

98. Let X_1, X_2, X_3 be a random sample from a discrete distribution with probability function

$$p(x) = \begin{cases} \frac{1}{3} & \text{for } x = 0 \\ \frac{2}{3} & \text{for } x = 1 \\ 0 & \text{otherwise} \end{cases}$$

Determine the moment generating function, $M(t)$, of $Y = X_1X_2X_3$.

- (A) $\frac{19}{27} + \frac{8}{27}e^t$
- (B) $1 + 2e^t$
- (C) $\left(\frac{1}{3} + \frac{2}{3}e^t\right)^3$
- (D) $\frac{1}{27} + \frac{8}{27}e^{3t}$
- (E) $\frac{1}{3} + \frac{2}{3}e^{3t}$