EASTERN UNIVERSITY, SRI LANKA

FACULTY OF COMMERCE AND MANAGEMENT

DEPARTMENT OF COMMERCE

Year, Second Semester Examination in Bachelor of Business Administration/ Bachelor of siness Administration (Specialization in Marketing Management)/ Bachelor of Business ration (Specialization in Human Resource Management)/ Bachelor of Commerce/ Bachelor of Commerce (Specialization in Accounting and Finance) - 2016/2017 (July/August 2019) (Proper/ Repeat)

Com 3032 Statistical Software Applications in Business

TWO (02) HOURS

To be completed by the candidate:

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 4 sub folders with the name of the question number (Q01, Q02, Q03, 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	

01. A study was conducted for choosing the best training method to train the employees about o new production system. Sixty employees were divided into three groups. Group 1 got me training; group 2 got method two training and group 3 got method 3 training. Each employee v at the end of the training course and their score was recorded. An extract of data collecte respondents is given below.

Score on Training Exam		
Training Method One	**Training Method Two**	**Training Method Three**
63.3	72.9	82.3
68.3	88.2	89.7
86.7	65.8	81.0
52.8	71.3	85.1
75.0	81.5	74.1
58.0	67.6	75.9
69.5	73.0	74.7
32.7	81.4	81.1
60.9	83.0	76.4
58.2	76.0	81.8
45.5	77.4	83.3
44.9	69.3	81.7
67.0	61.7	71.8
63.0	64.9	81.0
66.6	75.4	78.7
65.5	59.8	84.9
59.6	89.7	77.5
75.7	59.1	79.4
64.6	76.1	73.9
83.7	74.5	81.4

a. Enter this data into a SPSS work sheet in an appropriate manner. Save the SPSS data file **Training Score** into the folder **Q 01**.

b. Construct box plots for the scores of three training methods on the **same graph** and variances in scores among the three training methods. Also comment on the distribution scores of the three training methods.

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btain the relevant statistics for each training method, complete the table below and interpret the esults.

	Training Method One	Training Method Two	Training Method Three
Mean			
Standard deviation			
Minimum			
Maximum			

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(05 Marks)

reate a new variable to show the level of training exam scores (*Hint: Use Recode into different variables ommand*). Follow the guidelines mentioned below to recode the variables.

ariable name: Level

abel: Level of training exam scores

Range of average scale	Level
00-49.99	Low level
50-74.99	Moderate level
75-100	High level

(03 Marks)

arry out a frequency analysis on the variable you created in question (d), complete the table below and nterpret the findings in the table.

Level	Training Method One		Training Method Two		Training Method Three	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Low level						
Moderate level						
High level						

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(05 M

f. What is the suitable parametric test to compare the means of the training scores among the methods of trainings? (01

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g. State the assumptions that must be valid to perform the above mentioned test. (02 M

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h. Perform the test you mentioned in part (f). Clearly state the null and alternative hypotheses for t and the conclusion of the test.

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Null hypothesis:

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Alternative hypothesis:

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Statistical decision:

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Conclusion:

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i. Is it necessary to perform a 'post hoc' test? Explain.

(02 Marks)

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What is the best training method?

(01 Mark)

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Save the SPSS data file (Training Score.sav) and output file (Training Score.spv) obtained for question 01 into the folder **Q 01**.

(Total: 30 Marks)

XYZ Company produces sportswear garments and export to foreign buyers. It operates only one factory which is situated at Ratmalana. The factory currently has three departments: Production, Cutting and Finishing. The Company plans to both increase the salary level and spend a big amount of money for giving incentives to employees in order to increase the productivity of employees. The management of the Company wants to determine whether salary and incentives have significant impact on productivity. In addition to that, it needs to test whether the department where employees work has an impact on productivity. The data are stored in file Productivity.sav. Productivity of employees is measured in a scale from 0 to 200 where 200 indicated highest productivity. Salary and incentives were measured in thousand (000) rupees.

a. 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 output obtained and comment on the relationship between the variables.

Pearson Correlation

	Salary	Incentives
Productivity		

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(03 Marks)

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

c. Test the overall validity of the model. Justify your answer.

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

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

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f. Write the multiple regression equation for Productivity and interpret the regression coefficien

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

Department	D_1	D_2
Production	0	0
Cutting	0	1
Finishing	1	0

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

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

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

Model for Production Department:

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Model for Cutting Department:

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Model for Finishing Department:

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(03 Marks)

What is the amount of productivity would you expect when the company pays Rs.18, 000 for salary and Rs.15, 000 for incentives in Cutting department? **(02 Marks)**

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

(Total: 25 Marks)

A Suppose that, over the years, forecasters have determined the mean high temperature in a particular city during the month of February to be 34° C. The high temperatures for each of the 28 days of February of this year are available in '*Temp_2019.sav*.' Use this dataset for answering questions i to v.

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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Save the SPSS output file (*Temp.spv*) obtained for question 03-part A into the folder **Q 03** and close it.

A study was conducted to compare the absenteeism levels of employees in two departments: Planning and Controlling. The number of days the employees were absent in two departments was recorded and stored in the files **Absent_Plan.sav** and **Absent_Cont** . The researcher is of the view that there is a significant difference in their absenteeism levels.

Merge the dataset '*Absent_Plan.sav*' with the dataset '*Absent_Cont.sav*' in a proper manner and save in the name '*Absenteeism.sav*'. Use this new dataset to answer questions ii to v.

(01 Mark)

What is the appropriate parametric statistical test to examine researcher's claim?

(01 Mark)

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

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What conclusion can be made from the Levene's test? **(04 Marks)**

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v. What is the p-value of this t test? (01 M

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vi. What statistical decision can be made at 5% level of significance? State your conclusion. (03 Ma

Statistical decision:

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Conclusion:

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Save the SPSS data file (*Absenteeism.sav*) and output file (*Absenteeism.spv*) obtained for question 03-B into the folder **Q 03**.

(Total: 25 M

04. A A company is interested in offering its employees one of two employee benefit packages: Package A Package B. The company needs to know whether the employees of this company give more prefe for Package B than Package A. A random sample of the company's employees is collected, and person in the sample is asked to rate each of the two packages on an overall preference scale of 0 to The order of the presentation of each of the two plans is randomly selected for each person i sample. The collected data has been stored in '*Benefit.sav*.'

i. What type of t-test should be carried out to test whether the preference for Package B is greater tha preference for Package A? (01 I

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

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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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Save the SPSS output file (*Benefit.spv*) obtained for question 04-part A into the folder **Q 04** and close it.

A lecturer is claiming that there is an association between the gender of the student and the faculty of graduation. To assess the claim of the lecturer, a sample of 120 employees was selected and the data were collected. The collected data are presented in the data file: Survey.sav.

Fill in the blanks using appropriate percentages: (*hint: Obtain crosstabulation tables*) **(05 Marks)**

i. Percentage of female students who are studying at Commerce faculty out of total students in commerce faculty: .....

ii. Percentage of male students who are studying at Arts faculty out of total male students .....

iii. Percentage of female students who are studying at Science faculty out of total number of students: .....

iv. Percentage of total male students: .....

v. Percentage of total Commere students: .....

The lecturer now wants to test whether there is an association between the gender of the student and the faculty of graduation. What is the appropriate chart to test the association between two categorical variables in the problem? **(01 Mark)**

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c. Obtain the chart you mentioned in part (c) and interpret the results.

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

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

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f. Perform the test you mentioned in part (e) and state the statistical decision and conclusion at significance.

Statistical decision:

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Conclusion:

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Save the SPSS output file obtained for question 04-part B with the name **Survey.spv** into the

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***Instruction**

Save the folders Q 01, Q 02, Q03 and Q 04 into the folder named with your index number (MS/C

i. What type of t-test should be carried out to test whether the mean high temperature differs f
State the main assumption made in performing this test.

Test: .....

Main Assumption:

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ii. Test the validity of the assumption stated in part (i). Clearly state the hypotheses, p-valu
decisions and conclusions.

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

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iv. What is the p-value of this t test?

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