19. Solution: B
Apply Bayes’ Formula. Let
\( A = \text{Event of an accident} \)
\( B_1 = \text{Event the driver’s age is in the range 16-20} \)
\( B_2 = \text{Event the driver’s age is in the range 21-30} \)
\( B_3 = \text{Event the driver’s age is in the range 30-65} \)
\( B_4 = \text{Event the driver’s age is in the range 66-99} \)
Then
\[
\Pr(B_i | A) = \frac{\Pr(A | B_i) \Pr(B_i)}{\Pr(A | B_1) \Pr(B_1) + \Pr(A | B_2) \Pr(B_2) + \Pr(A | B_3) \Pr(B_3) + \Pr(A | B_4) \Pr(B_4)}
\]
\[
= \frac{(0.06)(0.08)}{(0.06)(0.08) + (0.03)(0.15) + (0.02)(0.49) + (0.04)(0.28)} = 0.1584
\]

20. Solution: D
Let
\( S = \text{Event of a standard policy} \)
\( F = \text{Event of a preferred policy} \)
\( U = \text{Event of an ultra-preferred policy} \)
\( D = \text{Event that a policyholder dies} \)
Then
\[
\]
\[
= \frac{(0.001)(0.10)}{(0.01)(0.50) + (0.005)(0.40) + (0.001)(0.10)} = 0.0141
\]

21. Solution: B
Apply Baye’s Formula:
\[
\Pr(\text{Seri. Surv.} | \text{Surv.}) = \frac{\Pr(\text{Surv.} | \text{Seri.}) \Pr(\text{Seri.})}{\Pr(\text{Surv.} | \text{Crit.}) \Pr(\text{Crit.}) + \Pr(\text{Surv.} | \text{Seri.}) \Pr(\text{Seri.}) + \Pr(\text{Surv.} | \text{Stab.}) \Pr(\text{Stab.})}
\]
\[
= \frac{(0.9)(0.3)}{(0.6)(0.1) + (0.9)(0.3) + (0.99)(0.6)} = 0.29
\]