Design of Experiments

Practical Midterm

Batch II

1. The R and D manager of an automobile company wishes to study the effect of “tyre brand” on the tread loss (in millimetre) of tyres. Four tyres from each of four different brands (A,B,C and D) are fitted to four different cars using the CRD. The data as per this design are shown in table below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Replication | **Tyre brand** | | | |
| **A** | **B** | **C** | **D** |
| 6 | 3 | 8 | 4 |
| 7 | 6 | 6 | 2 |
| 10 | 2 | 7 | 1 |
| 9 | 3 | 2 | 4 |

(a) Write the corresponding model.

(b) Check whether the tyre brand has effect on the tread loss.

(c) Perform post hoc analysis.

2. Three different group of floor laying workers (factor) and three different types of floor laying (marble, granite and tiles) are considered. The quality indices of the floor on 1-10 scale for different combinations of factor and block are shown below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Floor type (F)**  **(Block)** |  | **Worker group (G)** | | |
| **G1** | **G2** | **G3** |
| **Marble** | 8 | 9 | 5 |
| **Granite** | 9 | 6 | 10 |
| **Tile** | 6 | 7 | 8 |

(a) Write the model of the randomized complete block design.

(b) Check whether each component of the model has effect on the quality index at a significance level of 5%.