**Answer on Question #45528-Engineering-SolidWorks-CosmoWorks-Ansys**

A certain number of articles manufactured in a batch were classified into three categories according to some particular characteristic, being less than 50, between 50 and 60 and greater than 60. If this characteristic is known to be normally distributed, determine the mean and standard deviation for this batch if 60%, 35% and 5% were found in these categories.

Solution

Let μ be the mean (at $z = 0$) and the standard deviation of the normal curve shown below.
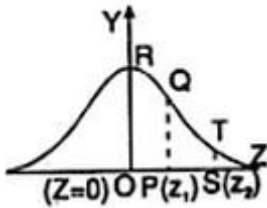
Now 60% of the articles have the characteristic below 50, 35% between 50 and 60, 5% greater than 60%.

Further the area to the left of the ordinate PQ is 60%, and that between the ordinates PQ and ST is 35% so that the areas to the left of PQ ($z = z_1$) and ST ($z = z_2$) are 0.6 and 0.95 respectively, i.e. the area $OPQR = 0.6 - 0.5 = 0.1$ and the area $OSTR = 0.45$. Thus area corresponding to $z_1 \left(\frac{50 - \mu}{\sigma} \right) = 0.1$ and the area corresponding to $z_2 \left(\frac{60 - \mu}{\sigma} \right) = 0.45$.

With the help of standard table, we have

$$\frac{50 - \mu}{\sigma} = 0.2533; \quad \frac{60 - \mu}{\sigma} = 1.645 \rightarrow \sigma = 7.543 \ and \ \mu = 48.092.$$

Answer: $\mu = 48.092$ and $\sigma = 7.543$.