Physical Quantities and Measurement

Q1. Define Science. Moreover, from which word is it derived?

Ans: The knowledge gained through observations and experimentations is called Science. The word science is derived from the Latin word Scientia which means knowledge.

Q2. Write three lines about importance of physics in our daily life.

Ans: In present age all technology mostly related with physics. For example car is made on principles of Mechanics.

Electricity , which is the source of light and heat is a miracle of physics.

Means of Transportation i.e., Aeroplan, Car and household things like air conditioner, washing machine and micro wave oven are blessing of physics.

Q3. Define Mechanics.

Answer: The branch of physics which deals with the study of motion of objects, its causes and effects is called mechanics.

Q4.Define Heat.

Ans: The branch of physics which deal with the study of heat, modes of transfer of heat and effect of heat is called Heat.

Q5. Define Sound.

Ans: This branch of physics deals with the physical aspects of sound waves, their production, properties and applications.

Q6. Define Light.

Ans: This branch of physics deals with study of physical aspects of light, its properties, working and use of optical instruments.

Q7. Define electricity and Magnetism.

Ans: It is the study of the charges at rest and in motion, their effects and their relationship with magnetism.

Q8. Define Atomic physics.

Ans: This branch of physics deal with the study of structure of atom and properties of atom.

Q9. Define Nuclear physics.

Ans: It deals with the properties and behavior of nuclei and the particles with in the nuclei.

Q10. What is plasma physics?

Ans: It is the study of production, properties of the ionic state of matter – the fourth state of matter(plasma).

Q11. Define Geophysics.

Answer: It is the study of the internal structure of the Earth.

Q12. What are physical quantities? Give example.

Ans. All measurable quantities are called physical quantities. i.e., length, mass, time.

Q13.What is meant by base quantities? Give example.

Ans: Base quantities are the quantities on the basis of which other quantities are expressed. i.e., Length, mass, time, etc.

Q14.What are derived quantities? Give example.

Ans: The quantities that are expressed in terms of base quantities are called derived quantities. i.e., area , volume, speed ,force etc.

Q15.Define SI system.

Ans: The International System of Unit consist of base and derived units is called SI System.

Q16. What are base and derived units? Give example

Ans:

Base Unit: Unit of a base quantity is called base unit. i.e., the unit of Length is meter.

Derived Unit: Unit of derived quantity is called derived unit. i.e., Unit of Volume is m^3 .

Q17. What are prefixes? Give example.

Ans: Prefixes are the words or letter which are added before SI Units to make them smaller or larger. i.e., kilo, mega, milli, giga etc.

Q18. Define Scientific Notation. Give example.

Answer: A simple but scientific way to write large or small numbers. In Scientific notation a number is expressed as some power of ten multiplied by a number between 1 and 10. i.e., 6.2×10^{12}

Q19. Define Least count. Moreover write down the least count of meter rule.

Ans: The smallest reading that can be taken using a measuring instrument is called the least count of that measuring instrument.

Least count of Meter Rule: 1 mm

Q20. What is the use of Vernier Calipers? Also write down its least count.

Ans: In physics we are to deal with very small measurement. The instrument which is used to measure very small lengths is called vernier calipers. With vernier calipers we can measure length up 0.1 mm or 0.01 cm.

Least count of Vernier Calipers: 0.1 mm or 0.01 cm

Q21. Define Vernier constant.

Ans: In Vernier Calipers the difference between one main scale division and vernier scale division is called vernier constant. It is also called least count of vernier calipers.

In Vernier Caliper One main scale division= 1mm

In Vernier Calipers One vernier scale division= 0.9mm

Vernier constant= 1mm-0.9mm

=0.1mm

Q22. What is Screw Gauge? Write down its least count.

Answer: The instrument which is used to measure very small measurements is called micro meter screw gauge. It is used to measure diameter a wire, or thickness of a metal sheet.

Least count of screw gauge= 0.01mm or 0.001cm

Q23: How is least count of screw gauge found?

Answer: We can find the least count of Screw Gauge by using this formula.

Least count of Screw gauge= Pitch of screw gauge/No of division on circular scale.

Q24: What is the use of physical balance?

Ans: Physical balance is used to measure the mass of body.

Q25: Define Lever balance.

Ans: 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 is brought to zero by varying standard masses.

Q26: What is stop watch? Write down its least count.

Ans: A device which is used to measure time interval in laboratory is called stop watch. It is given this name because it has start and stop button.

Least count of analog stop watch=0.1 sec.

Least count of digital stop watch=0.01 sec.

Q27: What is the use of measuring cylinder in laboratory.

Ans: Measuring cylinder is a cylinder made of plastic or glass. In laboratory it is used to measure the volume of liquid.

Q28: Define significant figures. How are they related with accuracy/precision of measurement?

Ans: All the accurately known digits and the first doubtful digit in an expression are called significant figures. It reflects the precision of measured value of a physical quantity.

Q29: Why is the use of zero error necessary in a measuring instrument?

Ans: Defect in a measuring instrument is called zero error. It is recommended to find zero error in instrument (if any) and remove it using zero correction to find accurate measurement.

Use of Zero correction may increase the accuracy of measurement.