B.Tech (4 years)/B.Tech & M.Tech- Dual Degree/B.Tech & MBA- Dual Degree

PHYSICS

1. The dimensions of entropy are

   (A) $M^0L^{-1}T^0K$ (B) $M^0L^{-2}T^0K^2$ (C) $MLT^{-2}K$ (D) $ML^2T^{-2}K^{-1}$

2. In a vernier calipers, p divisions of its main scale match with (p+1) divisions on its vernier scale. Each division of the main scale is k units. Using the vernier principle, its least count will be

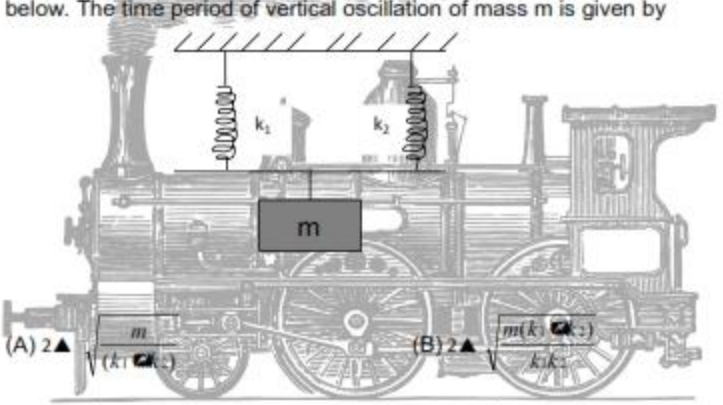
   (A) k ➡ (1/p) (B) (k+1)/p (C) (p+1)/k (D) k/(p+1)

3. The torque of a force $\vec{F} = \vec{i} - 5\vec{j} - 8\vec{k}$ acting at a point $\vec{r} = 7\vec{i} + \vec{j} + 3\vec{k}$ is

   (A) $\vec{i} - 24\vec{j} + 34\vec{k}$ (B) $18\vec{i} + 24\vec{j} - 34\vec{k}$

   (C) $15\vec{i} - 24\vec{j} + 34\vec{k}$ (D) $5\vec{i} - \vec{j} + 34\vec{k}$

4. Two springs of force constants k_1 and k_2 are connected as shown in figure below. The time period of vertical oscillation of mass m is given by



   (A) $2\pi\sqrt{\frac{m}{(k_1 + k_2)}}$ (B) $2\pi\sqrt{\frac{m(k_1 + k_2)}{k_1 k_2}}$

   (C) $2\pi\sqrt{\frac{m(k_1 + k_2)}{k_1 k_2}}$ (D) $2\pi\sqrt{\frac{m}{(k_1 + k_2)}}$

SPACE FOR ROUGH WORK