1. Discuss in detail with necessary sketches the advanced technological innovations employed in automotive brake systems for attaining higher braking efficiency.

2. A motor vehicle with wheel base of 2.64 m and weighing 12500 N has its CG 1.24 m behind the front axle, and 0.8 m above ground level. The vehicle is fitted with brakes on all four wheels and the coefficient of adhesion between tyres and road is 0.6. If the vehicle is climbing down at an inclination of 1 in 25, determine the load distribution between the front and rear wheels and also the distance at which it can be brought to rest from a speed of 60 km/h when
   i. Only rear wheel brakes are applied
   ii. Only front wheel brakes are applied, and
   iii. All four wheel brakes are applied.

3. A motor cycle has wheel base 1.72 m apart. The centre of gravity of the cycle and rider is 0.64 m above ground level and 0.8 m in front of the rear axle. The coefficient of friction between the tyres and the road is 0.72. If the rear wheel is braked, find the greatest deceleration that can be obtained.
   i. If the cycle is moving in a straight path.
   ii. If it is going round a curve of 42 m radius at 56 km/h.