138. **Key**: D

Suppose the component represented by the random variable X fails last. This is represented by the triangle with vertices at (0, 0), (10, 0) and (5, 5). Because the density is uniform over this region, the mean value of X and thus the expected operational time of the machine is 5. By symmetry, if the component represented by the random variable Y fails last, the expected operational time of the machine is also 5. Thus, the unconditional expected operational time of the machine must be 5 as well.