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**Assignment 01**

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1. Design with 2 factors, 2 levels and 3 factors, 2 levels:

|  |  |  |  |
| --- | --- | --- | --- |
| Full Factorial | Half Factorial | Saturation | Total number of experiments |
| **22 = 4** | **4** | **4** |  |
| **32 = 9** | **9** | **9** |  |

Since: Total no of experiments =

1. We know:

Therefore,

For Cp = 1.33 and Cp = 1

Using Standard Distribution Chart (which is symmetric, hence Z= - Z) to find the expected defect rate:

|  |  |  |  |
| --- | --- | --- | --- |
| **Z** | **f(Z)** | **One sided** | **Two-sided** |
| -4 (or 4) | 0.000032 | 32 ppm | 64 ppm |
| -3 (or 3) | 0.00135 | 1350 ppm | 2700 ppm |

1. Defect rate: 5 parts/1000 tested = 0.005 (for 2-sided)

Therefore, defect rate for one-sided: **0.0025**

From Standard Distribution Chart:

|  |  |
| --- | --- |
| **f(Z)** | **Z** |
| 0.0025 | 2.81 |

Therefore,