PURE PHYSICS DEFINITIONS

Physical quantity	A physical quantity is a quantity that can be measured. It consists of a numerical magnitude and a unit .
Period	The period of a simple pendulum is the time taken for one complete oscillation .
Scalar quantities	Scalar quantities are physical quantities that have only magnitude .
Vector quantities	Vector quantities are physical quantities that have both magnitude and direction .
Distance	The total length covered by a moving object regardless of the direction of motion.
Displacement	The distance measured in a straight line in a specified direction.
Speed	Distance travelled per unit time
Velocity	Rate of change of displacement
Acceleration	Rate of change of velocity
Uniform acceleration	Constant rate of change of velocity
Gradient of d-t graph	Gives the velocity of the object
Gradient of v-t graph	Gives the acceleration of the object
Area under v-t graph	Gives the displacement of the object

Mass	Measure of the amount of matter in a body .
Weight	Gravitational force acting on an object that has mass.
Gravitational field	A region in which a mass experiences a force due to gravitational attraction.
Gravitational field strength, g	Gravitational force per unit mass placed at that point.
NIL	Newton's First Law of Motion states that every object will continue in its state or uniform motion in a straight line unless a resultant force acts on it.
Inertia	Reluctance of the object to change its state of rest or motion, due to its mass .
N2L	Newton's Second Law of Motion states that when a resultant force acts on an object of a constant mass, the object will accelerate in the direction of the resultant force.
N3L	Newton's Third Law of Motion states that if body A exerts a force F_{AB} on body B, then body B will exert an equal and opposite force F_{BA} on body A.
Friction	Contact force that opposes or tends to oppose motion between surfaces in contact .
Moment of a force, torque	The moment of a force about a pivot is the product of the force F and the perpendicular distance d from the pivot to the line of action of the force.
Principle of moments	When a body is in equilibrium , the sum of clockwise moments about a pivot is equal to the sum of anticlockwise moments about the same pivot .

Centre of gravity	Imaginary point where the entire weight of the object seems to act.
Stability of an object	Measure of its ability to return to its original position.
Pressure	Force acting per unit area
Pascal's law	If a pressure is applied to an enclosed liquid, the pressure is transmitted to all other parts of the liquid undiminished.
Density	Mass per unit volume
Principle of conservation of energy	Energy cannot be created or destroyed . Energy can be transferred from one store to another . The total energy of an isolated system is constant .
Work done	Product of the force and the distance moved by the object in the direction of the force.
Power	Work done or energy transferred per unit time.
Kinetic particle model of matter	Made up of tiny particles that are in continuous motion.
Temperature	Temperature rises with the average kinetic energy of the particles in a body and vice versa.
Thermal equilibrium	State in which two or more objects have the same temperature and that there is no net transfer of energy between them .

Conduction	Process of energy transfer where energy is transferred through the passing on of vibrational motion from one particle to another .
Convection	Process of energy transfer where energy is transferred by means of convection currents of a fluid (liquid or gas), due to a difference in density
Radiation	Process of energy transfer where energy is transferred by electromagnetic waves. It does not require a medium.
Internal energy	Internal energy is an energy store that is made up of the total kinetic energy associated with the random motion of the particles and the total potential energy between the particles in the system.
Heat capacity	Heat capacity of an object is the change of its internal energy per unit change in its temperature.
Specific heat capacity	Specific heat capacity of a material is the change of its internal energy per unit mass for each unit change in its temperature.
Latent heat	Energy released or absorbed to change the state of a substance, at constant temperature.
Latent heat of fusion	Amount of energy transferred to change a substance between the solid and liquid states, at constant temperature.
Specific latent heat of fusion	Amount of energy transferred per unit mass of a substance to change between the solid and liquid states, at constant temperature.

Latent heat of vaporisation	Amount of energy transferred to change a substance between the liquid and gaseous states, at constant temperature.
Specific latent heat of vaporisation	Amount of energy transferred per unit mass of a substance to change between the liquid and gaseous states, at constant temperature.
Wave	Disturbance that propagates through space, transferring energy with it but not matter.
Transverse wave	Direction of vibration that is perpendicular to the direction of wave travel.
Longitudinal wave	Direction of vibration that is parallel to the direction of wave travel.
Wavefront	Imaginary line joining all adjacent points that are in phase.
Infrasound	Frequencies below 20 Hz
Infrasound Ultrasound	Frequencies below 20 Hz Frequencies above the upper limit of the human range of audibility. Frequencies above 20 000 Hz / 20 kHz.
Infrasound Ultrasound Refraction	Frequencies below 20 Hz Frequencies above the upper limit of the human range of audibility. Frequencies above 20 000 Hz / 20 kHz. Bending of light as it passes from one optical medium to another.
Infrasound Ultrasound Refraction Refractive index	Frequencies below 20 Hz Frequencies above the upper limit of the human range of audibility. Frequencies above 20 000 Hz / 20 kHz. Bending of light as it passes from one optical medium to another. Ratio of the speed of light in a vacuum to the speed of light in that medium.

Critical angle	Angle of incidence in an optically denser medium for which the angle of refraction in the less dense medium is 90°.
Total internal reflection	Complete reflection of a light ray in an optically denser medium at the boundary with an optically less dense medium.
Electric field	A region in which an electric charge experiences an electric force.
Electric current	Rate of flow of electric charge.
Electromotive force	Work done by the source in driving a unit charge around a complete circuit.
Potential difference	Potential difference across a component in a circuit is the work done per unit charge in driving charges through the component.
Resistance	Ratio of the potential difference across it to the current flowing through it.
Potential divider	Voltage divider, which makes use of the voltage drop across resistors in series to divide voltage.
Induction	Takes place when a magnetic material is placed close to a strong magnet or within a current-carrying solenoid.
Magnetic field	A region in which the force of magnetism acts.
Temporary magnets	Magnets that retain their magnetism in the presence of an electric current or a permanent magnetic field.
Permanent magnets	Do not require the presence of an electric current of a permanent magnetic field to retain their magnetism.
Electromagnetic induction	Process through which an induced e.m.f. is produced in a conductor due to a changing magnetic field

Faraday's Law of electromagnetic induction	Magnitude of the induced e.m.f. in a circuit is directly proportional to the rate of change of magnetic flux in the circuit. Magnetic flux is the magnetic field in a given area.
Lenz's Law	Direction of the induced e.m.f. and hence the induced current in a closed circuit, is always such that its magnetic effect opposes the motion or change producing it.
Proton number	Number of protons in an atom.
Nucleon number	Total number of neutrons and protons in the nucleus of an atom.
Isotopes	Atoms of the same element that have the same number of protons but different number of neutrons.
Nuclear decay	Random process by which an unstable atomic nucleus loses its energy by emission of electromagnetic radiation or particle(s).
Ionisation	Ability to eject electrons from atoms to form ions.
lonising radiation	Radiation with high energies that can knock off electrons from atoms to form ions.
Background radiation	Nuclear radiation in an environment where no radioactive source has been deliberately introduced.
Half-life	Time taken for half the nuclei of that nuclide in any sample to decay.
Nuclear fission	Process in which the nucleus of an atom splits and releases a huge amount of energy
Nuclear fusion	Process in which two light atomic nuclei combine to form one heavier atomic nucleus and releases a huge amount of energy

COMMONLY TESTED QUESTIONS [Non-exhaustive]

Newtonian Mechanics

Question	Answer
State what is meant by the <u>moment</u> of a force. [1]	The moment of a force about a pivot is the product of the force F and the perpendicular distance d from the pivot to the line of action of the force.
State the <u>Principle of Conservation of</u> <u>Energy</u> . [1]	Energy cannot be created or destroyed. Energy can be transferred from one store to another. The total energy of an isolated system is constant.
State the <u>Principle of Moments for a</u> <u>body in equilibrium</u> . [1]	A: When a body is in equilibrium, the sum of clockwise moments about a pivot is equal to the sum of anticlockwise moments about the same pivot .
Define gravitational field strength . [1]	Gravitational force per unit mass placed at that point.

Thermal Physics

Question	Answer
Define the term 'specific heat capacity'. [1]	Specific heat capacity of a material is the change of its internal energy per unit mass for each unit change in its temperature .

Waves

Question	Answer
State what is meant by <mark>focal</mark> length. [1]	The distance between the optical centre C and the principal focus point F .
State what is meant by <u>critical</u> <u>angle</u> . [1]	Angle of incidence in an optically denser medium for which the angle of refraction in the less dense medium is 90°.
Explain what is meant by a <u>transverse wave</u> . [1]	A transverse wave has a direction of vibration that is perpendicular to the direction of wave travel.
Explain what is meant by a wavefront. [1]	Imaginary line joining all adjacent points that are in phase.
Explain what is <u>total internal</u> <u>reflection</u> . [1]	Complete reflection of a light ray in an optically denser medium at the boundary with an optically less dense medium .