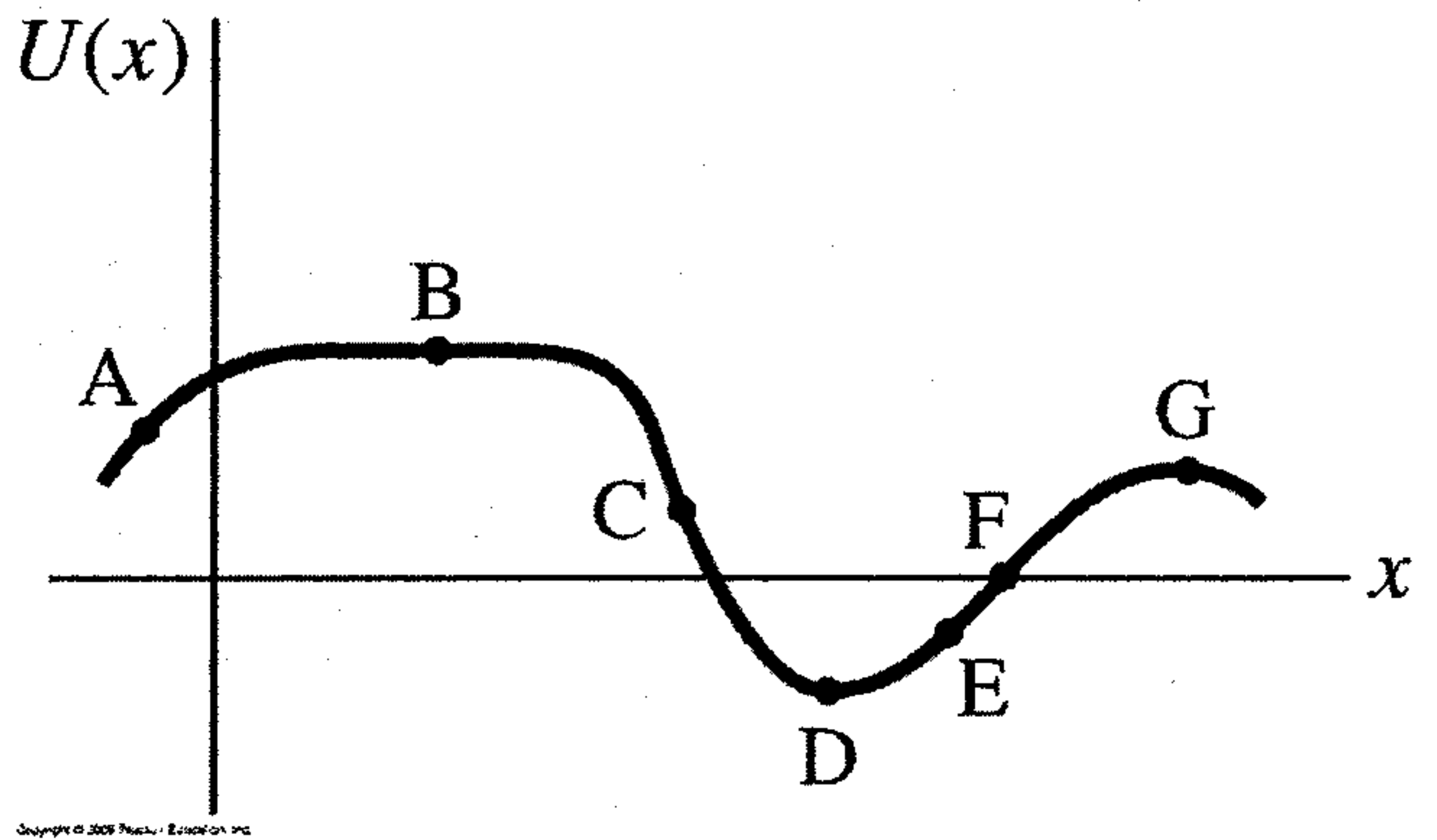


C 19. At which of the labeled points on the potential curve shown on the right does the force on the system have its maximum positive value?

- a) A b) B  C d) D e) E



1476

$$F = - \frac{dU}{dx}$$

So place with largest negative slope, C

e 20. A 15 kg cannonball is fired at a 35 degree angle above the horizontal from the top of a 300 m tall building, at a speed of 120 m/s. What will be its speed (in m/s) when it hits the ground? Use energy conservation.

- a) 77 b) 132 c) 420 d) 170  e) 142

4926

$$E_i = mgh + \frac{1}{2} m v_0^2$$

$$E_f = \frac{1}{2} m v_f^2$$

$$E_i = E_f$$

$$\frac{1}{2} m v_f^2 = \frac{1}{2} m v_0^2 + mgh$$

$$= 108,000 \text{ J} + 44,000 \text{ J} = 152,000 \text{ J}$$

$$v_f = \sqrt{\frac{2(152,000 \text{ J})}{15 \text{ kg}}} = 142 \text{ m/s}$$