

2/9 A lorry accelerates uniformly from 34 km/h to 60 km/h in 5 seconds. Find the acceleration and the distance travelled during this acceleration. Plot a velocity – time graph representing this situation. (2 points)

3/9 A railway car of mass 2500 kg, moving at a velocity of 4 m/s, collides with and sticks to a stationary identical car. What is the resultant velocity? (2 points)

4/9 A sledge of mass 200kg, with a man of mass 80kg riding on it, it is pulled by six dogs across the snow, with each dog exerting a force of 20N. If the sledge starts from rest, what will be its kinetic energy and velocity after it has moved 15m. (2 points)

5/9 What is the moment produced by spanner if the force of 12N at an angle of 80° is applied and a length of a spanner is 35cm? (2 points)

7/10 The planet Zargon has a gravitational field strength of 16.7 N/kg at its surface. If the radius of the planet is 8.2×10^6 m, what is its mass and what would be the value of the field potential 40km above its surface? (2 points)

8/10 A 12V electric heater draws 2A for 12 min to raise the temperature of a 3kg block of metal. If the initial temperature is 20° , what would the final temperature be? Assume no heat is lost to the surroundings. (Specific heat capacity of the metal is 500J/(kgK)). (2 points)

9/10 In an adiabatic compression of 3.5 mol of gas at a constant pressure of 2.4×10^3 Pa, the temperature of the gas increases from 200K to 567K. What is the corresponding change in volume? (2 points)

15/11 A power transmission cable has a resistance of 12 ohms per metre. If it loses 500 watts per km of length to heat, what is the output power it delivers a p.d. of 2000 000 volts? (2 points)

37/3 A pendulum of length 2m is swinging between two points 40cm apart. What is the time period of oscillation and the maximum KE of the pendulum if the mass of the pendulum bob is 200g? (2 points)

44/4 A fisherman is standing on a bank. Given that the absolute refractive index of water is 1.33, what must be refractive angle for the angler to see the fish, if his eyes are 3m away from the shower at a height of 1m? (2 points)