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1) A) 88 – 100
B) 60 – 88
C) 25 – 60
D) 8 – 25
E) 0 – 8

$\mu = 72$ $\sigma = 8.1$

$$\frac{x-72}{8.1} = \frac{1}{\sqrt{2\pi}}\int_{-\infty}^{x} e^{-y^2/2}\,dy$$

$A = \frac{x-72}{8.1} = 1.17$

$x - 72 = 1.17 \times 8.1 + 72$

$= 81.47 - 100$

$B = \left(\frac{x-72}{8.1} = 0.26\right) = 74.1 - 81.47$

$C) \left(\frac{x-72}{8.1} > \right) = 72$

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2) $X_i = \frac{1}{\lambda} e^{-\lambda t}$

$= \frac{1}{4} e^{-\frac{1}{4}t}$

$\mu = \frac{1}{\lambda} = 4$

$\sigma^2 = \frac{1}{\lambda^2} = 16$

$E(\Sigma Y_i) = E(\Sigma X_i - \Sigma X_i^2)$

$\sigma_i^2 = \underline{E(X_i)^2 - (E X_i^2)}$

$\Rightarrow 16 - 16 = 0$

$E(Y_i) = 4 - 0$

$= 4$

$E(Y_i^2) = E(X_i^2 - 2X_i^3 + X_i^4)$

$= 0 - 2E(X_i^3) + E(X_i^4)$

$\cancel{E(X_i^3) = \int_{-\infty}^{\infty} \frac{t^3 e^{-\lambda t^3}}{\lambda} dt}$

$E(Y_i)^2 = 0$

$\sigma^2 = 16$

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Using CLT

$$P\left(\frac{\sum_{i=1}^{n} X_i - n\mu}{\sqrt{n\sigma^2}} \geq \frac{40 - n\mu}{\sqrt{n\sigma^2}}\right) = 1 - \phi\left(\frac{40 - n\mu}{\sqrt{n\sigma^2}}\right)$$

~~where~~ $\cancel{\Sigma} \cancel{= P\left(\sum_{i=1}^{40} Y_i\right)}$

$$\Rightarrow P\left(\frac{\sum_{i=1}^{n} X_i - 40\times4}{\sqrt{40\times16}}\right) = 1 - \phi\left(\frac{40 - 160}{\cancel{8}\times\sqrt{\cancel{40}10}}\right)$$

$$= 1 - \phi\left(\frac{-\cancel{120}\,15}{8\sqrt{10}}\right)$$

$$= 1 - \phi\left(-\sqrt{\frac{\cancel{225}\,45}{\cancel{10}\,2}}\right)$$

$\Rightarrow$