7. The value of 'a' for which one root of the quadratic equation $(a^2-5a+3)\,x^2+(3a-1)x+2=0$ is twice as large as the other, is (2003)

1) $\frac{2}{3}$ 2) $-\frac{2}{3}$ 3) $\frac{1}{3}$ 4) $-\frac{1}{3}$

Ans.

(1) $\beta = 2\alpha$

$$3\alpha = \frac{3a-1}{a^2-5a+3}$$

$$2\alpha^2 = \frac{2}{a^2-5a+3}$$

$$\frac{(3a-1)^2}{a(a^2-5a+3)^2} = \frac{1}{a^2+5a+3} \Rightarrow a = \frac{2}{3}.$$