35 Medium Calculation Questions based on all the GCSE Physics Equations

1. A 75 kg cyclist speeds up from 4 m/s to 12 m/s. Calculate the increase in kinetic energy.
2. A spring with a spring constant of 500 N/m is compressed from 0.05 m to 0.15 m. Calculate the increase in elastic potential energy stored.
3. A 60 kg climber climbs 12 m up a climbing wall. Calculate the gain in gravitational potential energy.
4. A 2.0 kg pan of water is heated from 18°C to 85°C. The specific heat capacity of water is 4200 J/kg°C. Calculate the energy transferred.
5. A laptop transfers 108000 J of energy in 30 minutes. Calculate its power.
6. A crane does 24000 J of work lifting building materials in 40 s. Calculate its power.
7. An electric motor uses 12000 J of energy and transfers 9000 J usefully into movement. Calculate the efficiency.
8. A machine takes in 1500 W of power and produces 1050 W of useful power. Calculate the efficiency.
9. A current of 0.8 A flows through a circuit for 5 minutes. Calculate the charge flow.
10. A resistor has a potential difference of 9 V across it and a current of 0.3 A. Calculate its resistance.
11. A 230 V oven has a power rating of 2300 W. Calculate the current drawn.
12. A heater has a power output of 720 W and a resistance of 20 Ω. Calculate the current flowing through it.
13. A 1.2 kW toaster is used for 4 minutes. Calculate the energy transferred.

14. A 12 V battery transfers 7200 J of energy. Calculate the charge flow.
15. A metal block has a volume of 0.0004 m^3 and a density of 7800 kg/m^3. Calculate its mass.
16. A 3.0 kg block of ice melts completely. The specific latent heat of fusion is 330000 J/kg. Calculate the energy required.
17. A gas occupies 6.0 m^3 at a pressure of 150000 Pa. It is compressed until its volume is 2.0 m^3. Calculate the new pressure.
18. A lift carries a total mass of 850 kg. Calculate its weight.
19. A warehouse worker pushes a loaded trolley with a force of 120 N over a distance of 18 m. Calculate the work done.
20. A spring stretches by 0.08 m when a force is applied. The spring constant is 1500 N/m. Calculate the force.
21. A mechanic applies a force of 250 N to a spanner 0.35 m long. Calculate the moment produced.
22. A force of 800 N acts on a surface area of 0.04 m^2. Calculate the pressure.
23. A diver is 25 m below the surface of the sea. The density of seawater is 1030 kg/m^3. Calculate the pressure due to the water.
24. A train travels at 32 m/s for 3.5 minutes. Calculate the distance travelled.
25. A car increases its velocity from 12 m/s to 30 m/s in 6 seconds. Calculate its acceleration.
26. A motorbike starts from rest and accelerates at 4 m/s^2 over a distance of 50 m. Calculate its final speed.
27. A 1400 kg car accelerates at 2.5 m/s^2. Calculate the resultant force.
28. A 0.45 kg football is kicked at 24 m/s. Calculate its momentum.
29. A 0.15 kg tennis ball travelling at 40 m/s is brought to rest in 0.03 s. Calculate the average force exerted.
30. A wave has a frequency of 25 Hz. Calculate its period.

31. A sound wave has a frequency of 500 Hz and a wavelength of 0.68 m. Calculate its speed.
32. An image is 18 cm high while the object is 4.5 cm high. Calculate the magnification.
33. A wire 0.25 m long carries a current of 6 A in a magnetic field of 0.40 T. Calculate the force acting on the wire.
34. A transformer has 1200 turns on the primary coil and 80 turns on the secondary coil. The primary voltage is 240 V. Calculate the secondary voltage.
35. A transformer has a primary voltage of 230 V and a primary current of 1.5 A. The secondary voltage is 12 V. Calculate the secondary current.