# Physics (New Book) - 9th Class Physics Chapter 1 Long Question Preparation

Q1. Define physics and explain its branches

**Ans 1:** Physics: the branch of science which deals with the study of matter, energy and their mututal relationship is called physics

Branches of physics
Mechanics: The branch of physics which deals with the study of matter, energy and their mutual relationship is called physics

**Ans 2:** Heat: The branch of physics which deals with the nature of heat, modes of transfer and effects of heat is called heat

Sound: The branch of physics which deals with the study of physical aspects of sound wave, their production, properties and applications is called sound

**Ans 3:** Light: The branch of physics which deals with the study of physical aspects of lights ,its properties, working and use o optical instruments is called light

Electricity and magnetism: The branch of physics which deals with the study of charges at rest and in motion, their effects and their relationship with magnetism is called electricity and magnetism

**Ans 4:** Atomic physics: The branch of physics which deals with the study of structure and properties of atoms is called atomic physics

Nuclear physics: The branch of physics which deals with the study of properties and behavior of nuclei and their particles within nuclei is called nuclear physics

**Ans 5:** plasma: physics : The branch of physics which deals with the study of production, properties of ionic state of matter the fourth state of matter , is called plasma physics .

Geo physics: The branch of physics which deals with the study of internal structure of the earth is called geophysics

---

Q2. Write a note on Ripple Tank?

**Ans 1:**

---

Q3. What is screw gauge. How a screw gauge is used to measure diameter of thin wire

**Ans 1:** Definition: An instrument which can measure length correct up to 0.01 mm or 0.001 cm is called a screw gauge

Micrometer screw gauge: An instrument which can measure length correct up to 10th part of millimeter is called micro meter screw gauge

**Ans 2:** Construction: A simple screw gauge consists of a U shaped metal frame with a metal stud at its on end . A hollow cylinder has a millimeter scale over it along a line called index line parallel to its axis. The hollow cylinder acts as a nut. It is fixed at the end of U shaped frame opposite to the stud. A thimble has a threaded spindle inside it.

**Ans 3:** pitch of screw gauge: The distance moved by spindle along index line as the thimble complete on rotation is called pitch of

screw gauge i.e.1mm.spindle has 100 divisions around its one end. It is the circular scale of the screw gauge. As thimble completes one rotation, 100 pass the index line and the thimble moves 1 mm along the main scale

**Ans 4:** Least count of the screw gauge: Least count of a screw gauge can also be found by dividing pitch of screw gauge on number of divisions on circular scale i.e. 0.01mm or 0.001 cm
Least count = Pitch of screw gauge/no .of divisions on circular scale

**Ans 5:** Zero correction: Knowing zero error, necessary correction can be made to fine the correction such correction is called zero correction of the instrument. OR
The inverse of zero error is called zero correction.
Note: zero correction will be positive or negative

---

Q4. Your hair grow at the rate of 1mm per day . Find their growth rate in nms^-1

**Ans 1:** Solution: Rate of growth = 1mm per day =1mm/day =1x10^-3m/24x60x60s = 0.0000000115ms^-1 = 11.57 x10^-9 ms^-1 = 11.57 nms^-1

---

Q5. Write a note on mass measuring instruments

**Ans 1:** Introduction: Pots were used to measure grain in various part of the world in the ancient time . However, balances were also in use by Greeks and Romans.

**Ans 2:** beam balance: Beam balances are stil in use at may places . In a beam balance, the unknown mass is placed in one pan . It is balanced by putting known masses in the other pan.
Today people use many types of mechanical and electronic balances. you might have seen electronic balances in sweet and grocery shops. There are more precise than beam balances and are easy to handle.

**Ans 3:** Physical Balance: a physical balance is used in the laboratory to measure the mass of various objects by comparison
Construction: It consists of a beam resting at the centre on a fulcrum. The beam carries scale pans over the hooks on either side. unknown mass is placed on the left pan. Find some suitable standard masses that cause the pointer to reman at zero on raising the beam

**Ans 4:** Lever Balance : A lever balance consists of a system of levers. When lever is lifted placing the object in one pan and standard masses on the other pan, the pointer of the lever system moves. The pointer is brought to zero by varying standard mases. LC of lever balance is 0.01g ror 10mg

**Ans 5:** Electronic balance: Electronic balance comes in various ranges; milligram range, gram ranges and kilogram ranges. Before measuring the mass of a body, it is switched on and its reading is set to zero. Next place the object to the weighed. The reading on the balance gives you the mass of the body placed over it.

---

Q6. Write note on significant figure

**Ans 1:** Significant figure: All the accurately known digits and the first doubtful digit in as expression are called significant figures. It reflects the precision of measure value of a physical quantity
Explanation: The value of a physical quantity is expressed by a number, along with suitable units. The accuracy in the measurement of a physical quantity depends upon
The quality of the measuring instrument
The skills of the observer
The number of observation made
The improvement in the quality of measurement can be made by using better measuring instrument, the more is value of precision more significant figure means greater precision

**Ans 2:** Rules of significant figure: The follow rules are helpful in identifying significant figure
Non zero digits are always significant
Zeros between two significant figures are also significant
Final or ending zeros on the right in decimal fraction are significant
Zeros written on the left side of the decimal point for the purpose of spacing the decimal point are not significant
In whole number s that end in one or more zeros without a decimal point these zeros may or may not be significant. In such case, express the quantity using scientific notation to find the significant zeros

---

Q7. Define physical quantities and explain its types

**Ans 1:** Physical quantities: All measurable quantities are called physical quantities
Example: length, mass, time, temperature etc

**Ans 2:** Characteristics: A physical quantity possesses at least two characteristics:
Numerical magnitude , A unit in which it is measured
Example: If length of student is 104 cm then 104 is numerical magnitude

**Ans 3:** Types: physical quantities are of two types
Base quantities, Derived quantities

**Ans 4:** Base quantities: base quantities are those on the basis of which other quantities are expressed
Example: There are seven base quantities
length, time, mass, temperature. electric current, intensity of light, amount of a substance.

**Ans 5:** Derived quantities: The derived quantities are those quantities which are expressed in term of base quantities
Example: Area, volume, speed, force , work , energy, power , electric charge, electric potential etc

---

Q8. Define scientific notation. describe it with examples

**Ans 1:** Scientific Notation; In scientific notation a number is expressed as some power of ten multiplied by a number between 1 and 10. A simple but scientific way to write large or small numbers is to express them in some power of ten.
The Moon is 3.84*10m. This form of expressing a number is called the standard form or scientific notation. This saves writing down or interpreting a large numbers of zeros

**Ans 2:** Standard Form; Number that has on e non zero digit before the decimal preferable to taken as standard

---

Q9. What are prefixes, explain it with examples

**Ans 1:** Prefixes; The words or letters added before a unit and stand for multiples or sub multiples of that unit are known as prefixes
Examples; kilo, mega, nano, micro etc.
Note ; The pre fixes are useful to express very large or small quantities.
double pre fixes are note used for examples no pre fix is used with kilogramme

---

Q10. What are measuring instruments, write the name of some length measuring instruments

**Ans 1:** Measuring instruments; Measuring instruments are used to measure various physical quantities such as length, mass time , volume etc. measuring instruments used in the past for example sundial, water cock and other time measuring devices used around 1300 AD were quite crude/ on the other hand, digital clocks and watches used now a day are highly reliable and accurate

**Ans 2:** Length measuring instruments: length measuring instruments are following meter rule , measuring tape. vernier caliper . screw gauge