Q9 Prob. of being defective $= 0.05$

Prob. of Being functional $= 0.95$

(a) exactly 20 bulb of one defective   using Binomdist

$P(x=20) = {}^{500}C_{20} \, 0.05^{20} \times 0.95^{480}$ $\left[P(x) = {}^{n}C_{a} \, p^{n} q^{n+} \right]$

$$\boxed{P(x=20) = 0.052}$$

(b) at least 10 bulb one defective

$$P(x \geq 10) = 1 - P(x < 10) = 1 - P(x \leq 9)$$

$$P(x \geq 10) = 1 - \frac{4.6 \times 10^{-4}}{\text{↳ using calculator}}$$

$$\boxed{P(x \geq 10) = 0.99}$$

(c) at max 15 defective bulb

$$P(x > 15) = 1 - P(x \leq 15)$$

$$= 1 - 0.0198$$

$$\boxed{P(x > 15) = 0.98}$$

(d) expected no. of defective bulb in Batch of 500.

Expected no of defective bulb $= n \times$ Prob. of being defitive

$= 500 \times 0.05$

$$\boxed{n \text{ defective} = 25}$$