

Physics paper 1 Core Questions

No.	Question	Answer
1	Name the eight energy stores	Kinetic, gravitational potential, elastic potential, thermal, chemical, nuclear, magnetic, electrostatic
2	Name the four ways that energy can be transferred.	Heating, radiation (waves), electric current and mechanically (by forces.)
3	What does conservation of energy mean?	Energy cannot be created or destroyed only transferred to a different store.
4	What are the units of energy and unit symbol?	Joules J
5	What is work done?	Energy transferred when a force moves an object
6	What energy transfer occurs in boiling a torch?	The chemical store is depleted and the thermal store is filled. The energy is transferred by radiation and heating.
7	Name the unit that represents one joule transferred per second	Watt
8	What does a material's thermal conductivity tell you?	How well it conducts heat
9	Which materials have low thermal conductivity?	Thermal insulators
10	What is a renewable energy source?	An energy resource that will not run out, it is (or can be) replaced at the same rate as it is used
11	What is a non-renewable energy source?	An energy resource that will eventually run out, is not replaced at the same rate as it is being used.
12	What are the non-renewable energy resources?	Coal, oil gas and nuclear
13	What are the renewable energy resources?	Solar, tidal, wind, wave, geothermal, hydroelectric, biofuel.
14	Why are fossil fuels more reliable than wind energy?	It is not windy all the time but currently there is a constant supply of fossil fuels.
15	How does a material become charged?	Becomes negatively charged by gaining electrons and becomes positively charged by losing electrons.
16	What will two objects carrying the same type of charge do if they are brought close to each other?	Repel each other
17	What is an electric field?	Region of space around a charged object in which another charged object will experience an electrostatic force.
18	What happens to the strength of the electric field as you get further from the charged object?	It decreases
19	What is electrical current and what unit is it measured in?	The rate of flow of electrical charge (electrons) Measured in Amps or amperes
20	What piece of equipment measures current?	An ammeter in series
21	What is the pattern for current in a series circuit?	It is the same throughout the whole circuit.
22	What is the pattern for current in a parallel circuit?	It is shared between the components.

23	How do you calculate resistance and what are the units of resistance?	Resistance = Voltage / current Ohms (Ω)
24	What is potential difference and what are the units for potential difference?	Is a measure of how much energy is transferred between two points in a circuit. Volts (V)
25	What is the pattern for potential difference in a series circuit?	It is split between the components.
26	What is the pattern for potential difference in a parallel circuit?	It is the same throughout the whole circuit.
27	What is an ohmic conductor?	Conductor where current is directly proportional to the voltage so resistance is constant (at constant temperature.)
28	What happens to the resistance of a filament lamp as its temperature increases?	Resistance increases
29	What happens to the resistance of a thermistor as its temperature increases?	Resistance decreases
30	What happens to the resistance of a light-dependent resistor when light intensity increases?	Resistance decreases
31	Why is the current provided by a cell called a direct current? (d.c)	Only flows in one direction
32	What is an alternating current? (a.c.)	Current that repeatedly reverses direction
33	What kind of current is supplied by mains electricity and what is the frequency and voltage of mains electricity?	Alternating current 50Hz and 230V
34	What colours are the live, neutral and earth wires in a three-core cable?	Live = brown, neutral = blue, earth = green and yellow stripes
35	What is the function of the live wire in a plug?	Carries the Alternating Current to the device
36	What is the function of the neutral wire in a plug?	Completes the circuit so that current can flow
37	What is the function of the earth wire in a plug?	It is a safety wire to stop a device becoming live, if there is a fault.
38	What is the national grid?	A system of cables and transformers that links power stations and consumers.
39	What do step up transformers do to electricity?	Increase the potential difference and decrease the current.
40	Why do step up transformers increase efficiency?	To reduce the energy lost as heat to the surroundings
41	What is specific heat capacity?	The amount of energy required to raise the temperature of 1kg by 1°C.
42	What is specific latent heat of fusion?	Energy needed to change 1kg of the substance from a solid to a liquid at its melting point, without changing its temperature.
43	What is specific latent heat of vaporisation?	Energy needed to change 1kg of the substance from liquid to vapour at its boiling point without changing its temperature.
44	Name the three types of nuclear radiation.	Alpha, Beta and Gamma
45	What is radioactive activity?	The rate at which a source of unstable nuclei decays

46	What is meant by count rate?	Number of decays recorded each second (by a detector, eg Geiger-Muller tube.)
47	What is meant by the half life of a radioactive source?	Time taken for half the unstable nuclei to decay or the time taken for the count rate to halve
48	What is an isotope?	Atoms of the same element (same number of protons) but different numbers of neutrons
49	What is irradiation?	Exposing an object to radiation
50	What is radioactive contamination?	Unwanted presence of substances containing radioactive atoms on or in other materials

Physics Paper 2

1	What is a scalar quantity?	It has magnitude (size) only. For example: time, voltage, energy.
2	What is a vector quantity?	It has a magnitude and a direction. For example: velocity, force, displacement.
3	We represent vectors with arrows. What do the length and direction of the arrow show?	The length represents the magnitude and the direction shows the direction of the vector.
4	What is a force?	A force is a push or pull that acts on an object due to the interaction with another object.
5	What is a contact force?	The objects are physically touching. For example: friction, air resistance, tension and normal contact force.
6	What is a non-contact force?	The objects are physically separated. For example: gravitational force, electrostatic force and magnetic force.
7	What is weight?	Weight is the force acting on an object due to gravity.
8	What causes the gravitational force close to the Earth?	The mass of Earth causes the gravitational field around the Earth.
9	What is a resultant force?	A number of forces acting on an object may be replaced by a single force that has the same effect as all the original forces acting together
10	What is the same about the interaction pair of forces when two objects interact with each other?	The forces are the same magnitude (size).
11	What is the centre of mass?	The point through which the weight of an object can be considered to act.
12	What is elastic deformation?	An object can go back to its original shape and size when deforming forces are removed
13	What is inelastic deformation?	An object does not go back to its original shape and size when deforming forces are removed.
14	What is the difference between distance and displacement?	Distance is a scalar quantity and only has a magnitude (size), displacement is a vector quantity and has both magnitude and direction.
15	What is the difference between speed and velocity?	speed is a scalar quantity and only has a magnitude (size), velocity is a vector quantity and has both magnitude and direction.
16	What are the typical speeds of a person walking, running and cycling?	1.5m/s, 3.0m/s and 6.0m/s respectively

17	What are the typical speeds of a car and a train?	13-30m/s and 50m/s respectively
18	What is a typical speed for sound traveling in air?	330m/s
19	What is acceleration?	Change in velocity of an object per second
20	What are the units of acceleration?	m/s^2
21	State Newton's First Law:	An object at rest will remain at rest and a moving object will continue moving at constant velocity as long as no resultant force acts on the object.
22	What is needed for velocity of an object to change?	An unbalanced/resultant force
23	What is inertia?	The tendency of objects to continue in their state of rest or of uniform motion is called inertia.
24	State Newton's Second Law:	The acceleration of an object is proportional to the resultant force acting on the object, and inversely proportional to the mass of the object
25	What is the word equation for Newton's Second Law?	force = mass x acceleration
26	State Newton's Third Law:	Whenever two objects interact, the forces they exert on each other are equal and opposite.
27	What is the stopping distance of a vehicle?	It is the sum of the distance the vehicle travels during the driver's reaction time (thinking distance) and the distance it travels under the braking force (braking distance).
28	For a given braking force, how does stopping distance change with speed of the vehicle?	For a given braking force the greater the speed of the vehicle, the greater the stopping distance.
29	What can affect a driver's reaction time?	Tiredness, drugs and alcohol. Distractions may also affect a driver's ability to react.
30	What factors may affect the braking distance of a vehicle?	The braking distance of a vehicle can be affected by adverse road and weather conditions (such as wet and icy) and poor condition of the vehicle (such as the brakes and tyres).
31	What can happen if the braking force used to stop a vehicle is very large?	Brakes may overheat/car may skid
32	What are the two types of waves?	Longitudinal and transverse.
33	Describe a transverse wave.	Oscillations are at right angles, perpendicular, to the direction of travel.
34	What is an example of a transverse wave?	Water and electromagnetic waves.
35	What is the amplitude of a wave?	The maximum height of the wave from the centre line.
36	What is the wavelength of a wave and what is the unit?	The distance from one point on a wave to the same point on the next wave. E.g. peak to peak or trough to trough. The unit is metres
37	What is the frequency of a wave and what is the unit?	The number of waves per second and Hertz (Hz)
38	Describe a longitudinal wave.	Oscillations are along the same direction as the direction of travel.
39	What is an example of a longitudinal wave?	Sound

40	What is an area of compression on a longitudinal wave?	Where the waves are close together.
41	What is an area of rarefaction on a longitudinal wave?	Where the waves are far apart.
42	What are electromagnetic waves?	A spectrum of waves that travel at the same velocity through a vacuum or air.
43	List the EM spectrum from long to short wavelength.	Radio, microwave, infrared, visible, UV, X-rays, gamma
44	What is refraction?	A wave changing speed (and therefore direction) when it is being transmitted through a material.
45	A wave is refracted from air into a glass block- what direction will the wave move?	The wave will slow down as the medium has got more dense- therefore the wave will refract towards the normal.
46	A wave is refracted from a glass block into air- what direction will the wave move?	The wave will speed up as the medium has got less dense- therefore the wave will refract away from the normal.
47	What happens when like and unlike poles are brought together?	Like = repel, unlike = attract
48	What is the difference between a permanent and an induced magnet?	Permanent magnet produces its own magnetic field, induced is a material that becomes magnetic when it is put in a magnetic field.
49	What materials are magnetic?	Iron, nickel, cobalt and steel.
50	What is a solenoid?	Conductive wire that has been coiled.