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(1)

Q3. sample size is a statistic
C.

Q4. ~~8~~ ~~8~~ ~~4~~ ~~1~~ ~~8~~ ~~4~~
4 4 5 6 8 9

5 6

$$\frac{5+6}{2} = 5.5$$

Q9. TERRESTRIAL

T 2

E 2

R 3

S 1

I 1

A 1

L 1

$$\frac{11!}{2! \times 2! \times 3!}$$

$$= 1663200$$

Q10.

$$\begin{aligned} \# \text{ possible lottery} &= {}^{20}C_6 \\ &= 38760 \end{aligned}$$

$$Q11 - P(R) = 0.19$$

$$P(C) = 0.32$$

$$P(C \cap R) = 0.13$$

$$* P(R \cup C) = P(R) + P(C) - P(C \cap R)$$

$$P(R \cup C) = 0.19 + 0.32 - 0.13$$

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Q12 $P(A) = 0.48$ $P(B) = 0.35$

$$P(A \cup B) = 0.662 \quad P(A) \times P(B) = 0.168$$

$$0.662 = 0.48 + 0.35 - P(A \cap B)$$

$$P(A \cap B) = 0.168$$

\therefore independent

$$P(A \cap B) \neq 0 \quad \therefore \text{not mutually exclusive}$$

\rightarrow Q13. $P(A|B) = 0.25$
 $P(B|A) = 0.50$
 $P(A \cup B) = 1$

$$P(B|A) = \frac{P(A \cap B)}{P(A)}$$

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

$$P(A|B) = \frac{P(B|A) \cdot P(A)}{P(B)}$$

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$P(A) + P(B) - P(A \cup B) = P(A \cap B)$$

$$P(A|B) = \frac{P(A) + P(B) - P(A \cup B)}{P(B)}$$

$$0.25 = \frac{0.5 \times P(A)}{P(B)}$$

$$P(B) \cdot 0.5 = P(A) \quad 2 \cdot P(A) = P(B)$$

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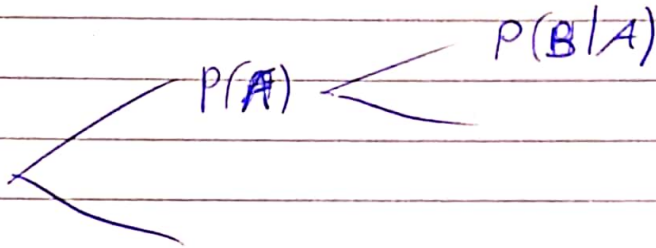
Q14.

~~Q15.~~

$$0.1 \times 0.95 + 0.9 \times 0.2$$

$$= 0.275$$

Q15.

 $P(F)$
 A $P(H)$
 B $P(A|B)?$ 

$$P(A|B) = \frac{P(B|A) \cdot P(A)}{P(B)}$$

$\overset{0.9 \checkmark}{P(B|A)} \quad \overset{0.2 \checkmark}{P(A)} \quad \overset{0.3}{P(B)}$

$$P(B) = 0.18 + \cancel{0.12} 0.12$$

$$= \frac{0.9 \times 0.2}{0.3}$$

Q16. $E(x) = \sum p \times x$

$$E(x) = (0.2)(-2)$$

$$+ (0.1)(-1)$$

$$+ (0.1)(0)$$

$$+ (0.2)(1)$$

$$+ (0.4)(2)$$

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$$\begin{aligned} \text{Q17} \quad \text{Var}(X) &= E(X^2) - E(X)^2 \\ &= 1.1 - (0.3)^2 \\ &= 1.01 \end{aligned}$$

$$E(X^2) = 1.1$$

$$\begin{aligned} \text{Q18.} \quad X &\sim \text{Binomial}(8, \cancel{0.25}) 0.54 \\ P(X=3) \end{aligned} \quad \begin{matrix} n=8 \\ x=3 \end{matrix}$$

$$P(X=x) = \binom{n}{x} p^x (1-p)^{n-x}$$

$$\begin{aligned} &= \binom{8}{3} (0.54)^3 (1-0.54)^5 \\ &= 0.182 \end{aligned}$$

$$\begin{aligned} \text{Q19.} \quad \lambda_6 &= 1 & 6 \text{ months} \\ \lambda_{12} &= 2 & 12 \text{ month} \end{aligned}$$

$$P(X=2) = \frac{e^{-\lambda} \cdot \lambda^x}{x!}$$

$$\begin{aligned} &= \frac{e^{-2} \cdot 2^2}{2!} \\ &= 0.27067 \end{aligned}$$

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Q20. $X \sim N(31.45, 5.29^2)$

$$P(X < 36.74)$$

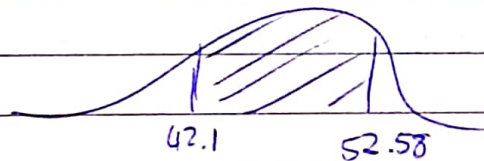
$$= P\left(\frac{X - 31.45}{5.29} < \frac{36.74 - 31.45}{5.29}\right)$$

$$= P(Z < 1)$$

$$= 0.8413$$

Q21. $X \sim N(47.34, 5.24^2)$

$$P(42.1 < X < 52.58)$$



$$P(X < 52.58) - P(X < 42.1)$$

$$= P\left(\frac{X - 47.34}{5.24} < \frac{52.58 - 47.34}{5.24}\right) - P\left(\frac{X - 47.34}{5.24} < \frac{42.1 - 47.34}{5.24}\right)$$

$$= P(Z < 1) - P(Z < -1)$$

$$= 0.8413 - 0.2420$$

$$= 0.5993$$

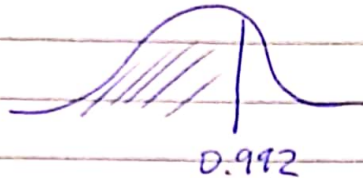
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Q22

$$X \sim N(45.64, 12.54^2)$$

$$P(X < q) = 0.992$$



$$P\left(\frac{X - 45.64}{12.54} < \frac{q - 45.64}{12.54}\right) = 0.992$$

$$P(Z < 2.41)$$

$$2.41 = \frac{q - 45.64}{12.54}$$

$$q = 75.8614$$

Q23.

$$\hat{p} \pm 1.96 \sqrt{\frac{p(1-p)}{n}}$$

$$\hat{p} = 0.03$$

$$p = \frac{1}{2}$$

$$n = \frac{1.96^2}{0.03 \times 0.03}$$

$$n = \frac{1.96^2}{4 \times 0.03^2}$$

$$n = 1067.1$$

$$n = 1068$$

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* Q24. $n = 79$

20 passed first attempt

Ans = ~~0.336~~
~~0.3336~~
0.349

H_0 : normal

Q28 $df = 8$