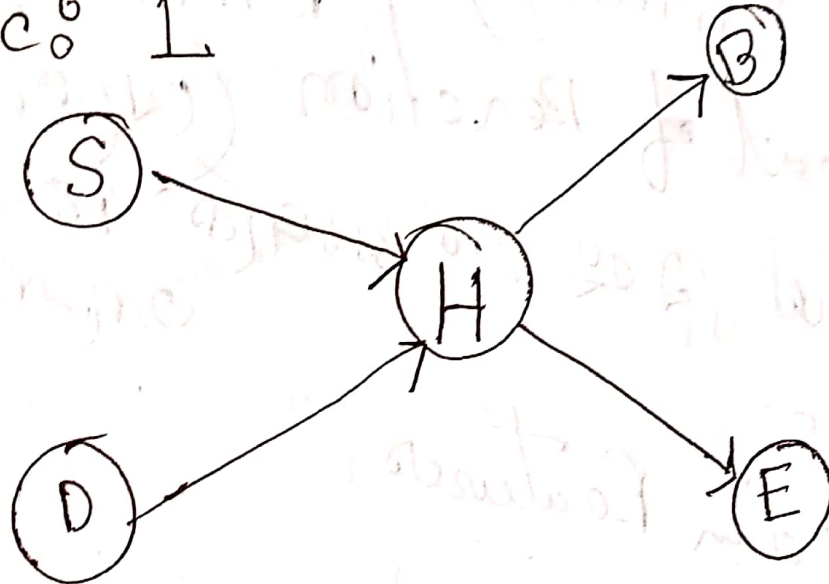


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Here, $P(S) = 0.3$

$$P(H|S \cap D) = 0.8$$

$$P(D) = 0.4$$

$$P(H|\neg S \cap D) = 0.5$$

$$P(H|S \cap \neg D) = 0.4$$

$$P(H|\neg S \cap \neg D) = 0.1$$

$$P(B|H) = 0.7$$

$$P(\bar{E} | \bar{H}) = 0.1 \quad P(E | H) = 0.8$$

$$P(E | \bar{H}) = 0.1$$

(1) Probability of the heart disease $P(H)$

$$= P(H | S \cap D) P(S \cap D) + P(H | \bar{S} \cap D) P(\bar{S} \cap D) \\ + P(H | S \cap \bar{D}) P(S \cap \bar{D}) + P(H | \bar{S} \cap \bar{D}) P(\bar{S} \cap \bar{D})$$

Now, $P(S \cap D) = P(S) \times P(D) = 0.3 \times 0.4 = 0.12$

$$P(\bar{S} \cap D) = P(\bar{S}) \cap P(D) \\ = (1 - P(S)) \times P(D) \\ = (1 - 0.3) \times 0.4$$

$$P(S \cap \bar{D}) = 0.7 \times 0.4 = 0.28$$

$$= P(S) \cap P(\bar{D}) \\ = P(S) \times (1 - P(D)) \\ = 0.3 \times (1 - 0.4)$$

$$= 0.18$$

$$\therefore P(\bar{S} \cap \bar{D}) = P(\bar{S}) \times P(\bar{D}) = 0.7 \times 0.6 = 0.42$$

Using the values we get,

$$P(H) = (0.8 \times 0.12) + (0.5 \times 0.28) + (0.4 \times 0.18) + (0.1 \times 0.42)$$

$$= 0.096 + 0.140 + 0.072 + 0.042$$

$$= 0.35$$

The probability of getting a heart disease is 0.35.

(Ans)