

Course Code: MEC 309

Course Name: Quality Engineering & Management Systems

Assignment No. 2

DOA: 28-Feb-2010

DOS: 12- Mar-2010, 12 noon (For Section OE 165)

13- Mar -2010, 12 noon (For Section OE 166)

Note: Bonus marks may be given, if submission would be before time and vice versa.

Part A

- Q.1 Control charts for \bar{X} and R are maintained on certain dimensions of a manufactured part, measured in mm. The subgroup size is 4. The values of \bar{X} and R are computed for each subgroup. After 20 subgroups $\sum \bar{X} = 412.83$ $\sum R = 3.39$. Compute the values of 3 sigma limits for the \bar{X} and R charts and estimate the values of σ' on the assumption that the process is in statistical control.
- Q.2 Control charts for \bar{X} and R , σ are to be maintained on drawings from a bowl of chips the distribution of which is approximately normal. The subgroup size is 5, \bar{X}' is 60 and σ' is 18. Assume that 3 sigma control limits are to be based on \bar{X}' and σ' . Compute the value of the upper control chart limit, the control line and the lower control limit for the \bar{X} , R and σ charts respectively.
- Q.3 An item is made in lots of 200 each. The lots are given 100% inspection. The record sheet for the first 25 lots inspected showed that a total of 75 items were defective.
- Determine the trial control limits for np chart showing numbers of defectives in each lot.
 - Assume that all points fall within the control limits. What is your estimate of the process average fraction defective p' ?
 - If this p' remains unchanged, what is the probability that the 26th lot will contain exactly 7 defectives? That it will contain 7 or more defectives?

Part B

- Q.4 Define QFD and house of quality.
- Q.5 Define ISO and its importance.
- Q.6 A control chart for defects per unit u uses probability limits corresponding to probabilities of 0.975 and 0.025. The central line on the control is at $u' = 2.0$. the limits vary with the value of n . Determine the correct position of these upper and lower control limits when $n = 5$.