collection:

Important methods of Primary data collection are:

- 1) **Observation**
- 2) **Interviewing**
- 3) **survey**
- 4) **Experimentation**
- 5) **Simulation**
- 6) **Projective technique**

3. (a) What is snow ball sampling give an example

Snow ball sampling

This is a technique of building up a list or a sample of a special population by using an initial set of its members as informants.

E.g. To study the problem faced by Indians abroad, through some source like Indian embassy we can ask each one to supply names of other Indians known to them and continue this procedure until he gets an exhaustive list, from which he can form a sample or make a census survey.

(b) What are projective techniques? Mention the types of Projective Techniques with example?

Projective techniques involve presentation of ambiguous stimulus to the respondents for interpretation.

In doing so, the respondents reveal their inner characteristic popular during 1950's.

Types of Projective Techniques

Visual Projective Technique: Rorschach Tests, Thematic Appreciation Test (TAT), Rosen weigh test of cartoon Test, Picture frustration Test and Holtzan inkblot Test.

Verbal Projective Technique: Word association test, Sentence completion test and Story completion test.

Expressive Projective Technique: Play, Drawing, Finger painting, Role playing.

(c) A certain stimulus administered to each of 12 patients resulted in the following changes in blood pressure.

5, 2, 8, -1, 3, 0, -2, 1, 5, 0, 4, 6.

Can it be concluded that the stimulus will in general be accompanied by an increase in blood pressure.

In this case, we are given the increments d , which the difference in BP, before and after administering the stimulus.

$H_0: \mu_1 = \mu_2$, i.e. there is no significant difference in the blood pressure readings of the patients before and after the drug.

$H_1: \mu_1 \neq \mu_2$, i.e. the drug result is an increase in BP.

test static is $t = \frac{\bar{d}}{s/\sqrt{n}}$

C V is at t_{n-1} , if table value at 5% loss and

d	d2
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5	25
2	4
8	64
-1	1
3	9
0	0
-2	4
1	1
5	25
0	0
4	16
6	36
31	185

$$D = \frac{\sum d}{n} = \frac{31}{12} = 2.58$$

$$S^2 = \frac{1}{n-1} [\sum d^2 - \frac{(\sum d)^2}{n}]$$

$$= \frac{1}{11} [185 - \frac{(31)^2}{12}]$$

$$= \frac{185 - 80.08}{11} = 9.5382$$

$$t = \frac{\bar{d} - \sqrt{s^2}}{n} = \frac{2.58 - \sqrt{9.5382}}{12}$$

$$= 2.894$$

$T_{cal} >$ critical value (2.201), therefore we reject H_0 and conclude that the drug is effective in increasing blood pressure.

4. (a) Sampling techniques or methods

Two types: **Probability sampling – Random Sampling**
Non-Probability Sampling – Random Sampling

Probability Sampling – Random Sampling

Means picking out units "at random" i.e., haphazard or hit and miss way.

1. Simple random sampling

This technique gives each element an equal and independent chance of being selected. An equal chance means an equal probability of selection.

The lottery method
 Table of random numbers
 Use of computers

2. Stratified random sampling

This is an improved type of random or probability sampling. In this method, the population is divided into homogeneous groups or strata, and stratum.

This helps: in increasing samples efficiency

Provides adequate data for analyzing various sub-options.

Applying different method to different strata.

Eg: university students can be divided based on basis of discipline and each discipline again on the basis of juniors & seniors.

3. Systematic random sampling

It consists of taking every 'kth' item in the population after a random start with an item from 1 to K.

E.g: if desired to select a sample of 20 students from a list of 300 students, divide 300 by 20 the quotient is 15, select a random number b/w 1 and 15 using lottery method or a table of random numbers. Let the selected number is 9. Then the students numbered are $9(+15)=24$, $24(+15)=39$, $39(+15)=54$ are selected sample.

4. Cluster sampling

Is random selection of sampling units consisting of population elements. Each such sampling unit is a cluster of population elements. Then from each selected sampling unit a sample of population element is drawn by either simple or stratified random selection.

Eg: select a sample of 1000 households out of 40,000 households in a city.

Population	Element	Cluster or sample unit
City	Household	Blocks
City	Individuals	Household
University	Students	Affiliated colleges
Rural areas	household	Villages
Industrial areas	Industrial unit	Industrial estates

5. Area sampling

An Important form of cluster sampling. In larger field surveys cluster consisting of specific geographical areas like district, taluks, villages or blocks in a city are randomly drawn. As geographical areas are selected as sampling units in such cases, their sampling is called area sampling.

E.g: when the area covered by a study is city, take a map of the city, lay a transparent sheet with grid line it divides the city into squares -100 areas, leave 30 squares because of parks, commercial and public buildings etc, number the squares, let average number of household is 80, if the required sample of household is 640, to determine the number of square to be selected by dividing this total by 80 i.e., 8 squares. Study all the households in each of the sample eight squares.

6. Multi stage sampling and sub sampling.

In this method, sampling is carried out in two or more stages. i.e., at each stage a sampling unit is a cluster of the sampling units of the subsequent stage.

Eg: from a population of 40,000 households in 800 streets we can select a sample of 400 individual households or a sample of 8 streets, from it 10

7. Random sampling with probability proportional to size.

If one primary cluster has twice as large a population as another. It is given twice the chance of being selected. The 'PPS' is a better method for securing a representative sample of population elements in multi-stage cluster sampling.

8. Double sampling and multi phase sampling

Refers to the subscription of the final sample from a preselected larger sample that provides information for improving the final selection. When this procedure is extended to more than two phases of selection, it is then called as multi-phase sampling.

For eg: in a consumer behaviour study relating to television, a common set of data may be collected from a sample of household and a set of additional data from a sub-sample of cases possess colour TV's.

9. Replicated sampling

Replicated or interpenetrating sampling involves selection of a certain number of sub-samples rather than one full sample from a population. All the sub samples should be drawn using the same sampling technique and each is a self contained and adequate sample of the population.

This can be used with any basic sampling technique: simple or stratified, single or multi-stage or single or multi-phase sampling.

E.g.: to study a population of 3000 university students, instead of studying a sample of 300 students needed to be study, two groups of 150 or 5 groups can be studied.

