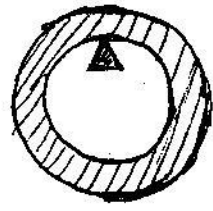
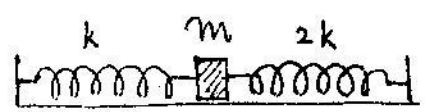


5. A simple pendulum oscillates with a small amplitude  $\theta_0$ . The maximum tension in the string of the simple pendulum is
- (A)  $mg$
  - (B)  $mg(1 + \frac{1}{2}\theta_0^2)$
  - (C)  $mg(1 + \theta_0^2)$
  - (D)  $mg(1 + 2\theta_0^2)$
6. A circular ring is suspended from a knife edge as shown in the figure. The ring weighs 200g, its outer radius is 15cm and the inner radius is 10cm. The period of small oscillations is given by



- (A) 0.82 sec
- (B) 0.92 sec
- (C) 1.05 sec
- (D) 1.25 sec

7. A block of mass  $m$  rests on a horizontal table and is connected to two fixed posts by springs having spring constant  $k$  and  $2k$ . If the block is displaced from the its equilibrium position, the angular frequency of vibrations is given by



- (A)  $\sqrt{\frac{3k}{m}}$
- (B)  $\sqrt{\frac{k}{m}}$
- (C)  $\sqrt{\frac{k}{3m}}$
- (D)  $\sqrt{\frac{3k}{2m}}$

8. Two electrons are ejected in opposite directions from radioactive atoms in a sample of radioactive material. Each electron has a speed of  $0.67c$  as measured by an observer in the laboratory. Their relative velocity is given by

- (A)  $1.34c$
- (B)  $1.19c$
- (C)  $0.92c$
- (D)  $0.87c$