Chhatrapati Shahu Ji Maharaj University, Kanpur

Answer Script Details
Barcode 5767157

Roll No. 24039000085
Total Mark 62.50/75.00

Exam MASTER OF ARTS_ODD EXAM-DEC-24
Subject A090703T - QUANTITATIVE RESEARCH METHODS

Question wise Mark Summary

Q.No	Mark	Q.No	Mark	Q.No	Mark	Q.No	Mark
1A	4.5/5	8C	6.5/7				
1B	4.5/5	8D	NA/7				
1C	4.5/5	9	NA/15				
1D	4/5						
1E	4.5/5						
1F	4/5						
1G	3.5/5						
1H	3.5/5						
1I	3.5/5						
2	NA/15						
3	NA/15						
4	13/15						
5	NA/15						
6	NA/15						
7	NA/15						
8A	6.5/7						
8B	NA/7						

Chhatrapati Shahu Ji Maharaj University
Kanpur, Uttar Pradesh

PART-II

Date of Exam : 03/01/25 Shift : 1st Room No. : 36
Paper Code : A0907703T Subject : QUANTITATIVE RESEARCH METHODS Year/Sem : I
Name of Candidate : AREEBA AFTAB
Roll No. : 2 4 0 3 9 0 0 0 0 8 5

MARKS OBTAINED										
Q.	1	2	3	4	5	6	7	8	9	10
(a)										
(b)										
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(i)										
(j)										
Total										
Total Marks in Figure									Max. Marks	
Total Marks in Words										

COE Facsimile
Signature of Invigilator
Signature of Candidate

A0907703T
Paper Code

Signature of Evaluator

Course : MA PSYCHOLOGY
Session : 24-25 Year/Semester : I
Subject Name : QUANTITATIVE R. METHODS
Medium : English ● Hindi ○

Paper Code
A 0 9 0 7 0 3 T

Exam Date
0 3 0 1 2 0 2 5

Name of Candidate
AREEBA AFTAB

Father's Name
AFTAB AHMAD

College Code
K N 0 4 -

Exam Centre Code
K N 0 4 -

Type of Exam
Regular ● Ex-Student ○
Private ○ Back Paper Exam ○

ANSWER BOOKLET NO.
5767157

A0907703T
Paper Code

Enrollment Number : C S J M A 2 4 0 0 0 0 1 2 9 8 6 1

Candidate's Roll Number
2 4 0 3 9 0 0 0 0 8 5

Paper Code
A 0 9 0 7 0 3 T

Signature of Candidate
Signature of Invigilator
C S Facsimile
COE Facsimile

नोट : १. परीक्षार्थी को निर्देशित किया जाता है कि आवरण पत्र के मुख भाग पर अंकित सभी निर्देशों को सावधानी पूर्वक पढ़ें।
२. ओएमआर में भरी जाने वाली प्रविष्टियाँ काली स्याही से मुख भाग में भरी जायें। ३. गोलों को काले या नीले ऑलपेन से भरा जायें।

INSTRUCTION TO THE CANDIDATE FOR FILLING PART-I

1. Read the instructions carefully given on the answer script and admit card.
2. Write Date of Exam, Shift, Paper Code & Name of Subject Correctly.
3. Write Name & Roll No. Correctly.
4. Write Semester & Branch Correctly.

INSTRUCTION TO THE CANDIDATE FOR FILLING PART-III

1. Use blue or black ball point pen for writing alphabets & numerals in ☐ boxes.
2. Carefully study the example before you start marking.
3. As shown in the example below, blacken the circles completely.

4. Make no Stray marks on this sheet.
5. **DO NOT WRITE OR MARK ON THE BAR CODE.**

IN ORDER TO AVOD UFM (UNFAIR MEANS) :

1. The Roll No. and Answer Book no. found elsewhere or any other symbol found in the answer book will be treated as unfair means.
2. Any tempering of Bar Code and Booklet no shall be treated as Unfair Means.
3. Do Not bring the materials like slip of paper/mobile/digital diaries/ study material/ revision notes in examination hall. Possession of the mobiles/ digital diaries/electronic/digital/ watch and any other electronic gadget except memory less scientific calculator shall be considered as UFM case.
4. Do not keep or paste currency note in answer script it shall be consider as UFM.

अनुचित साधन से बचने हेतु :

1. उत्तर पुस्तिका के निर्देशित स्थान को छोड़कर अनुक्रमांक एवं उत्तरपुस्तिका का क्रमांक कहीं और न लिखे तथा कोई भी चिन्ह न बनायें अन्यथा यह अनुचित साधन प्रयोग की परिधि में आता है।
2. उत्तर पुस्तिका के बारकोड अथवा उत्तर पुस्तिका संख्या पर छेड़ छाड़ करने पर अनुचित साधन प्रयोग माना जायेगा।
3. परीक्षा कक्ष में निम्न वस्तुएं साथ न लायें, जैसे लिखे हुए कागज के टुकड़े, मोबाईल, डिजिटल डायरी, डिजिटल वॉच, घड़ी, पुस्तक यह सभी वस्तुएं जो अनुचित साधन के अन्तर्गत आती है। केवल संबंधित प्रश्नपत्र में ही बेसिकी लेस साइंटिफिक कैलकुलेटर ले जाने की अनुमन्यता होगी।
4. उत्तर पुस्तिकाओं में कलमें न रखें न ही उत्तर पुस्तिका में चिपकायें। ऐसा करना अनुचित साधन प्रयोग की परिधि में आता है।

परीक्षार्थियों को विशेष निर्देश:

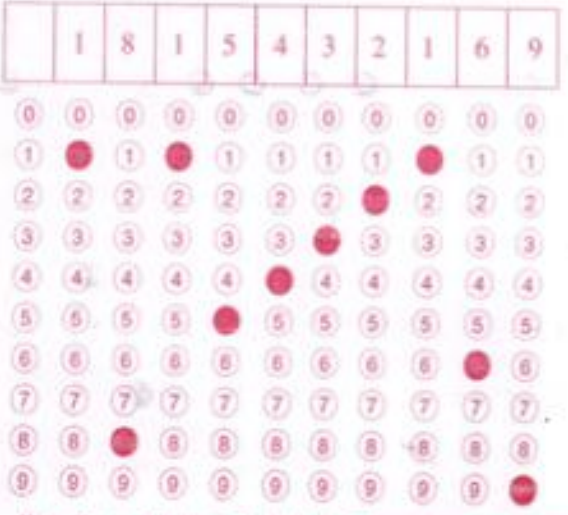
1. प्रवेश पत्र एवं उत्तर पुस्तिका पर दिये गये निर्देशों को ध्यान से पढ़ें।
2. कवर पृष्ठ के दूसरी तरफ कुछ न लिखें।
3. उत्तर पुस्तिका के पृष्ठों पर दोनों तरफ लिखें।
4. प्रश्न पत्र पर अपने अनुक्रमांक के अतिरिक्त कुछ न लिखें।
5. प्रश्न पत्र कोड एवं प्रश्न पत्र ID सावधानी पूर्वक लिखें।
6. अपनी स्थिति स्पष्ट लिखें।
7. उत्तर पुस्तिका के पृष्ठों की संख्या देखें। अगर उत्तर पुस्तिका में पृष्ठ (1-24) से कम है या फटे हुए है, तो परीक्षा शुरू होने के पूर्व दूसरी उत्तर पुस्तिका ले लें।
8. प्रश्नपत्र को देख, यदि प्रश्नपत्र के विषय कोड, विषय का नाम तथा प्रश्न में कोई त्रुटि है तो उसके परीक्षा होने के 30 मिनट के अन्दर कक्ष निरीक्षक को तत्काल सूचित करें, उसके बाद विश्वविद्यालय द्वारा कोई सुधार नहीं की जायेगी।
9. प्रश्नों के उत्तर लिखने के लिये पेंसिल का प्रयोग न करें।
10. बी कोरी या अतिरिक्त शीट नहीं दिया जायेगा।

INSTRUCTION TO THE CANDIDATE

1. Read the instructions carefully given on the Question Paper, Admit Card & Answer Script.
2. Do not write anything on back side of the cover page.
3. Write on both sides of pages of answer book.
4. Do not write anything on question paper except Roll Number.
5. Write Paper Code & Question Paper Id carefully.
6. CHECK the number of pages (1-24) or any other kind of damage in your answer script, if found than change the answer script immediately before the commencement of examination.
7. CHECK the Question Paper for any kind of discrepancy e.g. Subject Code, Su Name, and Question of the Question Paper during first THIRTY MINUTES of t commencement of the exam, so that it can be corrected in TIME. After that no corrections shall be entertained by the university.
8. Do not use pencil for answering the question.
9. Write status correctly e.g. those appearing in carry over papers should fill in stat as Carry Over. Those appearing as Ex- Students should fill in status as ex.
10. No supplementary answer book & graph paper will be provided.

INSTRUCTION TO THE CANDIDATE FOR FILLING PART-IV

1. Use blue or black ball point pen for writing alphabets & numerals in ☐ Boxes.
2. Use blue or black ball point pen for filling the circles.



Note- If your Roll No. is of 10 digits, Please leave first three columns .

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Section-A

A) The importance of Psychological Statistics is as follows:

i) Objective and Empirical: Statistics in psychology are based on observable phenomena and empirical data which helps researchers make well-informed decisions based on facts rather than relying on assumptions or anecdotal observations.

ii) Effective Communication: Statistical methods like tables, graphs, charts, etc. help organize and present complex information in an understandable and meaningful manner. This helps to relay the information and make it comprehendable to both academic and non-academic audiences, leading to effective communication.

iii) Contribution to Research: Statistical methods and tools are used to conduct scientific researchers to explore phenomenons. This includes data collection via experiments, surveys, interviews, etc; data analysis (using t-test, ANOVA or qualitative methods depending on nature of study) and lastly, interpreting the data to draw meaningful conclusions.

iv) Helps in Hypotheses testing: Researches begin by formulating a hypothesis — a tentative statement or prediction about the relationship between

the variables. The hypothesis is either rejected or accepted based on the findings leading to enhanced understanding of different scientific questions or research questions.

B) Difference between Inferential and Descriptive statistics is as follows —

i) Aim/Purpose

Descriptive statistics aim to summarize, and organize, and describe the main features of the dataset. They present information in a meaningful manner.

Inferential statistics are concerned with making inferences or drawing conclusions/ making predictions about a larger population based on the drawn sample.

ii) Methods Used

Descriptive statistics use Measures of Central Tendency (Mean, Median, Mode) and Measures of Variability (Range, Variance, Standard Deviation) to organize and describe data.

Inferential Statistics use methods like t-test, ANOVA which are tests of significance used to compare means of different groups and draw conclusions about the groups based on selected sample.

iii) Variables

Descriptive Statistics involve univariate or bivariate analysis, focusing on one or two variables at a time.

Inferential statistics involve multivariate analysis. They can focus on two or more variables simultaneously.

iv) Scope

Descriptive statistics only focus on the specific dataset at hand (sample or population) without making any generalizations beyond it.

Inferential statistics go beyond the sample data to make predictions about the larger population based on the representative nature of the sample and findings drawn from it.

c) Probability sampling methods ensure that all individuals of a population have a known and equal chance at selection for participation. This minimizes selection bias and allows to make statistical inferences about the population. The methods are as follows :

i) Simple Random Sampling : All members of a population have a known and equal chance at selection. Selection is done randomly using a random number generator or via lottery methods. This method reduces bias and helps in generalizing results.

ii) Systematic Sampling : This method involves selecting participants at regular intervals from a randomly ordered list. For eg : selecting every 5th individual from a list after randomly choosing a starting point. This method also reduces selection bias and ensures a spread in selection.

iii) Stratified Sampling : The population is divided into subgroups (strata) based on specific characteristics (eg : gender, age, income) and random selection is done from each stratum. This method ensures representation of all key factors of a population in a sample, leading to generalizable results.

iv) Cluster Sampling : This method involves selecting entire groups or clusters randomly from a population. For eg: selecting entire schools randomly from a particular state to study the teaching methods used in that state. While this method is convenient and cost-effective, it can lead to sampling bias if selected clusters are not representative of the entire population.

D) Type 1 and Type 2 errors —

i) Type 1 error in hypothesis testing is also called a False Positive. In this error, researchers reject the null hypothesis even when it is true. A null hypothesis states that there is no effect or that these is no relationship between the variables. In this error, the researcher thinks that there is an observed effect or that a relationship exists between the variables when it does not.

ii) On the other hand, Type 2 error in hypothesis testing is also called a False negative. In Type 2 error, researchers accept the null hypothesis even though it is false. This means that the alternate hypothesis which states that a relationship exists between the variables is rejected even when it is true. Researchers believe that there is no difference between the variables or no observed effect, when, infact, it exists.

E) When variables are classified based on the nature of the data, they are categorized into continuous and discrete variables.

i) Continuous Variables are those variables which can take upon any value within a specified range. For example, height, weight, test scores etc. Such type of variables are often used in Parametric tests like t-test, ANOVA, Pearson's Correlation and Regression Analysis as they can take specific ranges (for eg: in a range of -1 to +1, the value is 0.3544) which help in finding exact answers, leading to enhanced understanding.

Continuous variables usually include interval and ratio data.

ii) Discrete variables cannot take upon any value within a specified range. They can usually take the values of integers only. For eg: IQ scores. Such types of variables can be handled by Non-Parametric tests like median and rank order.

F) Point Bi-serial correlation is a type of Measure of Association. Measures of association are advanced statistical techniques that quantify the strength and direction of the relationship between variables.

ii) Point Bi-Serial correlation measures the association between a continuous variable (that can take any value within a specified range) and a dichotomous variable. Such dichotomous variables must be binary in nature (Yes/No; Male/Female, etc.)

iii) For example: Studying the relationship between test scores (continuous variable) and attending/not attending (dichotomous) study sessions.

iv) This method, like all other ~~method~~ measures of association does not imply causation or cause-and-effect relationship. It shows correlation between variables, meaning that variables are related in effects to one another but no variable directly impacts the other variable.

Q) The Experimental Research Design is a type of framework that helps in collecting, analyzing, and interpreting data to make conclusions about the population from the sample. Its characteristics are as follows:

i) Hypothesis formulation: Any experiment aims to study a theory, a phenomena, etc. based on a hypothesis — a tentative statement or prediction about the nature of the phenomena or relationship between variables. By the end of the experiment, the findings lead to either acceptance or rejection of the null hypothesis.

ii) Data Collection: Data is collected via structured setups. Experiments are usually conducted in a controlled setting, such as a laboratory where the researcher can control and manipulate the variables accordingly.

Data is also collected via observational methods like naturalistic observation or systematic observation in experiments where behaviour is observed in a natural setting (naturalistic) or controlled setting like a lab and is recorded to analyze later.

iii) Control Groups: Experiments usually have control groups to give the placebo effect to so that it can be easier to understand the impact

of the Independent Variable on the study group by comparing the groups with each other. For eg: Testing the effectiveness of a drug by administering the drug to one group and a sugar solution to another group to isolate the impact of the drug and study its effects.

iv) This design is subject to many biases as well, such as researcher bias, sampling bias, participant bias and so on.

v) Participants must be randomly selected to avoid selection bias and ensure generalizability of results. Participants must also be representative of the characteristics being studied.

vi) Ethical guidelines like debriefing, informed consent, confidentiality, Right to Withdraw, Right to No Harm to participants, etc must be diligently followed to maintain integrity.

H) i) T-test is a statistical method which measures the mean of two groups to check if there is any significant difference between the group means.

On the other hand, ANOVA or Analysis of Variance measures the mean of more than two (three) groups to check for statistical differences.

T-test is of 3 types -

i) One-sample t-test
ii) Independent samples t-test
iii) Paired Samples t-test

ANOVA is of 3 types -

i) One-Way ANOVA
ii) Two-Way ANOVA
iii) Three-Way ANOVA

T-test works with [illegible] while ANOVA works [illegible] sample size.
T-test is used when no Std. Deviation is known, vice versa in ANOVA. (Std Dev. is known).

I) Correlation is used to find associations between two or more variables. It does not imply causation. For eg: stress levels and sleep disturbances have a positive correlation among college students. Correlation specifies the strength and direction of the relationship between the variables. It is of many types, but based on strength and direction, there is:

i) Positive Correlation: As one variable increases, other also increases and vice versa.
ii) Negative Correlation: As one variable increases other decreases
iii) Zero Correlation: There is no relationship between variables

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On the other hand, regression implies cause and effect relationship. It states that one variable directly impacts another. For eg: Increased physical activity reduces symptoms of depression in young adults. There are two types of Regression —

1) Stepwise Regression
2) Linear Regression

Section B

4) Sampling is a statistical method wherein a specific number of individuals are selected from a population using various sampling techniques. These individuals must have all the representative characteristics of the population that are to be studied in the research. Sampling helps in making generalizations about a larger population based on the sample drawn from it.

There are various sampling techniques in psychology. However, the broad categories are: Probability and Non-Probability Sampling methods.

Probability Sampling

This sampling method ensures that all individuals of a population get a known and equal chance at selection. This method reduces selection

bias, helps in making generalizations, and is more structured and systematic.

Types of Probability Sampling methods —

i) Simple Random Sampling: Every individual in the population gets a known and equal chance of selection. Participants are selected using random number generators and lottery methods. This helps reduce selection bias and results are generalisable. It also helps control extraneous/confounding effects are results are perceived to be true rather than occuring due to chance.

ii) Systematic Sampling: Participants are selected at regular intervals from a randomly ordered list. For eg: selecting every 5th person from a list after choosing a random starting point. This method also reduces selection bias and ensures spread in selection.

iii) Stratified Sampling: Population is divided into subgroups (strata) based on specific characteristics (eg: age, gender, socioeconomic status, etc.). Then participants are randomly selected from each stratum. This method ensures representativeness in the sample selected.

iv) Cluster Sampling: Entire clusters or groups are selected randomly from the population. This technique is applied when the population is too large demographically to select individual participants for eg: selecting entire schools or organizations for analysis in the study. This method is cost-effective and convenient but if cluster is not properly representative of the entire population being studied, results may be invalid.

II Non Probability Sampling methods do not give each member of the population an equal chance at selection. They are cheaper and easier to apply than probability methods, however, they also introduce more types of selection, researcher and participant biases.

Types of Non Probability Sampling

i) Convenience Sampling: This method includes selecting participants based on their availability, accessibility and willingness to participant participate. For eg: a researcher recruits participants from the class he teaches for a study on college students. This method can introduce researcher bias and the sample may not be representative of the entire population under study.

ii) Snowball Sampling: Existing participants recruit future participants from among their acquaintance This method is useful for accessing hard-to-reach populations (for eg: people with a rare health condition) but because of relying on participants for data, it can lead to biases.

iii) Purposive / Judgemental Sampling: Researcher recruits participants he/she believes fits the criteria well for the research purpose. Mainly used in qualitative researches where specific characteristics are required in the sample.

iv) Voluntary Response Sampling: Participants self-select to participate in the study, usually in response to advertisements. For eg: individuals self-select to give responses on online surveys. Though this method helps to find motivated participants, it can introduce self-selection bias.

v) Quota Sampling: A method where samples are chosen by the researcher until specific quotas are not fulfilled. For eg: a specific number of males & females in a study. This method ensures representation of key demographic factors but can introduce selection or researcher bias.

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Section C

Q8)

a) The assumptions of Multivariate Analysis of Variance (MANOVA) are as follows:

i) Multivariate Normality: The dependent variables must be equally distributed across all groups. This can be tested using techniques like Shapiro-Wilk Hypothesis.

ii) Homogeneity of Variance-Covariance Matrices: The variance-covariance matrices of dependent variables must be equal across all groups.

iii) Independent Observations - The data collected from one participant should not influence the data collected from another participant. Observations must be independent of each other.

iv) Absence of Multicollinearity: Dependent Variables must not be highly correlated to each other as this can distort results.

v) Large Sample Size: Larger sample sizes help in producing reliable results when using MANOVA.

c) i) Duncan's Multiple Range Test (DMRT) is a post-hoc analysis technique that compares specific groups' means after a significant result is found in ANOVA.

ii) Procedure: First conduct ANOVA to compare means of different groups.

iii) Upon significant result, apply DMRT and compare means of specific groups to find which means are significantly different.

iv) Arrange means in ascending order, then compare them pairwise in a step-by-step manner.

v) The means that exceed critical range are having significant differences.

vi) Critical range is calculated by statistical difference (α), ~~number~~ number of groups, and sample size.

Paper Code

17

X

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24

Do Not Write anything in this Portion