



- (b) A hoop of mass 10 kg and radius 60cm rolls along the ground at the rate of 12 m/s. Calculate its kinetic energy in ergs. **6**

**OR**

- (b) A sphere of mass 50gm and of diameter 2cm rolls without slipping with a velocity of 5cmpersec. Calculate its total kinetic energy. **6**

- 3 (a) Explain damped harmonic motion in an electrical circuit **8**

**OR**

- (a) What is a damped vibration?, Explain quality factor. **8**  
(b) In the oscillatory circuit  $L=0.2$  Henry,  $C=0.0012 \mu f$ . **6**  
what is the maximum value of resistance for the circuit to be oscillatory?

**OR**

- (b) Find time for amplitude to become half in case of damped oscillations. **6**

- 4 (a) What do you mean by nodes and antinodes in a column? Explain. **8**

**OR**

- (a) Derive the expression for velocity of transverse waves along a stretched string. **8**  
(b) If the frequency of a tuning fork is 400 and the velocity of sound in air is 320 m/s, find how far sound travels while the fork completes 30 vibrations. **6**

**OR**

- (b) Explain beat. **6**