Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Management Studies
End Sem Examination May-2024
MS5CO26 Business Research Methods

Programme: MBA Branch/Specialisation: Management

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Q.1 i. What does quantitative research measures? **1**

(a) Feelings and opinions (b) Numbers and figures

(c) Numbers and feelings (d) Figures and feelings

ii. What is the purpose of doing research? **1**

(a) To identify problem (b) To find the solution

(c) Both (a) and (b) (d) None of these

iii. Testing hypothesis is a _____. **1**

(a) Inferential statistics (b) Descriptive statistics

(c) Data preparation (d) Data analysis

iv. Types of research design includes _____. **1**

(a) Exploratory research design

(b) Descriptive & Diagnostic research design

(c) Hypothesis-testing research design

(d) All of these

v. A method of collecting primary data in which a number of individuals with a common interest interact is called _____. **1**

(a) Telephone Interview (b) Clinical Interview

(c) Focused Interview (d) Group Interview

vi. Methodology refers _____. **1**

(a) Use of tools, techniques & methods for conducting research

(b) Gathering information

(c) Drafting of report

(d) None of these

vii. To determine whether a set of observed frequencies differ from their corresponding expected frequencies, we could apply the ___. **1**
(a) T test for dependent samples
(b) T test for independent samples
(c) Chi-square test
(d) F test

viii. A group of seven-week-old foal reared on a high protein diet weigh 212, 215, 311, 316, 314, 414, and 416 ounces; a second group of five foals, similarly treated except that they receive a low protein diet, weigh 108, 120, 134, 160 and 193 ounces. Test at 5 per cent level whether there is significant evidence that additional protein has increased the weight of the foal. Calculate degree of freedom _____. **1**
(a) 10 (b) 11 (c) 12 (d) 13

ix. When referencing other works, you have cited within the text of the report you should _____. **1**
(a) State the first and last name of the author
(b) Use the author, date citation method
(c) Use an asterisk and a footnote
(d) Insert the complete citation in parenthesis

x. Which of the following is not one of the seven major parts to the research report? **1**
(a) Results (b) Abstract (c) Method (d) Footnotes

Q.2 i. Explain the concept of creativity in research. **3**
ii. Illustrate any six characteristics of a good research. **3**
iii. What are the applications of research in various fields of management? **4**
OR iv. What are the uses of research applications in business decision making? **4**

Q.3 i. Define extraneous, moderating and mediating variables. **3**
ii. Explain any three types of research design. **7**
OR iii. Discuss various types of research in detail. **7**

Q.4 i. Is there any difference between probability and non-probability sampling technique? Which would you like? Justify your answer. **4**
ii. What is scaling? Explain the significance of scaling in research. **6**
OR iii. What is the cause of going for sampling? Which method according to you is the best method and why? **6**

Q.5 i. Develop a Likert scale for measuring the opinion of the customers who are regularly visiting retail stores. **4**
ii. Two research workers classified some people in income groups on the basis of sampling studies. Their results are as follows: **6**

Investigators	Income Groups		
	Poor	Middle	Rich
A	160	30	10
B	140	120	40

Show that the sampling technique of at least one research worker is defective. (use $\chi^2 = 5.991$)
OR iii. A machine is designed to produce insulating washers for electrical devices of average thickness of 0.025cm A random sample of 10 washers was found to have an average thickness of 0.024cm with a standard deviation of 0.002cm Test the significance of the deviation. (Use table value of t as 2.262) **6**

Q.6 Attempt any two:
i. "Research report writing is more of an art which is based upon practice and experience of the researcher". Explain the statement. **5**
ii. Is there any difference between a technical report and a popular report? If yes, justify your answer with suitable examples. **5**
iii. What is a report? Discuss its need in the research work. **5**

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Scheme of Marking

Faculty of Management Studies
End Sem Examination May-2024
Business Research Methods (T) - MS5CO26 (T)
Programme: MBA | Branch/Specialisation:

Q.1	i)	**b. Numbers and figures**	**1**
	ii)	**c. Both a and b**	**1**
	iii)	**a. Inferential statistics**	**1**
	iv)	**d. All of the above**	**1**
	v)	**d) Group Interview**	**1**
	vi)	**a. Use of tools, techniques & methods for conducting research**	**1**
	vii)	**c. Chi-square test**	**1**
	viii)	**b. 11**	**1**
	ix)	**b. Use the author, date citation method**	**1**
	x)	**d. Footnotes**	**1**
Q.2	i.	Concept of creativity in research – **As per explanation**	**3**
	ii.	Six characteristics of a good research – **0.5Marks x 6 = 3**	**3**
	iii.	What are the applications of research in various fields of management? – **0.5Marks x 8 = 4**	**4**
OR	iv.	What are the uses of research applications in business decision making? – **As per explanation**	**4**
Q.3	i.	Extraneous, Moderating & Mediating Variables – **1Marks x 3 = 3**	**3**
	ii.	Explain any three types of research design? – **2Marks x 3 + 1 Example = 7**	**7**
OR	iii.	Various types of research – **2Marks x 3 + 1 Example = 7**	**7**
Q.4	i.	Is there any difference between probability and non-probability sampling technique? Which would you like? Justify your answer. **– 1Marks x 2 + 2 Marks for Justification = 4**	**4**
	ii.	What is scaling? Explain the significance of scaling in research. **– 1Marks + 1Marks x 5 = 6**	**6**
OR	iii.	Cause of going for sampling? Which method according to you is the best method and why? – **As per explanation**	**6**
Q.5	i.	Develop a Likert scale for measuring the opinion of the customers who are regularly visiting retail stores. – **As per explanation**	**4**
	ii.	Two research workers classified some people in income groups on the basis of sampling studies. Their results are as follows: **Investigators** | **Income Groups: Poor** | **Middle** | **Rich** | **Total** A | 160 | 30 | 10 | **200** B | 140 | 120 | 40 | **300** **Total** | **300** | **150** | **50** | **500** Show that the sampling technique of at least one research worker is defective. (use $\chi^2 = 5.991$) **Ans: $\chi^2 = 55.54$** **Null Hypothesis is rejected and this means that the sampling technique adopted by two investigators differ and are not similar.** **1Marks – Hypothesis** **1Marks for Degree of Freedom Calculation** **3Marks - Calculation** **1Marks – Conclusion** **Total 6 Marks**	**6**
OR	iii.	A machine is designed to produce insulating washers for electrical devices of average thickness of 0.025cm A random sample of 10	**6**

		washers was found to have an average thickness of 0.024cm with a standard deviation of 0.002cm Test the significance of the deviation. (Use table value of t as 2.262) **Ans: t = - 3.162** **Null Hypothesis (H0): The average thickness of washers produced by the machine is equal to 0.025cm.** **Alternative Hypothesis (Ha): The average thickness of washers produced by the machine is not equal to 0.025cm.** **Substituting the values, we get:** **t = (0.024 - 0.025) / (0.002 / √10)** **t = -3.162** **Interpreting the t-value:** **The t-value obtained (-3.162) is less than the critical value of t at 5% level of significance (2.262). This means that the difference between the sample mean and the population mean is statistically significant.** **Rejecting or Accepting the Null Hypothesis:** **We reject the null hypothesis (H0) and accept the alternative hypothesis (Ha) because the t-value is outside the critical region.** **Conclusion:** **The average thickness of washers produced by the machine is significantly different from the expected average thickness of 0.025cm.** **1Marks – Hypothesis Formulation** **1Marks – Degree of Freedom Calculation** **3Marks – Calculation** **1Marks – Conclusion** **Total 6 Marks**	
Q.6		Attempt any two:	

	i.	"Research report writing is more of an art which is based upon practice and experience of the researcher". Explain the statement. **– As per explanation**	**5**
	ii.	Is there any difference between a technical report and a popular report? If yes, justify your answer with suitable examples. **– As per explanation**	**5**
	iii.	What is a report? Discuss its need in the research work. **– 1Marks + 1Marks x 4 = 5**	**5**

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Hypothesis Testing:

Hypothesis testing is a statistical method used to determine whether there is enough evidence in a sample of data to infer that a certain condition is true for the entire population.

In this case, we want to test whether the average thickness of washers produced by the machine is significantly different from the expected average thickness of 0.025cm.

Null Hypothesis (H0): The average thickness of washers produced by the machine is equal to 0.025cm.

Alternative Hypothesis (Ha): The average thickness of washers produced by the machine is not equal to 0.025cm.

Calculating the t-value:

The formula to calculate the t-value is:

$t = (\bar{x} - \mu) / (s / \sqrt{n})$

Where:

$\bar{x}$ = sample mean (0.024cm)
μ = population mean (0.025cm)
s = sample standard deviation (0.002cm)
n = sample size (10)

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$\bar{x}$ = sample mean (0.024cm)
μ = population mean (0.025cm)
s = sample standard deviation (0.002cm)
n = sample size (10)

Substituting the values, we get:

$t = (0.024 - 0.025) / (0.002 / \sqrt{10})$
$t = -3.162$

Interpreting the t-value:

The t-value obtained (-3.162) is less than the critical value of t at 5% level of significance (2.262). This means that the difference between the sample mean and the population mean is statistically significant.

Rejecting or Accepting the Null Hypothesis:

We reject the null hypothesis (H0) and accept the alternative hypothesis (Ha) because the t-value is outside the critical region.

Conclusion:

The average thickness of washers produced by the machine is significantly different from the expected average thickness of 0.025cm.

Task b. Two research workers classified some people in income groups on the basis of sampling studies. Their results are as follow:

Investigators Income groups Total

Poor Middle Rich

A 160 30 10 200

B 140 120 40 300

Total 300 150 50 500

Show that the sampling technique of at least one research worker is defective.

Answer

Let us make the hypothesis that the techniques adopted by both the groups are similar and the data is similar also.

Expected frequencies are

investigator	Income groups			total
	poor	middle	rich	
A	120	60	20	200
B	180	90	30	300
Total	300	150	50	500

$$\lambda^2=\sum\frac{(O-E)^2}{E}=\frac{(160-120)^2}{120}+\frac{(30-60)^2}{60}+\frac{(10-20)^2}{20}+\frac{(140-180)^2}{180}+\frac{(120-90)^2}{90}+\frac{(40-30)^2}{30}=55.54$$

Degree of freedom = (3-1)(2-1)=2

Table value of 2 λ^2 for 2 degree of freedom at 5% level of significance is 5.991. Since the calculated value is bigger than the table value, we conclude the rejection of null hypothesis at 5% level of significance. Technique adopted by one of two groups in data collection is defective.