**JAIPURIA INSTITUTE OF MANAGEMENT, INDORE**

**PGDM**

**FIRST TRIMESTER (Batch 2019-21)**

**END TERM EXAMINATION, SEPTEMBER-2019**

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| --- | --- | --- | --- |
| Course Name | **Statistics for Management** | Course Code | **OM 101** |
| Max. Time | **2 hours** | Max. Marks | **40** |

**INSTRUCTIONS:**

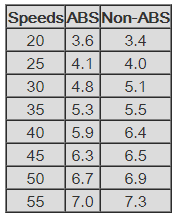
Students can use Ms-Excel data analysis tool pack in the examination.

Students should save excel file with their name and section on the desktop.

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**Questions.1 (6 Marks)**

ABS brakes pump very rapidly rather than lock, and thus they help to prevent skids. As a test, a car buyer organized an experiment. He hit the brakes and, using a stopwatch, recorded the number of seconds it took to stop an ABS-equipped car. The ABS was removed and then test was carried out on the same car again without ABS. The speeds when the brakes were applied and the number of seconds each took to stop the car on dry pavement are listed here, Analysis the data, can we infer that ABS is better?

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**Questions.2 (8 Marks)**

“Creative Media Limited (CML)” a media agency has been associated with one of its prestigious client who is engaged in manufacturing of FMCG products. Creative Media Limited has been providing promotion mix planning and support to its client for past seven years. Recently a doubt was raised about the effectiveness of promotion mix planning and so CML has gathered the following data: -

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** |
| FMCG Company’s Sales (Cr) | 12.5 | 18.0 | 22.0 | 31.0 | 8.2 | 14.5 | 28.9 |
| Advertisement Expenses (Lacs) | 7.0 | 5.0 | 11.0 | 12.0 | 8.0 | 10.0 | 12.0 |
| Event Sponsorship Expenses (Lacs) | 6.2 | 9.0 | 8.0 | 15.5 | 4.6 | 7.3 | 14.1 |

Analyze the data and comment on appropriateness of the promotion mix. Predict the sales (with 95 % confidence) if advertisement expenses are planned to be Rs. 15.0 Lacs and event sponsorship expenses are planned to be RS. 18.2 lacs in the year 2019.

**Questions.3 (14 Marks)**

Critics of television often refer to the detrimental effects that all the violence shown on television has on children. However, there may be another problem. It may be that watching television also reduces the amount of physical exercise causing weight gains. A sample of fifteen children was taken. The number of pounds each child was overweight was recorded (a negative number indicates the child is underweight). In addition, the number of hours of television viewing per week was also recorded. These data are listed here.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Television** | **42** | **34** | **25** | **35** | **37** | **38** | **31** | **33** | **19** | **29** | **38** | **28** | **29** | **36** | **18** |
| **Overweight** | **18** | **6** | **0** | **-1** | **13** | **14** | **7** | **7** | **-9** | **8** | **8** | **5** | **3** | **14** | **-7** |

a) Draw the scatter diagram.

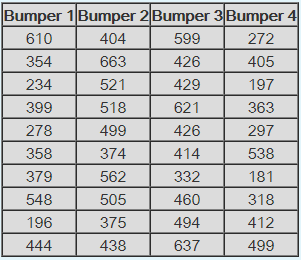
b) Calculate the sample regression line and describe what the coefficients tell you about the relationship between the two variables.

c) Is there evidence of a linear relationship between the number of hours of television viewing and how overweight the child is?

d) Predict with 90% confidence the number of pounds overweight for a child who watches 30 hours of television per week.

**Questions.4**

North American automobile manufacturers have become more concerned with quality because of foreign competition. One aspect of quality is the cost of repairing damage caused by accidents. A manufacturer is considering several new types of bumpers. To test how well they react to low-speed collisions, the manufacturer installs 10 bumpers of each of four different types on mid-sized cars, which were then driven into a wall at 5 miles per hour. The cost of repairing the damage in each case was assessed. The data are shown below.



a. Analyse the data. Is there sufficient evidence at the 5% significance level to infer that the bumpers differ in their reactions to low-speed collisions? **(6 Marks)**

b. If differences exist, which bumpers differ? **(6 Marks)**