

from the above calculation we see that  $N_i$  the expected no of bulbs failing each week increases up to 4th week and  $N$  decreasing upto 6th week.

The average life of a bulb =  $\sum_{i=1}^5 x_i p_i$   
 where  $x_i$  = week and  $p_i$  the probability of failure in the  $i$ th week.

$$\Rightarrow 1 \times 0.10 + 2 \times 0.15 + 3 \times 0.25 + 4 \times 0.30 + 5 \times 0.20 = \boxed{3.35}$$

Average no. of replacement (every week) =  $\frac{N}{\text{Average life}} = \frac{1000}{3.35} = \boxed{299}$

Since Average cost of weekly individual replacement policy =  $\boxed{299}$

Now we consider a case of Group replacement

End of week	Total cost of Group replacement in (Rs)	Average cost/week
1.	$1000 \times 0.25 + 100 \times 1 = 350$	$\frac{350}{1} = 350$
2.	$1000 \times 0.25 + (100 + 160) \times 1 = 510$	255
3.	$1000 \times 0.25 + (100 + 160 + 280) \times 1 = 791$	263.66

Thus the minimum cost per week is 255 if the bulb is replace from group after every two week.



And.

This cost is also  $<$  the average cost of weekly individual replacement considered.  
hence for minimum monthly cost All the bulbs should be replaced after every two weeks.