Which of the following approximations are made in treating a conjugated dye molecule as a particle in a box? (Mark all that are correct)

a. The conjugated portion of the molecule is treated as a one-dimensional space in which the pi electrons are localized.
b. The potential energy of the pi electrons is assumed to be constant at all points along the conjugated chain.
c. The potential energy is assumed to be infinite near the ends of the conjugated chain.
d. The potential energy of the pi electrons is treated as a sinusoidally-varying function with minima at each nucleus along the conjugated chain.
e. The potential energy is assumed to undergo a parabolic increase as the ends of the conjugated chain are reached.