EASTERN UNIVERSITY, SRI LANKA

Faculty of Commerce and Management

...ear, Second Semester Examination in Bachelor of Business Administration (BBA)/ BBA ...tion in Marketing Management)/ BBA (Specialization in Human Resource Management)/ ...elor of Commerce (BCOM)/ BCOM (Specialization in Accounting and Finance)/ BCOM (Specialization in Business Economics) 2015/2016 (July 2018)

(Proper/ Repeat)

Com 3032 Statistical Software Applications in Business

TWO (02) HOURS

...be completed by the candidate:
...amination Index Number: .....

Instructions to Candidates	For Examiner's Use only	
	Question No	Marks
1. This paper has **04** questions in **12** pages.		
2. Answer **all the questions** in **two** hours.	01	
3. Write your answers clearly in the spaces provided on the examination paper.	02	
4. Create a folder with your Index No. (eg:COM XXXX)	03	
5. Create 3 sub folders with the name of the question number (Q01, Q02, Q04)	04	
6. Save the data files and/or output files in the respective folder as per instructions provided under each question		
7. This paper should be handed over personally to the supervisor/ invigilator		
	Total	

Eastern University Sri Lanka
Faculty of Commerce and Management
Third Year, Second Semester Examination in Bachelor of Business Administration (BBA)/B
(Specialization in Marketing Management)/ BBA (Specialization in Human Resource Manage
Bachelor of Commerce (BCOM)/ BCOM (Specialization in Accounting and Finance)/ BCO
(Specialization in Business Economics) 2015/2016 (July 2018)
(Proper/ Repeat)

Com 3032 Statistical Software Applications in Business

nswer All Questions. **Time: 02**

)1. A study has been conducted with 10 attributes of choosing a retail store. A questionnaire on differe items related to 10 attributes of choosing a store has been constructed on 5-point likert type scale ten attributes. The statements are measurable on a Likert scale of 1-5; where 1 indicated strongly disagree and 5 indicated strongly agree. An extract of data collected from 50 respondents are given below.

X_1 = Home delivery
X_2 = Loyalty programmes
X_3 = Decoration at the store
X_4 = Quick service
X_5 = Lighting
X_6 = Advertising

ID. No.	X_1	X_2	X_3	X_4	X_5	X_6
1	5	4	3	4	3	4
2	4	5	4	3	4	5
3	4	4	3	3	4	3
4	3	2	4	3	2	4
5	5	5	2	3	2	5
6	4	4	3	3	2	4
7	3	4	2	2	2	4
8	3	4	4	3	4	3
9	4	3	3	4	3	4
10	5	5	2	2	1	5
11	4	4	4	2	2	5
12	4	5	3	2	3	4
13	4	3	2	3	2	4
14	5	4	2	2	3	5
15	3	5	1	3	2	5

a. Enter this data into a SPSS work sheet in an appropriate manner. Save the SPSS data file with name **Store 1** into the folder **Q 01**.

(04 M

b. Merge the SPSS data files named Retail Store Cases.sav and Retail Store Variables.sav with file crea part (a) in an appropriate order. Save the merged file with name **Retail Store 2** into the folder Q 01.

(03 M

i) Identify the duplicate cases (if any) and remove it from the dataset.
ii) Sort the dataset in ascending order based on 'Identification Number (ID. No.)'. Save the dataset with name **Retail Store 3** into the folder **Q 01**.

(02 Marks)

Conduct factor analysis (use Principal component method for extraction and Varimax method for rotation) for the variables in the data file **Retail Store 3**. Use the results of the analysis to answer the following questions.

Is the data suitable for the factor analysis? Justify your answer. **(02 Marks)**

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How many factors have been extracted? Justify your answer. **(03 Marks)**

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What is the explained variance for each of the extracted factors, and what is the cumulative explained variance for all extracted factors combined?

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(02 Marks)

Explain which variables belong to each factor. What would be appropriate labels for the factors extracted? Provide justification for your answer.

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(03 Marks)

h. Interpret the table titled "Component Transformation Matrix".

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i. What is the reliability of each of the extracted factors with regard to choosing a retail store?

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j. Compute new variables for the factors extracted to get the average values of the factors to e
(*Hint: Calculate the average of loaded variables under each factor*).

k. Obtain the relevant statistics for each factor, complete the table below and interpret the results.

	Factor 1:.....	Factor 2:.....	Factor 3:.....
Mean			
Standard deviation			
Minimum			
Maximum			

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Create three new variables (*Hint: Use Recode into different variables command*) to show the level of each extracted factors with regard to choosing retail store. Follow the guidelines mentioned below to recode the variables.

Range of average scale	Level
1.00-2.49	Low level
2.50-3.49	Moderate level
3.50-5.00	High level

(03 Marks)

Carry out a frequency analysis on the three variables you created in question (I) and complete the table below:

Level	Factor 1:.....		Factor 2:.....		Factor 3:.....	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Low level						
Moderate level						
High level						

(03 Marks)

Obtain suitable charts to show the frequency of the variables you created in question (I) and interpret those charts. **(02 Marks)**

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Save the SPSS data files (Retail Store 1, Retail Store 2 and Retail Store 3) and output file (Retail Store.spv) obtained for question 01 into the folder **Q 01**.

(Total: 40 Marks)

Deleven Company produces and sells mobile phone accessories. The company currently markets in three provinces; Western province, Eastern province and Central province. The Company plans to spend a big amount of money for both advertising and giving bonuses to employees in order to increase the sales. The management of the Company wants to determine whether advertising and bonus have significant impact on sales. In addition to that, it needs to test whether the choice of province has an impact of sales. The data are stored in file Sales.sav.

Identify the dependent and independent variables in the given dataset? **(02 Marks)**

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b. Obtain bivariate correlations between the variables. Complete the following table based on the obtained and comment on the relationship between the variables.

Pearson Correlation

	Advertisement Expenditure	Bonus Expense
Sales		

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(02

Perform the multiple regression analysis using the dependent variable and **two** independent v (***Exclude the categorical variable***) in an appropriate manner.

c. Test the overall utility of the model. Justify your answer. (02

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d. Comment on the results in 'Model Summary' table. (02

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e. Determine whether each independent variable makes a significant contribution to the regression m at 5% level of significance. Justify your answer. (03

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Write the multiple regression equation for Sales and interpret the regression coefficients. **(04 Marks)**

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Create two dummy variables (D1 & D2) to assign numeric codes for the nominal variable, "Province", using ***Recode into different Variables*** command. Assign the numeric codes for the dummy variables as shown in the table below. **(02 Marks)**

Province	D_1	D_2
Western Province	0	0
Eastern Province	0	1
Central Province	1	0

Perform Multiple regression analysis again using the dependent variable and **four** independent variables (***Include new recoded variables of Province; D1 and D2 in the model***).

Write down the multiple regression equation for Sales. **(02 Marks)**

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Write down three separate regression models, based on 'province', from the model obtained in part (h).

Model for Western province:

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Model for Eastern province:

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Model for Central province:

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(03 Marks)

What is the amount of sales would you expect when the company spends Rs.18,000 for advertisement and Rs.15,000 for bonus in Central province? **(02 Marks)**

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Save the SPSS data file and output file obtained for question 02 with the name **Sales** into the folder **Q 02.**

(Total: 25 Marks)

03. A In a recent test of the effectiveness of a new sleeping pill, two groups of patients were selec group was given the drug and the second group was given a placebo. Number of minutes it t patient to fall asleep was recorded. Following outputs were obtained in the analysis of data to de whether the new drug is effective.

Tests of Normality							
	Patient Group	Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Time taken to fall asleep	Drug Group	.117	25	.200	.971	25	.67
	Placebo Group	.127	25	.200	.961	25	.42

Group Statistics					
	Patient Group	N	Mean	Std. Deviation	Std. Error Mean
Time taken to fall asleep	Drug Group	25	22.96	13.186	2.637
	Placebo Group	25	28.20	16.148	3.230

Independent Samples Test			
		Time taken to fall asleep	
		Equal variances assumed	Equal variances not assumed
Levene's Test for Equality of Variances	F	.290	
	Sig.	.593	
t-test for Equality of Means	t	-1.257	-1.2
	df	48	46.
	Sig. (2-tailed)	.215	.2
	Mean Difference	-5.240	-5.2
	Std. Error Difference	4.170	4.1

i. Identify the test being performed and state the main assumption made in performing this test. (02

Test: .....

Main Assumption:

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ii. Test the validity of this assumption. Clearly state the hypotheses, p-values, statistical decisio conclusions. (04

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What conclusion can be made from the Levene's test? **(03 Marks)**

State the null and alternative hypotheses for the t-test. **(02 Marks)**

What is the p-value of this t test? **(02 Marks)**

What statistical decision can be made at 5% level of significance? State your conclusion. **(02 Marks)**

Statistical decision:

Conclusion:

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B A more efficient experiment than the one described in part (A) was carried out to determine whether sleeping pill was effective. Each person in a random sample of 25 patients was given the two treatments drug and placebo. The order in which these treatments were administered was randomly chosen for person in the sample. The following results were obtained in the analysis of data.

Paired Samples Test			
			Drug - Placebo
Paired Differences	Mean		-10.440
	Std. Deviation		9.950
	Std. Error Mean		1.990
	95% Confidence Interval of the Difference	Lower	-14.547
		Upper	-6.333
t			-5.246
df			24
Sig. (2-tailed)			.000

i. Explain why this experiment is more efficient than the one described in for the same investigation in (A)? (02

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ii. Identify the test being performed and state the assumptions made in performing this test. (03

Test: .....

Assumptions:

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iii. State the null and alternative hypotheses for the t-test. (02

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What is the p-value of this t test? **(02 Marks)**

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What statistical decision can be made at 5% level of significance? State your conclusion. **(02 Marks)**

Statistical decision:

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Conclusion:

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(Total: 25 Marks)

A firm is considering an organizational change by adopting the use of self-managed work teams. To assess the attitudes of the employees of the firm towards this change, a sample of 400 employees was selected and asked whether they favour the institution of self-managed work teams in the firm. Three levels of attitudes namely, favour, neutral and oppose were measured among four types of jobs such as hourly workers, supervisors, middle management and upper management in the firm. The data has been stored in Survey.sav. The management wants to test whether there is an association between the type of job and the attitudes towards self-managed work teams.

What is the appropriate chart to test the association between two categorical variables in the problem?

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(01 Mark)

Obtain the chart you mentioned in part (a) and interpret the results. **(02 Marks)**

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c. Obtain the Crosstabulation table for the two categorical variables with expected counts and com the association between two variables based on the Crosstabulation table. (0

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d. What is the statistical technique to test the association between two categorical variables? (0

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e. State the appropriate null and alternative hypotheses for the test you need to carry out. (02

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f. Perform the test you mentioned in part (d) and state the statistical decision and conclusion at 5% le significance. (02 M

Statistical decision:

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Conclusion:

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Save the SPSS output file obtained for question 04 with the name **Survey** into the folder **Q 04.**

(Total: 10 M

Instruction

Save the folders Q 01, Q 02, and Q 04 into the folder named with your index number (MS/COM xxxx)