16 **A mass is connected to a spring and it vibrates up and down, forming a simple harmonic system. Which of the following are correct?**

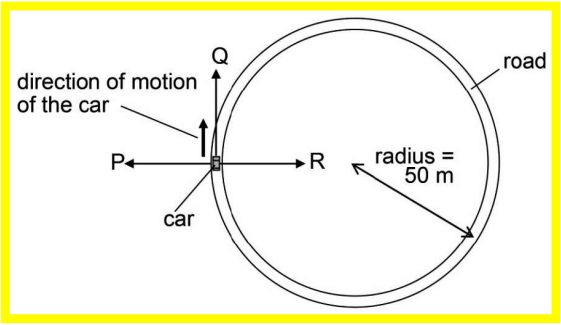
1. **The kinetic energy of the mass is at a maximum half way up.**
2. **The potential energy of the system is at a maximum at the top of the mass's motion.**
3. **The potential energy of the system is at a maximum at the bottom of the mass's motion.**

A 1 only
B 2 only
C 3 only
D 1 and 2 only
E 1, 2 and 3

17 **A satellite moving in a circular orbit with respect to the Earth's centre experiences a gravitational force. If the satellite is put into a new circular orbit of smaller radius, how will the gravitational force and the speed of the satellite change, if at all?**

A The gravitational force and the speed increase
B The gravitational force increases and the speed remains constant
C The gravitational force and the speed are unchanged
D The speed remains constant and the gravitational force decreases
E The gravitational force and the speed decrease

18 **The diagram shows a car of mass 1000 kg travelling at a constant speed of 30 m/s in the direction shown along a flat, level road which forms a circle of radius 50 m.**



Which row in the table gives both the magnitude of the resultant force on the car and the direction of the acceleration of the car at the instant shown?

row	magnitude of resultant force (kN)	direction of acceleration
1	0	R
2	18	Q
3	18	R
4	30	Q
5	30	P

A row 1 B row 2 C row 3 D row 4 E row 5

