

$$15. P(\text{queen}) = \frac{1}{5}$$

$$P(\text{ace}) = \frac{1}{4}$$

$$P(\text{queen}) = \frac{0}{4}$$

$$= 0$$

$$16. \text{ no. of defective pens} = 12$$

$$\text{no. of good pens} = 132$$

$$\begin{aligned} \text{total no of pens} &= 12 + 132 \\ &= 144 \end{aligned}$$

$$\begin{aligned} P(\text{good pens}) &= \frac{132}{144} \\ &= \frac{11}{12} \end{aligned}$$

$$17. \text{ total bulbs} = 20$$

$$\text{no. of defective bulbs} = 4$$

$$\begin{aligned} \text{no. of non defective bulbs} &= 20 - 4 \\ &= 16 \end{aligned}$$

$$\begin{aligned} ① P(\text{defective bulb}) &= \frac{4}{20} \\ &= \frac{1}{5} \end{aligned}$$

$$\text{no. of remaining bulbs} = 19$$

$$P(\text{non defective bulbs}) = \frac{15}{19}$$