

98. Solution: A

Let  $g(y)$  be the probability function for  $Y = X_1X_2X_3$ . Note that  $Y = 1$  if and only if  $X_1 = X_2 = X_3 = 1$ . Otherwise,  $Y = 0$ . Since  $P[Y = 1] = P[X_1 = 1 \cap X_2 = 1 \cap X_3 = 1] = P[X_1 = 1] P[X_2 = 1] P[X_3 = 1] = (2/3)^3 = 8/27$ .

$$\text{We conclude that } g(y) = \begin{cases} \frac{19}{27} & \text{for } y = 0 \\ \frac{8}{27} & \text{for } y = 1 \\ 0 & \text{otherwise} \end{cases}$$

$$\text{and } M(t) = E[e^{yt}] = \frac{19}{27} + \frac{8}{27}e^t$$