

RS-80  
O/C  
MMM I

JAINALAL BAJAJ INSTITUTE OF MANAGEMENT STUDIES

UNIVERSITY OF MUMBAI

MFM/MHRDM/MMM/MIM SEMESTER II

MAX. MARKS 100

DURATION 3 HRS

- Note :
1. Attempt any five questions selecting not more than three from any section.
  2. All questions carry equal marks.

### SECTION I

- Q 1. a. What is research? Explain its characteristics and scope.  
b. Describe the methods of primary data collection with its advantages and disadvantages.

Q 2. What is a research process? Elaborate it step by step with examples.

Q 3. a. "The problem formulation stage is perhaps more critical in the research process than the problem solution stage." Discuss.

b. What is rating and ranking scale? Discuss, with examples the use of any four rating scales.

Q 4. You have been hired by a group of hotels and Restaurants who wish to develop a tourist spot. The proposed tourist spot is surrounded by hills from all sides. The hotel is proposed to have beautiful gardens, swimming pool and have all facilities required for any world class resort.

Prepare in details, a proposal to be submitted to a financial company for raising funds for the above project.

Q5. Explain the following:

- a. Descriptive Research.
- b. Experimental Research.
- c. Internal and External validity.
- d. Extraneous Variable.

### SECTION II

Q6. a. A machine produces 25 defective items in a sample of 500. After the machine was overhauled 4 items were found to be defective in a batch of 125. From this data, can you conclude that the machine improved after overhauling?

b. The following table gives the demand along with its supply of a computer part:

Demand	20	25	30	35	40	45	50	55
Supply	12	20	28	32	40	40	46	52

Find a linear relation between demand and supply and estimate the supply for a demand of 27 parts.

Q7. a. The demand for two well known branded shirts for <sup>10</sup>8 months in the only shop in a city is given in the table below:

Brand A:	65	62	75	70	72	80	83	82	88	83
Brand B:	60	64	66	75	79	82	80	80	74	70

Test whether both the brands of shirts have same demand.

b. Find the product moment correlation coefficient between the rent of an apartment and its size in square feet in a certain locality:

Rent in '000 Rs.:	12	18	22	25	38	32	35	38
Size in sq. ft.:	500	550	600	650	700	750	800	850

Q8. a. In a study of certain exercise in weight reduction, a group of 10 persons engaged in this exercise for a month showed the following results:

Weight before	: 68	87	76	70	69	90	87	85	79	69
Weight after	: 60	80	78	65	60	86	80	82	70	69

Test at 5% level, whether the exercise results in reduction of weight.

b. Average commission charged by full-service brokerage firm on a sale of common stock is Rs. 144 with a standard deviation of Rs. 52. Free-lancer has taken a sample of 121 traders by his clients and determined that they paid an average commission of Rs. 151. At 0.05 significant level, can it be concluded that his client's commission is higher than the industry average?

Q9. a. HRD manager is interested in assessing whether there is association between the commuting time of workers and the level of stress-related problems observed on the job. The table below gives data on the frequencies of a random sample.

Commuting time (minutes)	Stress level		
	High	Moderate	Low
0 to 30	5	10	10
30 to 60	14	13	17
60 to 90	22	15	11
Over 90	18	9	6

Use an appropriate statistical test at a significance level of 5 percent to assess whether there is association between the two factors.

b. The marks scored in the subjects of Business Mathematics and Quantitative Techniques by 8 students are as under. Calculate Spearman's coefficient of correlation between the two.

Marks in B. Mathematics	: 55	64	72	82	72	60	55	72
Marks in Quantitative Techniques:	48	69	54	87	69	72	48	52

Q10. A study was conducted to compare the effects of three different drugs on the alleviation of anxious depression in the no psychotic patient. Twelve no psychotic patients, all suffering from moderate to severe depression and anxiety, were assigned at random to the three treatment groups. A combined anxiety and depression score as determined by MMPI and Taylor Manifest Anxiety Scale was recorded for each participant at the end of one week of therapy.

Drug A :	25	15	20	14
Drug B :	20	16	18	25
Drug C :	25	15	20	20

Do the data suggest at 5% level, that there is a difference in anxiety/depression scores for the three drugs?

University of Ni's  
JAMNALAL BAJAJ INSTITUTE MANAGEMENT STUDIES

Research Methodology

MMM/M

Time : 3 Hrs.

Marks : 100

Note : Q.1 is compulsory and write any four questions from Q. 2 to Q. 7, each question carries 20 marks.

Q. 1 V8 is a 100 percent vegetable juice drink produced and marketed by the Campbell Soup Company. The Juice drink. Made from concentrated added ingredients, provides a full serving of vegetables and is a natural source of beta-carotene. V8's ingredients include tomato juice from concentrate; reconstituted vegetable juice, made from water and concentrated juice of carrots, celery, beets, parsley, lettuce, water, and spinach; salt vitamin C (ascorbic acid); flavoring; and citric acid. The drink contains no fat or cholesterol, and it is a good source of vitamins A and C.

V8 has for many years had a large share of the tomato and vegetable juice market. However, sales had begun to slip, so the company decided it had to conduct consumer research that would enable it to develop a new advertising campaign.

Please go through the case and answer the following questions

1. What research objectives should marketers at V8 establish?
2. What research methods would be most appropriate to accomplish these objectives?
3. What will be the Sample Design?
4. Develop few questionnaires to collect the primary data

OR

Q. 1 What is scientific method of business research? What are its bases? Explain in detail the scopes of business research in the area of Marketing or Information Technology with examples?

Q. 2 A. What difference does it make in research whether we measure in terms of a Nominal, Ordinal, Interval and Ratio scales explain with examples?

B What are the scientific steps used in the formulation of research problem? Formulate the research problem in the broad area of "Foreign Direct Investment (FDI) in Retail".

Q. 3 Describe various steps involved in research process with examples.

Q. 4 Explain the use of sampling in social science research? What is quota sampling? Is it related to stratified random sampling? Discuss the merits and demerits of stratified and quota sampling with business example?

Q. 5 Explain the Following.

1. State the meaning and need for exploratory & correlation Study.

2. Definition and importance of hypothesis.

3. Examine the application of survey method in different fields.

4. Types and usefulness of research variables.

Q. 6 Describe the application of information technology in research in terms of data collection, statistically analysis of data, interpretation & data presentation, and also in preparing research proposal.

Q. 7 A. Describe the basic research design issues in terms of its

1 Number of Contacts

2 Reference Periods

3 Nature of Investigation

B As a Management student you are suppose to submit your year long research report what should be the content of your research report in the chronological order?

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JAMNALAL BAJAJ INSTITUTE OF MANAGEMENT STUDIES  
UNIVERSITY OF MUMBAI  
RESEARCH METHODOLOGY

MFM/MM/M/MHRDM/MIM I  
M. MARKS 60

29<sup>th</sup> April 2011  
SECTION I

SEMSTER II  
DURATION 3 HRS

Q. 1 Identify type of research in following situations and justify your classification

- a) To assess the impact of soft music in office on the productivity of employees, the human resource manager played soft music on alternate days for a period of 1 month. Other aspects are all kept to be the same; he observed the said relationship to prove to the higher management his point of soft music enhances the productivity.
- b) On account of some casualty in one of the branches of Zodiac Co. a team of executives visited the site, collected data and presented it to the top management of Zodiac Co.
- c) A researcher is interested in knowing the management of family and business by women entrepreneurs and business women; she undertakes a research study to find out the processes in home and business management.
- d) A new procedure is going to be adopted in Malva Inc. The management appoints a team of managers to steer the change in the company smoothly.

Q.2 a Just Mention various data collection methods. Explain with example the Survey Method. When is it appropriate to use? What are the advantages and disadvantages of using computer aided survey method?

b What are the salient features of research design?

Q 3 a Define Sampling procedure. Why is sampling required? What are the types of sampling procedure? If you have to collect data from all over Mumbai how will you get the sample? Why?

b How can we use data collection method Observation in management research?

Q. 4 Assume that Rasna has introduced a new flavor of tender coconut in March in market early this year. After almost two months Rasna wants to know the opinion of the consumers for the new flavor. You are consultant to Rasna, present research design. OR

A pharmaceutical company wants to conduct a survey of organizational climate. The climate will include all the dimensions of organization that matters for better performance. Create a theoretical framework that can be used as a basis to design a research study.

Q. 5 a What are Rating and ranking scales? Use ANY FIVE to illustrate their use.

b "Report writing is the pinnacle of the research study." Elaborate on the points for creating a good research report.

SECTION II

$\chi^2$  at 5% 1 d.f = 3.84 4 d.f = 9.49 Z at 5% two tailed  $\pm$  1.96 one tailed  $\pm$  1.65

Q.4 (a) Write a note on Inventory control.

(b) A purchase manager has decided to place orders for a minimum quality of 500 nos of a particular item in order to get a discount of 10% Last year 8 order each of size 200 nos were placed Given Annual demand = 1600 units, cost of placing an order = Rs. 500, unit cost of item = Rs. 400, Inventory carrying cost = 40%, Is the Purchase Manager justified in his decision. What is the effect of his decision on the company.

Q.5(a) Explain the features of process costing?

(b) 20,000 units were introduced in process at a cost of Rs. 30,000/-. After processing 17,500 units were transferred to process B which produced final output of 17000 units. Other details are as follows:-

	Process 'A'	Process 'B'
Material Cost	Rs. 30000	3000
Labor Cost	Rs. 10000	12000
Overheads	Rs. 7000	9850
Normal loss %	10 %	4
Sale value of scrap units	Rs. 1	2

Prepare Process Accounts.

Q.6 (a) Define Budget and Budgetary Control?

(b) X Ltd produces a standard product, the estimated cost of which is given below:-

Raw materials	Rs. 10 per unit.
Direct wages	Rs. 8 per unit.
Direct Expenses	Rs. 2 per unit.
Variable overheads	Rs. 3 per unit.

Semi Variable overheads at 100% activity level (10000 units) are expected to be Rs. 40000, and these overheads vary in steps of Rs. 2000 for each change of output of 1000 units. Fixed overheads are estimated at Rs. 50000. Selling price per unit is expected to be Rs. 40. Prepare a feasible budget at 50%, 70% and 90% levels of activity.

Q.7(a) Define Marginal cost and marginal costing. What are the features, advantages and limitations of marginal costing?

(b) State which of the alternative sales mixes you would recommend to the management and why.

Selling Price-	X Rs. 25 per unit, Y Rs. 20 per unit.
Direct Material-	X Rs. 8 per unit, Y Rs. 6 per unit.
Direct wages-	X Rs. 6 per unit, Y Rs. 4 per unit.
Fixed overheads	Rs. 750/-
Variable overheads	150% of direct wages.

Alternative Sales Mixes.

1. 250 units of X and 250 units of Y.
2. Nil units of X and 400 units of Y.
3. 400 units of X and 100 units of Y.

Q. 8 Write Short notes on (Any 3)

(i) Limitations of Financial Accounting.

(ii) Breakeven Analysis.

(iii) Allocation, Apportionment and Absorption of overheads.

(iv) Functional classification of costs.

University of Mumbai  
Jamnalal Bajaj Institute of Management Studies  
First Year Second Semester 2010-2011  
MHRDM/MIM/MFM(BATCH-II)  
Sub : Research Methodology

Thursday 29<sup>th</sup> April, 2010

(3 Hours)

(Total Marks 100)

- NB: 1 Attempt any Five questions by selecting at least two questions from each section  
2. All questions carry equal marks.  
3. Explain with examples wherever possible

SECTION I

1. What is research problem? Explain with suitable examples, issues which should receive the attention of researcher in formulation the research problem
2. Explain the following terms in context of research design
  - a) ~~Extra means~~ variables ~~E~~xtraneous
  - b) Confounded Relationship
  - c) Research Hypothesis
  - d) Experimental and control group
  - e) Treatments
3. a) Under what circumstances stratified random sampling design is considered appropriate? How would you select such sample? Explain by means of an example.  
b) Explain the difference between collecting data through questionnaires and schedules.
4. What is the meaning of measurement in research? What difference does it make whether we measure in terms of a nominal scale, ordinal scale, interval scale or ratio scale? Explain giving examples.
5. Distinguish between the following :
  - a) Simple hypothesis and composite hypotheses
  - b) Null hypothesis and alternative hypothesis
  - c) One tailed test and two tailed test
  - d) Type I error and Type II error
  - e) Acceptance region and critical region

SECTION II

6. a) A company appointed two salesmen A and B. After one year of their appointment, a survey on their performance was analysed as follows:

	Salesman A	Salesman B
Number of Sales	10	12
Average weekly sales (Rs. Lakhs)	30	28
Standard Deviation (Rs Lakhs)	10	6

Is there any significant difference between the average sales of the two salesman?

Given  $t_{.025}(20)=2.086$



b) in a department store, 380 customers of a random sample of 800 customers were found to be using visa credit card. Discuss whether this information supports the view that the majority of customers of the store are using cards other than visa.

7. a) A machine produces 20 defective items in a sample of 500. After the machine was overhauled, it produced 5 defective items in a batch of 150. Has the machine improved after overhauling?

b) 10 new recruits were give rigorous training by the army. Their weight (in kg) were recorded before and after the training as shown :

Weight before : 127 195 162 170 143 205 168 175 197 136

Weight after : 135 200 160 182 147 200 172 186 194 141

Using 5% level of significance, can we conclude that the training has increased the average weight of new recruits? ( $t_{.05}(9) = 1.83$ )

8. In the management institute, students are graded as A,B and C in their final examination. Out of total 120 students, 45 specialized in Finance, 50 in Marketing and the remaining in Operations. Their grades are given as follows:

Specification	Grades		
	A	B	C
Finance	20	15	10
Marketing	30	12	8
Operations	10	13	2

Using 5% level of significance, determine whether the grading is independent of specialization? ( $\chi^2_{.05}(4) = 9.488$ )

9. The theory predicts that the proportion of beans in the four groups A,B,C and D should be 9:3:3:1. In an experiment among 1600 beans, the member in the four groups were 882, 313, 287 and 118. Does the experimental result support the theory? Use  $\chi^2$  test at 1% level of significance ( Give  $\chi^2_{.01}(3) = 11.341$ )

10. The following table given monthly sales (in lakh rupees) of a certain firm in three states by its 4 salesmen:

States	Sales man				Total
	A	B	C	D	
X	5	4	4	7	20
Y	7	8	5	4	24
Z	9	6	6	7	28
Total	21	18	15	18	72

Find whether the difference between sales affected by 4 salesmen and the difference between sales affected in 3 states are significant.

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RESEARCH METHODOLOGY

Max marks 60

Duration 3 hrs

- Note :
- 1) Solve any five Questions by selecting at least Two questions from each section.
  - 2) Each question carries equal marks
  - 3) Use of Statistical tables and Electronic calculator is permitted

**Section I**

- Q.1 a) What is research design?  
b) Explain what do you understand by exploratory research, descriptive research?
- Q. 2 What do you mean by sampling? Explain and distinguish systematic sample and cluster sampling methods. If probability sampling is not possible what other sampling methods are used?
- Q. 3. What are the issues that one must consider before starting the research process? When is it appropriate to commence the research?
- Q. 4. Define:
- a. Nominal scale
  - b. Ordinal scale
  - c. Interval Scale
  - d. Ratio scale
  - e. Scalogram or Guttman Scale
- Q 5. a) What are the types of variables? Explain with examples.  
b) What is hypothesis? Explain in detail different types of Hypothesis and testing of Hypothesis.

**Section II**

Q 6. The number of parts of a particular spare part in a factory was found to vary from day to day. In a sample study the following information was obtained.

Day	Mon.	Tue.	Wed.	Thur.	Fri.	Sat.	Total
No. of parts demanded	1124	1125	1110	1120	1126	1115	6720

Test the hypothesis that the number of parts demanded does not depend on the day of the week. (The table value of  $\chi^2$  for 5 d.f. at 5% level of significance is 11.07)

Q 7 a) In a sample of 500 people in Kerala, 280 are tea drinkers and the rest are coffee drinkers. Can we assume that both coffee and tea are equally popular in this State at 1% level of significance ?

b) A sample of 400 male students is found to have mean height of 171.38 cms. Can it be reasonably regarded as a sample from a large population with mean height 171.17 cms and s.d. 3.30 cms

Q 8. Intelligence test given to two groups of boys and girls gave the following results.

Girls : Mean Marks = 78, S.D. = 12, N = 80

Boys : Mean Marks = 75, S.D. = 15, N = 120

Is the difference in the main scores significant ?

Q 9. A certain drug is claimed to be effective in curing colds. In an experiment on 164 people with cold, half of them were given the drug and half of them given sugar pills. The patients' reactions to the treatment are recorded in the following table.

	Helped	Harmed	No. effect	Total
Drug	52	10	20	82
Sugar Pills	44	12	26	82
Total	96	22	46	164

On the basis of this data can it be concluded that there is a significant difference in the effect of the drug and sugar pills ?

Q 10. A farmer applies three types of fertilizers on 4 separate plots. The figures on yield per acre are tabulated below :

Fertilizers	Yield				Total
	A	B	C	D	
Nitrogen	12	8	16	12	48
Potash	14	12	12	18	48
Phosphates	16	10	20	18	64
Total	42	30	48	48	168

Find out if the plots are materially different in fertility, as also, if the three fertilizers make any material difference in yields.

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**JAMNALAL BAJAJ INSTITUTE OF MANAGEMENT STUDIES**  
**UNIVERSITY OF MUMBAI**  
**SEMESTE END EXAMINATION**  
**MMM,MIM,MFM,MHRDM I** **SEMESTER II**  
**RESEARCH METHODOLOGY**  
**M. MARKS 60** **DURATION 3 HRS**

3<sup>RD</sup> MAY 2008

**Note:** Attempt ANY FIVE questions NOT MORE THAN THREE from any one section.  
**Neatness and cleanliness is expected. Messiness may be penalized.**

**SECTION A**

**Q 1.** Identify types of research in the following research abstracts. Suggest the broad outline of the research activity depending on the type of study to be conducted.

**1. Abstract**

We use a sample of 4,960 observations from 752 publicly quoted commercial banks operating in 87 countries between 1999 and 2006 and estimate cost efficiency and alternative profit efficiency using a global best-practice frontier while controlling for cross-country differences in regulations, macroeconomic conditions, concentration, activity in the banking sector, and country's overall level of development. In each case, we estimate a traditional function that considers loans and other earnings assets as the only outputs, and two additional functions that account for non-traditional activities, by considering either OBS items or non-interest income as an additional output. The results indicate that on average cost efficiency increases whether we use OBS or non-interest income. However, with respect to profit efficiency the results are mixed. The inclusion of OBS does not have a statistically significant impact on profit efficiency, whereas non-interest income results in higher and statistically significant different profit efficiency scores compared to the ones of the traditional model. Additionally, regarding the impact of environmental conditions on cost and profit inefficiency, we reveal two important issues. First, the inclusion or not of nontraditional outputs does not influence the direction of the impact of the determinants of cost (profit) inefficiency. Second, since we have taken control for regulations related with the three pillars of Basel II and restrictions on bank activities the results suggest that those regulations ensure banks are well run (improve cost and profit efficiency, on average).

**2. Abstract**

Garden center managers face multiple challenges including identifying their market, analyzing their current and potential consumer base, determining their market focus and developing an advertising program that will convince customers to patronize their business. Previous industry surveys have focused on market identification, consumer characterization, determination of why customers select specific garden centers, and evaluation of customer satisfaction with plant material and service quality. However, little research has been conducted to assist retail nurserymen in assessing the effectiveness of their advertising and promotional programs. The primary goal of this study was to provide industry participants with insight regarding the effectiveness of advertising and promotional programs of independent garden centers. With this information, managers can evaluate and improve individual advertising campaigns. A secondary goal was to gather data that will assist managers in identifying their customer base. To achieve these goals, the study focused on three objectives:

1. Identify and characterize customers of independent garden centers in two metropolitan marketing areas in North Carolina.
2. Determine advertising and promotional program effectiveness on influencing customers to shop at the garden centers and to purchase specific products.
3. Recommend changes garden center managers could make to improve their marketing, advertising and

promotional programs.

**Q 2.** You are heading research activity for a Men's Magazine that is to be launched shortly. The management of the magazine is interested in knowing the preferences of the prospective readers of the magazine. Plan a research design to conduct this research about the expectation from the magazine. Discuss the required aspect of the research design.

**Q. 3 a)** Discuss the sampling in research using examples . How is sample size determined?  
**b)** Discuss the ranking and rating scales used in data collection.

**Q. 4 a)** What is data? What are types of data? How are data collected?  
**b)** What is research process? Using an example explain.

**Q.5 a)** What issues are important in presenting the research report?  
**b)** What are experimental designs? Discuss the types of experimental designs and explain the difference between them.

**Q. 6 a)** What is internal and external validity? What are the factors affecting validity? How the research design is selected depending upon the choice of the type of validity?  
**b)** What is research proposal? What are the content of research proposal? Why is it necessary to have research proposal in place?

## SECTION B

**Q.1. a)** The theory predicts that the proportion of the beans in the groups A,B,C and D should be 9: 3 :3: 1 . In an experiment among 3200 beans , the number in the four groups were 1764 , 626 , 574, 236. Does the experimental result support the theory ?  
( Chi-square value at 1 % l.s. for 2,3,4,6,d.f. is 13.8 , 16.2,18.4,22.4 respectively )

**b)** A survey of 200 firms found the following evidence regarding profitability and market share :

Profitability	Market share		
	up to 10%	11-25%	greater than 25%
Low	36	14	16
Medium	26	22	16
High	16	24	30

Do you find that the data gives you sufficient evidence to conclude that market share are related to profitability ? Test the hypothesis at 1 % level of significance . ( Chi-square value at 1 % l.s. for 2,3, 4,6, d.f is 13.8 , 16.2,18.4,22.4 respectively )

**Q.2. a)** In a sample of 400 parts manufactured by a factory, the number of defective parts was found to be 30 . The company however claims that only 5 % of their product is defective . Is the claim tenable?

**b)** Intelligence test given to two groups consisting of 121 girls and the other group consisting of 81 boys give the following results :  
 Group of Girls : Mean 84 , Standard Deviation 10 ,  
 Group of Boys : Mean 81 , Standard Deviation 12,  
 Examine whether if the difference is significant

**Q.3 a)** Ten students are selected at random from a school and their height are found to be ,in inches, 50,52,52, 53, 55,56,57,58,58,59 . In the light of these data discuss the suggestion that the mean height of the school students is 54 inches . You may use 5 % level of significance ( given Chi-square at 9 d.f is 8.343 and Students t at 9 d.f. is 2.262 )

**b)** Students were given intensive coaching and tests were conducted at the beginning and end of the coaching result of tests are given below: Test at 5 % l.s whether the data shows any improvement in the students. ( Given t value at 8,9, 10 d.f. at 5% Ls. As 2.306, 2.262, 2.228 respectively )

Score at beginning :	33	12	36	46	55	42	48	44	65	61
Score at end :	42	23	46	44	58	64	47	55	77	75

**Q.4.** The following represents the number of units of production per day turned out by four different workers five different types of machines :

Workers	Machine Type				
	A	B	C	D	E
W1	4	5	3	7	6
W2	5	7	7	4	5
W3	7	6	7	8	8
W4	3	5	4	8	2

On the basis of information can it be concluded that

(i) The mean productivity is the same for different machines ?

(ii) The workers don't differ with regard to productivity?

(Given at 5% l.s.  $F(3,16)=5.29$ ,  $F(4,16)=4.77$ ,  $F(3,19)=5.01$ ,  $F(4,19)=4.50$ ,  
 $F(3,11)=6.22$ ,  $F(4,11)=5.87$ ,  $F(5,11)=5.32$  )

Q.5. a) In a Large city 20 % of a random sample of 1100 school boys had a certain physical defect. In another large city , 200 out of a random sample of 900 school boys had the same defect. Do you think that percentage is less in the former city?

b) By using the following data , find out the lines of regression x on y and compute Karl Pears. Coefficient of correlation :

X :	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Y :	5.3	5.7	6.3	7.2	8.2	8.7	8.4

Q.6.a) Calculate the Rank correlation coefficient between X and Y and discuss the relationship.

X :	104	111	104	118	117	105	108	106	100	105
Y :	57	55	47	50	64	63	66	62	69	61

b) The Librarian of a public library gives you the following average number of books borrowed by its members for each working day . The average is based on 10 weeks .

Mon	Tue	Wed	Thu	Fri	Sat
204	292	242	283	252	275

The Librarian wants you to let him know whether books are borrowed equally on all days. Use 5% level of significance . (Given Chi-square value at 5 d.f. at 5 % l.s. Is 11.07 )

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Set 1.

UNIVERSITY OF MUMBAI  
SEMESTER END EXAMINATION  
RESEARCH METHODOLOGY  
MHRD/ MFM/ MMM/ MIM I SEM II

Max marks 60

Duration 3 hrs

- Note :** 1) Solve any five Questions by selecting at least Two questions from each section.  
2) Each question carries equal marks  
3) Use of Statistical tables and Electronic calculator is permitted

**Section II**

- Q3. Following data show the percentage of firm using computers in different aspects of their business: (12 Marks)

Firm Size	Computer Used		
	Administration	Design	Manufacture
Low	60	24	20
Medium	65	30	28
High	90	44	50

Do you find that the data gives you sufficient evidence to conclude that there is no association in size of computer and its use of computer? Test the hypothesis at 1 % level of significance and comment on your findings.

( Given : Chi-square value at 1 % l.s. for 2,3,4,6,d.f. is 13.8 , 16.2,18.4,22.4 respectively )

- Q.4 Ten young recruits were put through strenuous physical training programme by the army . Their weights (in kg. ) were recorded before and after . Following results were obtained :

Recruit :	1	2	3	4	5	6	7	8	9	10
Weight Before :	50	42	51	70	43	65	68	55	62	72
Weight after :	55	48	59	75	56	69	75	63	70	78

Using t –test comment on the effect of strenuous physical training programme on recruits.

( Given Students t at 8,9,10 d.f at 5% l.s is 2.306,2.262,2.228 )

- Q.5(a) A sample of 800 persons selected randomly from large city gives the result that males are 61 % . Test the hypothesis that the males and females are equal in numbers .Test at 1 % level of significance.

- b) A machine put out 21 defective articles in a sample of 500 articles. Another machine gives 3 defective in a sample of 100 . Are the two machines significantly differ in their performance ?

Set 2.



## Section II

Q.3. a) In Certain cross the types represented by XY, Xy, xY, xy are expected to occur in 9: 5: 4:2 ratio . The actual frequencies were :

XY	Xy	xY	xy
170	120	60	50

Test the goodness of fit of observation to theory.

( Chi-square value at 1 % l.s. for 2,3,4,6,d.f is 13.8 , 16.2,19.4,22.4 respectively )

b) In an experiment on immunization of cattle from tuberculosis the following results were obtained :

	Affected	Not affected
Inoculated	12	26
Not inoculated	16	6

Calculate the chi-square and discuss the effect of vaccine in controlling susceptibility to tuberculosis ( 5 % value of chi-square at one degree of freedom is 3.84 )

Q.4. Ten students were given intensive coaching . Their scores in test were recorded before and after coaching . Following results were obtained :

Recruit :	1	2	3	4	5	6	7	8	9	10
Score Before :	15	12	16	20	23	26	28	18	12	17
Score after :	25	13	19	19	26	29	25	23	20	18

Using t –test comment on the effect of intensive coaching on students score.

( Given Students t at 8,9,10 d.f at 5% l.s is 2.306,2.262,2.228 )

Q.5(a) An advertising firm claims that 20% of all TV viewers watch a specific program .In a random sample of 1000 viewers only 184 were found to be watching this TV Program. Test at 5 % level of significance whether this is sufficient evidence To dismiss the advertisers claim.

b) In a certain diet survey of 500 families the following results were obtained :

	Eating Rice	Not eating Rice
Vegetarian	618	282
Non-vegetarian	82	72

Can we say that the percentage of rice eaters is the same amongst vegetarian and non-vegetarian.

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- b) A survey of 200 firms found the following evidence regarding profitability and market share :

Profitability	Market share		
	up to 10%	11-25%	greater than 25%
Low	36	14	16
Medium	26	22	16
High	16	24	30

Do you find that the data gives you sufficient evidence to conclude that market share are related to profitability ? Test the hypothesis at 1 % level of significance . ( Chi-square value at 1 % l.s. for 2,3, 4,6, d.f is 13.8 , 16.2,18.4,22.4 respectively ) **(8)**

- a) The theory predicts that the proportion of the beans in the groups A,B,C and D should be 9: 3 :3: 1 . In an experiment among 3200 beans , the number in the four groups were 1764 , 626 , 574, 236. Does the experimental result support the theory ?  
( Chi-square value at 1 % l.s. for 2,3,4,6,d.f. is 13.8 , 16.2,18.4,22.4 respectively )

**(8)**

- b) A Stock broker claims that he can predict with 85% accuracy whether a stock market can rise or fall during coming month. As a test he predicts the out come of 68 stocks and is correct in 43 of the prediction. Do this data support the stock brokers claim. **(8)**

- b) Ten students are selected at random from a school and their height are found to be ,in inches, 50,52,52, 53, 55,56,57,58,58,59 . In the light of these data discuss the suggestion that the mean height of the school students is 54 inches . You may use 5 % level of significance ( given Chi-square at 9 d.f is 8.343 and Students t at 9 d.f. is 2.262 )

- b) Students were given intensive coaching and tests were conducted at the beginning and end of the coaching result of tests are given below: Test at 5 % l.s whether the data shows any improvement in the students. ( Given t value at 8,9, 10 d.f. at 5% Ls. As 2.306, 2.262, 2.228 respectively ) **(8)**

Score at

Q.4 a) What is questionnaire ? State different aspects you will consider while designing questionnaire . (7)

Q.1a) What do you mean by Research? Briefly Describe the different steps involved in research process. (7)

b) What are the different types of Research. State the criteria of Good Research

c) What is Research Problem ? Define the main issues which should receive the attention of the researcher in formulating the research problem.

d) Explain the meaning of the following in context of Research Design:

i) Extraneous Variable ii) Confounded relationship

iii) Research hypothesis iv) Experimental & Control groups. (8)

a) Describe , in brief , the layout of Research Report , covering all relevant points.

b) Write note on “ Documentation “ in the context of Research Report.

Q.2.a) Explain the need of Research Design . Describe important concepts relating to Research Design. (7)

Q.2. a) Explain meaning and significance of Research Design. State Features of a good design. (7)

What do you mean by Sample Design ? Explain and Distinguish Systematic Sampling and Cluster Sampling methods. (7)

Q.4. a) Explain different sources of collection of Primary and Secondary data. Explain their advantages and disadvantages. (7)

Q.3. a) What do you mean by Sample Design ? Explain and Distinguish Stratified Sampling and Simple Random Sampling methods. (7)

Q.5.a) What is the meaning of measurement in Research ? Explain the measurement scales (i) Nominal and ( ii) Ordinal with suitable examples. (7)

b) Explain the different sources of Error in Measurement (8)

c) Explain different measurement scales used in Research . Also explain the different sources of Error in Measurement. How will you control these errors.

d) What is the meaning of the measurement in Research ? Explain the different Tests of Sound Measurements.

Q.5. a) What do you understand by tests of measurements . Explain the test of Validity in detail. (7)

Q.

beginning :	13	12	36	46	55	32	48	44	65	61
Score at										
end :	42	23	46	44	58	64	47	55	77	75

- b) Students were given intensive coaching and tests were conducted at the beginning and end of the coaching result of tests are given below. Test at 5 % l.s whether the data shows any improvement in the students. ( Given t value at 8,9, 10 d.f. at 5% Ls. As 2.306, 2.262, 2.228 respectively )

Score at										
beginning :	43	32	61	56	65	32	58	44	55	21
Score at										
end :	52	58	67	45	78	54	87	56	67	25

- Q.6 The following data represents the number of units of production per day turned out by five different workmen using different types of machines.

Workers	Machine Type			
	A	B	C	D
1	44	38	47	36
2	46	40	52	43
3	34	36	44	32
4	33	38	46	33
5	38	42	49	39

(a) Test whether the mean productivity is the same for the four different machine type?

(b) Test whether five men differ with respect to mean productivity. (Given at 5% l.s.  $F(3,16)=5.29$ ,  $F(4,16)=4.77$ ,  $F(3,19)=5.01$ ,  $F(4,19)=4.50$ ,  $F(3,11)=6.22$ ,  $F(4,11)=5.87$ ,  $F(5,11)=5.32$ ) **(15)**

- Q.6. The following represents the number of units of production per day turned out by four different workers five different types of machines :

Workers	Machine Type				
	A	B	C	D	E
W1	4	5	3	7	6
W2	5	7	7	4	5
W3	7	6	7	8	8
W4	3	5	4	8	2

On the basis of information can it be concluded that

- (i) The mean productivity is the same for different machines ?  
 (ii) The workers don't differ with regard to productivity?  
 (Given at 5% l.s.  $F(3,16)= 5.29$ ,  $F(4,16)=4.77$ ,  $F(3,19)=5.01$ ,  $F(4,19)=4.50$ ,  
 $F(3,11)= 6.22$ ,  $F(4,11)=5.87$ ,  $F(5,11)=5.32$ ) (15)

Q.6 a) The Librarian of a public library gives you the following average number of books borrowed by its members for each working day . The average is based on 10 weeks .

Mon	Tue	Wed	Thu	Fri	Sat
204	292	242	283	252	275

The Librarian wants you to let him know whether books are borrowed equally on all days.

Use 0.5 level of significance . ( Given Chi-square value at 5 d.f. at 5 % l.s. is 11.07 )

Q.1(a) A company intends to develop its management information system (MIS) for better and quicker decision making. You, being the only MIS available in the company, are asked to carry out a survey about the effectiveness of the computerisation already implemented by some other company located in your neighborhood. The instruction is such that the survey is to focus on the negative aspects and difficulties faced by the companies in the process of implementation of computerisation (acquisition of hardware and software) and post –implementation phase of MIS. Basically, the survey is to focus on the hurdles and resistance faced by those companies. Design a questionnaire containing ten questions for the proposed survey.

Q.1.(a) You are an MIS student trying to prepare a project report to be submitted to your university as a part of your curriculum . You have chosen a topic " Job Satisfaction vs. Commitment to Job" in your Organisation . You want to Study the subject effectively at different hierarchical levels. Design a questionnaire containing ten questions for the proposed report.

Q.4.(a) From the data given below test whether the difference between the population mean is significant or not .

	No. of items	Mean	S.D.
Sample A :	120	181.5	3.0
Sample B :	130	171.0	3.6

Q.4.(a) The means of the two random samples of 1000 and 2000 are 67.5 and 68.0 inches respectively. Can the samples be regarded to

have drawn from the same population of standard deviation 9.5 inches? Test at 5 % level of significance.

- b) A Stock broker claims that he can predict with 75% accuracy whether a stock market can rise or fall during coming month. As a test he predicts the out come of 168 stocks and is correct in 153 of the prediction. Can we accept the stock brokers' claim.