

19. You are given:

(i) A sample x_1, x_2, \dots, x_{10} is drawn from a distribution with probability density function:

$$\frac{1}{2} \left[\frac{1}{\theta} \exp\left(-\frac{x}{\theta}\right) + \frac{1}{\sigma} \exp\left(-\frac{x}{\sigma}\right) \right], \quad 0 < x < \infty$$

(ii) $\theta > \sigma$

(iii) $\sum x_i = 150$ and $\sum x_i^2 = 5000$

Estimate θ by matching the first two sample moments to the corresponding population quantities.

(A) 9

(B) 10

(C) 15

(D) 20

(E) 21