**Q. No. 2 (6)**

The engineers decide to test all five plate materials at three temperature levels, that is, 15o, 70o and 125oF. One batteries are tested at each combination of the plate material and temperature, and all are run in random order. The resulting observed battery life data are given below:

|  |  |  |  |
| --- | --- | --- | --- |
| Material Types | Temperature (Fo) | | |
| 15 | 70 | 125 |
| 1 | 130  150  138  145  152 | 134  136  174  182  177 | 170  170  104  202  204 |
| 2 |
| 3 |
| 4 |
| 5 |

Perform an appropriate statistical test to test performance of batteries at different levels of temperatures as well as different levels of materials types. Interpret your results in detail.

Answer:

**Q. No. 3 (6)**

The analysis of variance for a RCB design (Two way ANOVA) produced the ANOVA table shown below

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| S. O. V. | df | SS | MS | Fcal |
| Treatments | 3 | 28.2 |  |  |
| Blocks | 5 |  | 13.80 |  |
| Error |  | 34.1 |  |  |
| Total |  |  |  |  |

1. Complete the ANOVA table and explain this table in detail.
2. Do the data provide sufficient evidence to indicate a difference among the treatment means? Test using α = 0.01.

Answer:

**Q. No. 4 (6)**

Fit a regression model to estimate wheat production from the following. Also reply the questions given below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Fertilizer (Kg/Acre) | 100 | 200 | 400 | 500 |
| Production (Mounds/Acre | 70 | 70 | 80 | 100 |

1. Find equation of regression line and interpret your results.
2. Compute total variation, explained variation and interpret these statistics
3. Test the significance of regression coefficients and explain their meanings in your own words.
4. Estimate the yield when no fertilizer is used and estimate the yield when average fertilizer is used.

Answer:

**Question no: 5 [3+3]**

1. Take a random data of 40 observations and with the help of this data verify the properties of Normal distribution.
2. The 95% confidence interval for the mean length of life of a particular brand of light bulb is (1023.3 h, 1101.7 h). This interval is based on results from a random sample of 36 light bulbs. Find the 99% confidence interval for the mean length of life of this brand of light bulbs, assuming that the length of life is normally distributed.