STA237, TUT3 Answers

Q2] $n = 20$

$p = P(\text{survive}) = 1 - 0.2 = 0.8$

Let X be the number of survive

$X \sim Bin(20, 0.8)$

(a) $P(X = 14)$

$= P(X \leq 14) - P(X \leq 13)$

$= 0.196 - 0.087$

$= 0.109$

(b) $P(X \geq 10)$

$= 1 - P(X \leq 9)$

$= 1 - 0.001$

$= 0.999$

(c) $P(X \leq 16)$

$= 0.589$

(d) $E(X) = np = 20 \times 0.8$

$= 16$

$V(X) = np(1-p) = 20 \times 0.8 \times 0.2$

$= 3.2$

Q3] Let Y be the number of arrivals

$Y \sim Poi(7)$

(a) $P(Y \leq 3)$

$= 0.082$

(b) $P(Y \geq 2)$

$= 1 - P(Y \leq 1)$

$= 1 - 0.007$

$= 0.993$

(c) $P(Y = 5)$

$= P(Y \leq 5) - P(Y \leq 4)$

$= 0.391 - 0.173$

$= 0.128 //$