Suppose an experiment has an infinite sample space $S = \{a_1, a_2, a_3, \dots\}$ where $P(a_k) = 2^{-k}$ for each $k = 1, 2, 3, \dots$. For each k, define the infinite event $E_k = \{a_k, a_{k+1}, a_{k+2}, \dots\}$. What is the probability that the events E_2 and E_4^c both occur?

(a) 3/8

(b) 5/8

(c) 1/2

(d) 1/8

(e) 1/4

(f) 3/4

(g) 1/16

(h) 3/16

(i) 0

(j) 5/16

(k) 2/3

(l) None of these