1) Two biased coins are tossed 126 times. HH = 36, TT = 44.

HT = 16, TH = 30.

To find = $P(C2 = T \mid C1 = H)$. [Conditional Probability]

$$\therefore P(C2=T \mid C1=H) = \frac{P(HT)}{P(C1=H)} = \frac{16/126}{(36+16)/126}$$

$$= \frac{16}{36+16} = \frac{16}{52} = \frac{8}{26} = \frac{4}{13}$$

$= 0.30769$

$= 0.308.$

$\therefore$ option (A)

2) Test = +ve | Battery reject

Test = -ve | Battery accepted.

Let X ~~be~~ and Y be the events that the battery is defective and non defective.

A be the event if test is +ve, (rejected)

B be the " " " " -ve. (acc)

$$P(X) = \frac{2.27}{100}, \quad P(Y) = \frac{93.73}{100}.$$

$$\cancel{P(A|X) =} \quad P(B|Y) = \frac{91.74}{100}, \cancel{P(A|Y)}$$

$$P(B|X) = \frac{3.19}{100}, \quad P(A|Y) = \frac{8.26}{100}$$

To find $= P(Y|A)$

$$P(A|X) = \frac{96.81}{100}.$$

$$P(Y|A) = \frac{P(A|Y)\cdot P(Y)}{P(A|Y)\cdot P(Y) + P(A|X)\cdot P(X)}$$ (Baye's Theorem).

$$= \frac{8.26 \times 93.73}{8.26 \times 93.73 + 96.81 \times 2.27}$$

3) HH = 50, TT = 39, HT = 25, TH = 30.

Marginal probabilities:

C1H = (50 + 25) / 144 = 0.521

C1T = (39 + 30) / 144 = 0.479

C2H = (50 + 30) / 144 = 0.555.

C2T = (39 + 25) / 144 = 0.444

∴ option (A).

5).

$n = 24.$

$\bar{X} = \text{mean} = 450.3°C.$

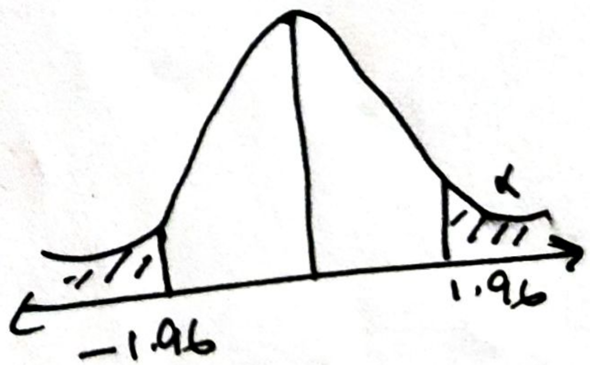
$\mu = 450°C.$

$\sigma = \text{Variance} = 1.0.$

$$Z = \left| \frac{\bar{X} - \mu}{\sigma/\sqrt{n}} \right| = \left| \frac{0.3}{1 \cdot \sqrt{24}} \right| = \frac{0.3}{2\sqrt{6}}.$$

$= 0.06123$

$\alpha = 0.05$ (critical value)



$\therefore 0.06123 < 1.96$

$\therefore$ Accepted null hypothesis.