Example 14 If A, B, C are three mutually exclusive and exhaustive events of an experiment such that

$3P(A) = 2P(B) = P(C)$, then $P(A)$ is equal to

(A) $\frac{1}{11}$ (B) $\frac{2}{11}$ (C) $\frac{5}{11}$ (D) $\frac{6}{11}$

Solution (B) is the correct answer. Let $3P(A) = 2P(B) = P(C) = p$ which gives $p(A) = \frac{p}{3}$, $P(B) = \frac{p}{2}$ and $P(C) = p$

Now since A, B, C are mutually exclusive and exhaustive events, we have

$$P(A) + P(B) + P(C) = 1$$

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$$\Rightarrow \qquad \frac{p}{3} + \frac{p}{2} + p = 1 \qquad \Rightarrow \qquad p = \frac{6}{11}$$

Hence, $P(A) = \frac{p}{3} = \frac{2}{11}$