

Q1

$$(i) \frac{3099.2}{40} - \left[\frac{\sum(X-6)}{40} \right]^2 = 3.2^2$$

$$\frac{\sum(X-6)}{40} = 8.2$$

$$\sum(X-6) = 328$$

$$(ii) \sum(X-50) = 328$$

$$\sum X - 40 \times 50 = 328$$

$$\sum X = 2328$$

$$\bar{X} = \frac{2328}{40} = 58.2$$

Q2

$$(i) P(X > 0) = 0.25$$

$$P\left(Z > \frac{3}{\sigma}\right) = 0.25$$

$$P\left(Z < \frac{3}{\sigma}\right) = 0.75$$

$$\frac{3}{\sigma} = 0.674$$

$$\sigma = 4.45$$

$$(ii) X \sim B(8, 0.25)$$

$$P(X < 2) = P(X = 0, 1)$$

$$= 0.75^8 + 0.861 \times 0.75^7 \times 0.25$$

$$= 0.367$$

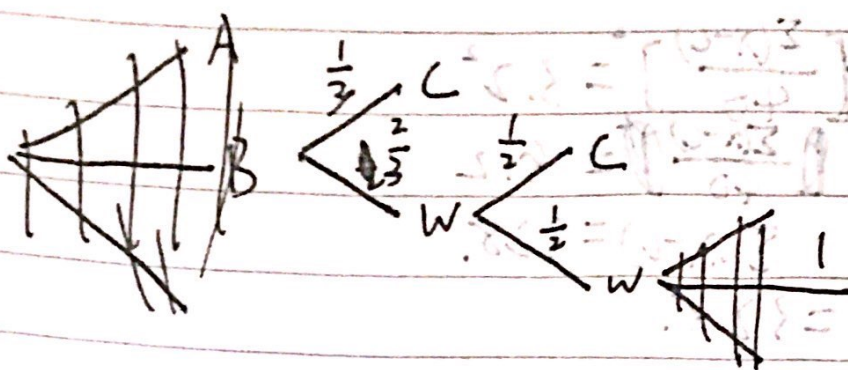


No.

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Q3.

(i)



(ii) ~~X=1~~ $P(X=1) = \frac{1}{3}$

~~X~~ $P(X=2) = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$ $\frac{2}{3} \times \frac{1}{2} = \frac{1}{3}$

$P(X=3) = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$ $\frac{2}{3} \times \frac{1}{2} \times 1 = \frac{1}{3}$

X	1	2	3
$P(X=x)$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$

$E(X) = 1 \times \frac{1}{3} + 2 \times \frac{1}{3} + 3 \times \frac{1}{3} = 2$

~~Q4~~

Q4 (i) ~~5P5~~

(i) $5P5 \times 4P4 \times 3P3 = 720$

(ii) ~~2P2 \times 2P2 \times 2P2 = 56~~ $2P2 \times 2P2 \times 4P4 =$

~~3P3 \times 2P2 \times 2P2 = 80~~ $2P2 \times 2P2 \times 5P5 = 60$

(iii) $1 + 7 + 7 \times 7 = 57$



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Q5.

$$(i) 1 \div \frac{1}{3} = 3$$

$$(ii) P(X > 8) = \frac{1}{3} \left(1 - \frac{1}{3}\right)^{9-1}$$

$$= 0.013$$

$$(iii) P(X < n) = 0.99.$$

$$1 - \left(\frac{2}{3}\right)^{n-1} > 0.99.$$

$$\left(\frac{2}{3}\right)^{n-1} < 0.01$$

$$n-1 > 11.36$$

$$n > 12.36$$

$$\therefore n = 13$$

Q6.

$$(ii) 28$$

$$(iii) 36$$

$$(iv) 5 \times 16 + 15 \times 34 + 25 \times 56 + 40 \times 40 + 60 \times 30 + 80 \times 24$$

$$= 36.55$$



Q7.

$$(i) X \sim B(6, 0.35)$$

$$\begin{aligned} P(X > 3) &= P(X = 4, 5, 6) \\ &= {}^6C_4 \times 0.35^4 \times 0.65^2 + {}^6C_5 \times 0.35^5 \times 0.65 \\ &\quad + 0.35^6 \\ &= 0.117 \end{aligned}$$

$$ii) P(X > 1) > 0.95$$

$$P(X = 0) \leq 0.05$$

$$0.65^n < 0.05$$

$$n > \frac{\ln 0.05}{\ln 0.65}$$

$$n > 6.95$$

$$\therefore n = 7$$

$$iii) \mu = 100 \times 0.35 = 35$$

$$\sigma^2 = 35 \times 0.65 = 22.75$$

$$\therefore X \sim N(35, 22.75)$$

$$P(X > 39) = P\left(Z > \frac{39 - 35}{\sqrt{22.75}}\right)$$

$$= P(Z > 0.9435)$$

$$= 1 - P(Z < 0.9435)$$

$$= 1 - 0.8272$$

$$= 0.1728$$

