SOMAIYA VIDYAVIHAR UNIVERSITY

Trim: June – Nov 24 **Maximum Marks: 25** **Examination: ETE Exam** **Date: 29/11/24** **Duration:1.5 hours**		
Programme code: 09 **Programme: MCA**	**Class:** SY	**Semester/Trimester: III**
College: K. J. Somaiya Institute of Management	**Name of the department/Section/Center:** MCA	
Course Code: 217P09C303	**Name of the Course: Research Methodology**	
Instructions: Question number 1 is compulsory **Solve any three out of question number 2 - 5**		

Question No.		Max. Marks
1	A study of the effect of caffeine on muscle metabolism used Eighteen male volunteers who each underwent arm exercise tests. Nine of the men were randomly selected to take a capsule containing pure caffeine one hour before the test. The other men received a placebo capsule. During each exercise the subject's respiratory exchange ratio (RER) was measured. (RER is the ratio of CO_2 produced to O_2 consumed and is an indicator of whether energy is being obtained from carbohydrates or fats).The question of interest to the experimenter was whether, on average, caffeine changes RER. The two populations being compared are "men who have not taken caffeine" and "men who have taken caffeine". The spss output showed the following: **T-Test** **Group Statistics** GROUP: RER — Placebo: N = 9, Mean = 100.5556, Std. Deviation = 7.6992, Std. Error Mean = 2.5664 GROUP: RER — Caffeine: N = 9, Mean = 94.2222, Std. Deviation = 5.6075, Std. Error Mean = 1.8692 **Independent Samples Test** Levene's Test for Equality of Variances: F = .197, Sig. = .663 t-test for Equality of Means: Equal variances assumed: t = 1.995, df = 16, Sig. (2-tailed) = .063, Mean Difference = 6.3333, Std. Error Difference = 3.1749, 95% Confidence Interval of the Difference: Lower = -.3972, Upper = 13.0639 Equal variances not assumed: t = 1.995, df = 14.624, Sig. (2-tailed) = .065, Mean Difference = 6.3333, Std. Error Difference = 3.1749, 95% Confidence Interval of the Difference: Lower = -.4491, Upper = 13.1158 Based on above information, answer the following questions : 1. Frame the necessary hypothesis (null and alternate) for the study. 2. What are the conditions to use an independent t test? 3. What is the significance value of the test result? 4. Comment on acceptance/rejection of hypothesis based on the result	10
2	Domestic sales of New Zealand wine have reached their highest level ever with 51 million liters of wine sold in 2007. Government policies have	5

also been put in place to support the industry and achieve sustained growth. However, an important question is whether, ultimately, there is enough land devoted to grape cultivation, since the quantity of grapes crushed predominately determines how much wine is produced. Therefore, it might be useful to investigate the relationship between domestic sales of wine and the area of land devoted to wine production. The following excel output displays the results of a regression predicting domestic sales of New Zealand wine (in millions of liters) by producing area (in hectares). Suppose you were asked by the Wine Institute of New Zealand to analyze this data and write a brief report. On the basis of the results below, what would you find?

SUMMARY OUTPUT						
Regression Statistics						
Multiple R	0.658102884					
R Square	0.433099406					
Adjusted R Square	0.370110451					
Standard Error	4.801382127					
Observations	11					
ANOVA						
	df	***SS***	***MS***	***F***	***Significance F***	
Regression Residual Total	1 9 10	158.5096579 207.479433 365.9890909	158.5097 23.05327	6.875799	0.027712	
	Coefficients	**Standard Error**	**t. stat**	**P-value**	**Lower 95%**	**Upper 95%**
Intercept	30.85590683	3.849536982	8.015485	2.18E-05	22.14765	39.56416
Producing Area	0.000633111	0.000241445	2.622175	0.027712	8.69E-05	0.001179

. a) Frame the necessary hypothesis?

b) Comment on strength of model & Standard Error of the Estimate

c) Frame the Equation of regression.

d) Comment on Individual Significance of Independent Variables by flaming required hypothesis.

3	Write a note on Data Editing and Coding	5

4	Differentiate between Categorical and Numerical Variables with examples	5
5	What is a positive and negative correlation? Explain their significance	5