

1. A porter lifts a heavy suitcase of mass 80 kg and at the destination lowers it down by a distance of 80 cm with a constant velocity. Calculate the work done by the porter in lowering the suitcase. (take $g = 9.8 \text{ ms}^{-2}$)

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(a) -62720.0 J

(b) -627.2 J

(c) $+627.2 \text{ J}$

(d) 784.0 J

Ans

(b) From work-energy theorem,

$$W_{\text{Porter}} + W_{\text{mg}} = \Delta \text{K.E.} = 0 \quad (\because \text{velocity constant})$$

$$\text{or, } W_{\text{Porter}} = -W_{\text{mg}} = -mgh$$

$$\therefore W_{\text{Porter}} = -80 \times 9.8 \times \frac{80}{100} = -627.2 \text{ J}$$