5.** A uniform chain of length L and mass M is lying on a smooth table and one third of its length is hanging vertically down over the edge of the table. If g is acceleration due to gravity, the work required to pull the hanging part on to the table is **[1985 - 2 Marks]

(a) MgL (b) $MgL/3$ (c) $MgL/9$ (d) $MgL/18$

Ans

(d) The work done in bringing the mass up will be equal to the change in potential energy of the mass.
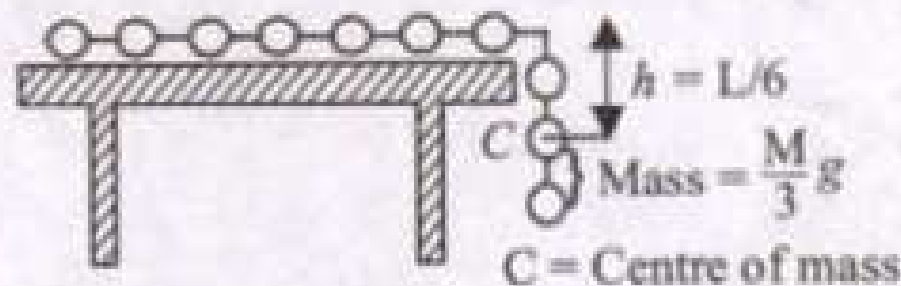
i.e., W = Change in potential energy

$$= mgh = \frac{M}{3} \times g \times \frac{L}{6} = \frac{MgL}{18}$$