EASTERN UNIVERSITY, SRI LANKA

Examination (Insert official title of the examination, as it appears at the head of the question paper) .....

Title of paper COM 3032 Statistical Software Application in Business

Index Number (Write very clearly) .....

Instructions to Candidates	For Examiner's Use only	
	Question No	Marks
1. Write your answers clearly in the spaces provided on the examination paper. 2. Create a folder with your Index No. (eg:COM xxxx) 3. Create sub 4 sub folders with the name of the question number (Q 01, Q 02, Q 03, Q 04) 4. Fasten any supplementary paper at the end of the examination paper. 5. This paper should be handed over personally to the supervisor/ invigilator	01 02 03 04	
	Total	

Eastern University, Sri Lanka
Faculty of Commerce and Management

Third Year, Second Semester Examination in Bachelor of Business Administration/ Bachelor of Business Administration (Specialization in Marketing Management)/ Bachelor of Business Administration (Specialization in Human Resource Management)/ Bachelor of commerce/ Bachelor of commerce (Specialization in Accounting and Finance) 2011/2012 (August 2014) (Proper/Repeat)

Com 3032 Statistical Software Applications in Business

Answer All Questions **Time: 02 Hours**

Alfa Roofing and Siding Company sells roofing and siding products to home repair retailers and commercial contractors. The owner is interested in studying the effects several variables on the value of pebbles sold. The marketing manager is arguing that the company should spend more money on advertising, while a market researcher suggests it should focus on making its brand and product more distinct from its competitors. The company has 26 marketing regions. In each region, it collected information on the following variables: volume of sales (in thousands of rupees), advertising Rupees (in thousands), number of active accounts, number of competing brands and a rating of region potential. The data are stored in columns 1 to 5 in the data editor of SPSS in file **SalesofAlfa.sav.**

a) Obtain four scatter diagrams showing relationship between sales volume with each of independent variables. Comment on the relationship between dependent and independent variables based on the scatter diagrams obtained.

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b) Obtain the correlation matrix. Complete the following table based on the output obtained and compare it to the relationships you saw in the scatter plots.

	Sales volume and Advertising rupees	Sales volume and Number of active accounts	Sales volume and Number of competitors	Sales volume and Region potential
Correlation coefficient				

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c) Obtain the multiple regression equation to predict sales volume from advertising rupees, number of a number of competitors and rating of region potential. Report the regression equation based on the out obtained.

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d) Interpret the coefficient of multiple determination, R^2 for this problem.

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e) Determine whether there is a significant linear relationship between sales volume and some of the four inde variables: advertising rupees, number of accounts, number of competitors and rating of region potential. [Use

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f) Determine whether each independent variable makes a significant contribution to the prediction of sales volu

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g) On the basis of decisions you made in (f), are there any independent variables that should be dropped equation? If so, obtain the refined regression equation so that all the remaining variables are significant, and

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h) Interpret the meaning of the coefficients of the independent variables of the refined regression equation.

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Save the SPSS output file obtained for question 01 with the name **SalesofAlfa** into the folder **Q 01**

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A sample of 25 final year undergraduates of a University in Sri Lanka answered the following questions in a survey.

1. What is your gender? .....
2. What is your faculty of study? .....
3. How many hours do you spend in the university library weekly? .....
4. What do you expect your monthly salary to be immediately after completion of the degree programme? .....
5. How satisfied are you with the student advisement service of the university? .....
   [Very unsatisfied = 1 , Unsatisfied = 2, Neutral = 3, Satisfied = 4, Very satisfied = 5]

The data collected from the 25 students were organized in the table given below.

Student Number	Gender	Faculty	Hours spending in Library	Expected monthly salary (Rs.)	Satisfaction
01	Male	Science	05	40000	3
02	Female	Management	04	25000	4
03	Female	Management	06	24000	5
04	Female	Arts	06	20000	3
05	Male	Arts	02	22000	3
06	Female	Arts	04	15000	1
07	Male	Management	04	50000	4
08	Female	Science	07	25000	5
09	Male	Arts	03	20000	4
10	Female	Science	05	18000	5
11	Female	Science	08	23000	4
12	Female	Management	03	35000	5
13	Male	Management	05	75000	5
14	Male	Arts	04	25000	3
15	Male	Science	07	50000	4
16	Male	Arts	05	28000	2
17	Female	Science	09	35000	1
18	Female	Science	07	25000	4
19	Male	Management	07	60000	4
20	Male	Science	06	42000	3
21	Female	Arts	06	18000	2
22	Male	Arts	05	24000	4
23	Male	Science	04	30000	2
24	Female	Management	06	24000	4
25	Female	Arts	07	15000	3

Consider the information recorded in the above table.

a) Which of the variables in the data set are quantitative? Which are qualitative?

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b) For each qualitative variable in the data set (if any), determine if it is nominal or ordinal?

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c) Using SPSS, create a data file for the above dataset. Save the SPSS data file with the name, **survey**

d) Create Numeric codes for the nominal variable, "Gender", using ***Recode into Same Variables***. Attach value la describe what each value in the new variable represents.

e) Create a new variable by recoding the responses for the variable, "Faculty" using ***Automatic Recode***. Name variable as "RC_Faculty".

f) Create a new variable which breaks the data into 3 groups as follows, by recoding the variable "Expected salary" using ***Recode into different variable***.

Expected monthly salary	Below 25000	25000 - 50000	Above 50000
Code	1	2	3

Name the recoded new variable as "RC_Salary". Attach value labels to describe what each value in the new v represents. Save the data file with the same name **survey**.

g) Obtain the frequency table for the variable, "RC_Salary". Complete the following table using the frequency obtained.

	Below 25000	25000 -50000	Above 50000
Frequency			
Percentage			

h) Obtain the descriptive statistics for the variable, "Hours spending in library". Complete the following table output you got.

Variable	Mean	Standard deviation	Skewness	Kurtosis
Hours spending in library				

Consider the information recorded in the above table.

i) How long a final year undergraduate student spends time in the library per week? .....

ii) How the data obtained for the variable, "Hours spending in library" are clustered around the mean?

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iii) Using the measures, skewness and kurtosis, comment on the shape of the distribution of "Hours sp library".

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I) i) What chart is appropriate to examine the association between the variables, "Faculty" and "RC_Salary"?

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ii) Obtain the chart you suggested in the above part and comment on the association between "Faculty" and "RC_Salary".

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J) Cross tabulate the variables "Gender" and "Satisfaction". Using the output obtained, explore the final year undergraduates' level of satisfaction on student advisement service of the university by gender.

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

(Total 40 Marks)

The quality control director for a clothing manufacturer wants to study the effect of machines on the breaking strength (in Kg) of wool serge material. 36 square-meter pieces were randomly assigned to three different machines A, B and C for the experiment. The results of the experiment are recorded which are in the data file **Breakstr.sav**

a) Obtain box plots on the same scale for three machines A, B, and C. Describe the structure you see.

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b) Obtain the mean plot. Which type of machine appears to have the highest average breaking strength? Which has the lowest?

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c) Which parametric statistical technique could be used to determine whether there are any differences ar machines in terms of average breaking strength?

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d) State the null and alternative hypotheses to perform the parametric statistical technique that you choose in

Null hypothesis: .....

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Alternative hypothesis: .....

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e) Perform the parametric statistical technique that you choose in part (c) at 5% level of significance. What decision can be made? State your conclusion.

Statistical decision: .....

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Conclusion: .....

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f) If appropriate, perform the Post-hoc analysis to examine the differences among machines. Based on t obtained state which pairs of machines are significantly different from each other, in terms of averag strengths and why?

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g) Using the box plots obtained In part (a), check whether the assumptions of normal distribution and equa are satisfied for the statistical technique that you choose in part (c)?

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h) If the assumption(s) you checked in part (g) is/are not valid, what alternative method do you propose to perform the analysis?

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Save the SPSS output file obtained for question 03 with the name **Breakstr** into the folder **Q 03**

(Total 20 Marks)

The production manager of MPS Audio Systems is concerned about the idle time of workers. In particular he would like to know if there is a difference in the idle minutes for workers on the day shift and the evening shift. The number of idle minutes for the five day - shift workers and the six evening-shift workers are stored in the data editor of SPSS in file **MPSaudio.sav**. Perform the Mann – Whitney U test to determine whether there is a difference in the idle minutes for workers on the day shift and the evening shift.

a) State the null and alternative hypotheses for the above problem.

Null hypothesis: .....

Alternative hypothesis: .....

b) What statistical decision can be made at 5% level of significance? State your conclusion.

Statistical decision: .....

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Conclusion: .....

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c) What parametric technique could be used to address this problem?

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d) What assumptions should you check for when using the technique that you chose in part(c), above?

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Save the SPSS output file obtained for question 05 with the name **MPSaudio** into the folder **Q 05**

(Total 15

*Instruction:

Save folders Q 01, Q 02, Q 03, Q 04 into the folder named with your index number (MS/COM xxxx)