Course Name:	Business Research Methods	Course Code	C204
Roll No.		Marks	60
Total No. of Questions	6	Duration	3 Hours
Total No. of printed pages	5	Date	11.10.2022

Course Outcome Statements:

CO1. DEFINE the basic concepts related to research, research problem, hypothesis, research design, attitude measurement, scaling, sampling, & data processing.

CO2. EXPLAIN the concepts taught through the syllabus of business research methods

CO3. MAKE USE OF processes pertaining to research design, data collection, questionnaire designing, sampling, data processing and hypothesis testing for finding solution to the business research problems.

CO4. EXAMINE the results of various statistical tests from an analytical perspective

CO5. APPRAISE the results of statistical tests for taking business decision.

CO6. DEVELOP a research report consisting of business research problem, research design, sample design, data collection, data analysis and conclusion.

Instructions: -			Marks	BL	CO
Q. No 1 (All Questions are Compulsory)					
Q. No.		**Questions**			
Q. 1		Case/Case-let Study (500-800 words)			
		Crocin, a product of SmithKline Beecham as a subject for market research. Of late, Crocin, an Over-the –counter (OTC) drug, has been advertising on television. The company claims that sales of Crocin have increased by 10% due to the advertising. On the other hand, there have also been concerns among some that advertisements for drugs such as Crocin have a tendency to promote self-medication, and this is a cause for worry, especially among the medical community. There have also been concerns, that such commercials my affect the 'prescription style' of doctors. The general feeling is that doctors have, in fact stopped prescribing Crocin after the widespread airing of the commercial.			
	a.	**Analyse** the information given in the case and suggest the management decision in this problem.	6	Level 4	CO4
	b.	**Decide** relevant key variables for designing questionnaire. .	6	Level 5	CO5
Q. 2		Answer **Any one** from the following.			

	a.	Twelve students were given intensive coaching for one month and their test score were observed before and after coaching. An expert conducted the test and gave the result which is reproduced below **Evaluate** null and alternative hypothesis, assume data is normally distributed and use 5% level of significance to arrive at conclusion relevant to the above investigation		**Level 5**	**CO5**

Paired Samples Test

			Pair 1
			Before – After
Paired Differences	Mean		-8.00000
	Std. Deviation		5.67290
	Std. Error Mean		1.63763
	95% Confidence Interval of the Difference	Lower	-11.60439
		Upper	-4.39561
T			-4.885
Df			11
Sig. (2-tailed)			.000

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
	Before	47.6667	12	12.64432	3.65010
	After	55.6667	12	15.79029	4.55826

(marks: 6)

	b.	Medical college was interested in sampling patients who are suffering from AIDS in south Mumbai region. **Decide** sampling technique could you use to build this sample and rational behind it?	6	**Level 5**	**CO5**
Q. 3		Answer **Any one** from the following.			
	a.	A machine is set to fill a small bottle with 9.0 grams of medicine. A sample of eight bottles revealed the following amounts (grams) in each bottle. At the 5% significance level, **examine** if the mean weight of medicine in the bottle is equal to 9.0 grams?	6	**Level 4**	**CO4**

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Grams	8	8.8000	.22678	.08018

One-Sample Test

		Grams
Test Value = 9	T	-2.494
	Df	7
	Sig. (2-tailed)	.041
	Mean Difference	-.20000
	95% Confidence Interval of the Difference	Lower	-.3896
		Upper	-.0104

	b	The business objective facing the marketing manager at OmniFoods is to develop a model to predict monthly sales volume per store of OmniPower bars and to determine what variables influence sales. Two independent variables are considered here: the price of an OmniPower bar, as measured in cents and the monthly budget for in-store promotional expenditures, measured in dollars In-st ore promotional expenditures typically include signs and displays, in-store coupons, and free samples. The dependent variable Y is the number of OmniPower bars sold in a month. Data are collected from a sample of 34 stores in a supermarket chain selected for a test-market study of OmniPower. All the stores selected have approximately the same monthly sales volume. The snap shot of the data is given below. **Examine** the equation of regression & comment on the robustness of model.	6	Level 4	CO4

Bars	Price	Promotion
4141	59	200
3842	59	200
3056	59	200
3519	59	200
4226	59	400
4630	59	400
3507	59	400
3754	59	400
5000	59	600
5120	59	600
4011	59	600
5015	59	600

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.870[a]	.758	.742	638.065

a. Predictors: (Constant), Promotion, Price

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	39472730.77	2	19736365.39	48.477	.000[b]
	Residual	12620946.67	31	407127.312		
	Total	52093677.44	33			

a. Dependent Variable: Bars
b. Predictors: (Constant), Promotion, Price

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	5837.521	628.150		9.293	.000
	Price	-53.217	6.852	-.690	-7.766	.000
	Promotion	3.613	.685	.468	5.273	.000

a. Dependent Variable: Bars

Q. 4		Answer **Any two** from the following.			
	a.	In an anti-malarial campaign in certain area, Quinine (Medicine) was administered to 812 persons out of 3,248. Below is the snap shot of the data and the output after running the statistical. Comment on the test the usefulness of Quinine in checking malaria. **Construct** the null and alternative hypothesis and test the hypothesis at 5% level of significance. Identify the relevant marker values to do the interpretation and also comment on the appropriateness of the test used	6		

Treatment	Fever	No Fever	Total
Quinine	20	792	812
Non-Quinine	220	2,216	2,436
Total	240	3,008	3,248

Status * Drug Crosstabulation

Count

		Drug		Total
		No Quinine	Quinine	
Status	Fever	220	20	240
	No Fever	2216	792	3008
Total		2436	812	3248

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	38.392[a]	1	.000		
Continuity Correction[b]	37.439	1	.000		
Likelihood Ratio	47.155	1	.000		
Fisher's Exact Test				.000	.000
N of Valid Cases	3248				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 60.00.

b. Computed only for a 2x2 table

Level 3 | CO3

B The data in the following table indicates the psychological health ratings of corporate executives in banking, insurance, and retail sectors. One way ANOVA was applied to test whether the executives of any particular sector are healthier in their psychological health in comparison to other sectors. Snap shot of the data and the output is given below. Test your hypothesis at 5%. Assume the data is normally distributed. **Construct** the requisite null and the alternative hypothesis and identify the relevant markers (values) from the output given below to do interpretation. Also Interpret the result and conclude

Level 3 | CO3

S.N.	Banking	Insurance	Retail
1	45	41	58
2	41	38	54
3	47	43	49
4	59	53	65
5	48	43	51
6	45	42	56
7	38	40	41

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Score	Based on Mean	2.519	2	42	.093
	Based on Median	2.037	2	42	.143
	Based on Median and with adjusted df	2.037	2	37.640	.145
	Based on trimmed mean	2.470	2	42	.097

6

ANOVA

Score

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	549.316	2	274.658	6.243	.004
Within Groups	1847.662	42	43.992		
Total	2396.978	44			

Multiple Comparisons

Dependent Variable: Score

Tukey HSD

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Banking	Insurance	3.321	2.427	.366	-2.58	9.22
	Retail	-5.283	2.384	.080	-11.07	.51
Insurance	Banking	-3.321	2.427	.366	-9.22	2.58
	Retail	-8.605*	2.465	.003	-14.59	-2.62
Retail	Banking	5.283	2.384	.080	-.51	11.07
	Insurance	8.605*	2.465	.003	2.62	14.59

*. The mean difference is significant at the 0.05 level.

	c.	A toothpaste manufacturing company wants to conduct customer satisfaction survey and they claim 25% of the customer use their toothpaste. **Make use of** the data to calculate sample size for the survey if confidence level is 95 % and tolerable error is 5%.	6	Level 3	CO3
Q. 5		Answer **Any two** from the following.			
	a.	**Illustrate** the process of questionnaire designing	6	Level 2	CO2
	b	**Explain** concept of exploratory research design	6	Level 2	CO2
	c.	**Explain** type 1 and type 2 errors	6	Level 2	CO2
Q. 6		Answer **Any two** from the following.			
	a.	**What** is probability sampling	6	Level 1	CO1
	b	**What** is Fundamental research and Applied research	6	Level 1	CO1
	c.	**What** is primary and secondary data	6	Level 1	CO1