UNIT 1- MEASUREMENT

Class: VIII

Subject: Science

I. Choose the best answer.

1. Which one the following systems of unit is the British System of unit?

a) CGS b) MKS **c) FPS** d) SI

2. Electric current is a _____quantity

a) base b) supplementary c) derived d) professional

3. SI unit of temperature is _____

a) Celsius b) Fahrenheit **c) Kelvin** d) ampere

4. Luminous intensity is the intensity of _____

a) Laser light b) UV light **c) Visible light** d) IR light

5. Closeness of two or more measured values is called as _____

a) Accuracy **b) precision** c) error d) approximation

6. Which one of the following statement is wrong?

a) Approximation gives accurate value.

b) Approximation simplifies the calculation.

c) Approximation is very useful when little information is available.

d) Approximation gives the nearest value only.

II. Fill in the blanks.

1. The solid angle is measured in **Steradian.**

2. The coldness or hotness of a substance is expressed by **Temperature**

3. **Ammeter** is used to measure electric current.

4. One mole of a substance contains **6.023×10^{23}** atoms or molecules.

5. The uncertainty in measurement is called as **Errors**

6. The closeness of the measured value to the original value is **Accuracy**

7. The intersection of two straight lines gives us **Plane angle**

III. State true or false. If false,correct the statement.

1. Temperature is a measure of total kinetic, energy of the particles in a system. **[TRUE]**

2. If one coulomb of charge is flowing in one minute, it is called 'ampere'. **[FALSE]**

3. Amount of substance gives the number of particles present in a substance. **[TRUE]**

4. Intensity of light coming from a candle is approximately equal to one 'candela'. **[TRUE]**

5. Quartz clocks are used in GPS devices. **[FALSE]**

6. Angle formed at the top of a cone is an example for 'plane angle'. **[FALSE]**

7. The number 4.582 can be rounded off as 4.58. **[TRUE]**

IV. Match the following.

1. Temperature	-	Closeness to the actual value	[4]
2. Plane angle	-	Measure of hotness or coldness	[1]
3. Solid angle	-	Closeness to two or more measurements	[5]
4. Accuracy	-	Angle formed by the intersection of three or more Planes	[3]
5. Precision	-	Angle formed by the intersection of two planes	[2]

V. Consider the statements given below and choose the correct option.

1. **Assertion:** The SI system of units is the suitable system for measurements.

Reason: The SI unit of temperature is Kelvin

Ans : a. Both assertion and reason are true and reason is the correct explanation of the assertion.

2. **Assertion:** Electric current, amount of substance, luminous intensity are the fundamental physical quantities.

Reason: They are independent of each other

Ans : a. Both assertion and reason are true and reason is the correct explanation of the assertion.

3. **Assertion:** Radian is the unit of solid angle.

Reason: One radian is the angle subtended at the centre of a circle by an arc of length equal to its radius.

Ans: c. Assertion is true, but reason is false.

VI. Answer very briefly.

1. How many base quantities are included inSI system? **Ans: 7**

2. Give the name of the instrument used for the measurement of temperature.

Ans: Thermometer

3. What is the SI unit of luminous intensity? **Ans: Candela**

4. What type of oscillations are used in atomic clocks? **Ans: Caesium -133**

5. Mention the types of clocks based on their display. **Ans: Digital**

6. How many times will the 'minute hand' rotate in one hour? **Ans: One-time**

7. How many minute are there in a hours? **Ans: 60**

VII. Answer briefly.

1. What is measurement?

It is the process of finding an unknown physical quantity by using a standard quantity.

2. Name the three scales of temperature.

Some common systems of units are as follows.

1. FPS System (Foot for length, Pound for mass and Second for time)
2. CGS System (Centimetre for length, Gram for mass and Second for time)
3. MKS System (Meter for length, Kilogram for mass and Second for time)

3. Define - Ampere.

If one coulomb of charge is flowing through a conductor in one second, then, the amount of current flowing is said to be one ampere.

4. What is electric current?

The magnitude of electric current is the amount of electric charges flowing through a conductor in one second.

$$\text{Electric current} = \frac{\text{Amount of electric charge}}{\text{time}}$$

$$I = \frac{Q}{t}$$

5. What do you mean by luminous intensity?

The measure of the power of the emitted light, by a light source in a particular direction, per unit solid angle is called as luminous intensity. The SI unit of luminous intensity is candela and is denoted as 'cd'.

6. Define - Mole.

Mole is defined as the amount of substance, Which contains 6.023×10^{23} entities. It is denoted as 'mol'.

7. What are the differences between plane angle and solid angle?

Plane Angle	Solid Angle
1. It is the angle made at the point of intersection of two lines or planes.	1. It is the angle by the intersection of three or more planes at a common point.
2. It is two dimensional	2. It is three dimensional.
3. Its unit is radian.	3. Its unit is steradian.

VIII. Answer in detail.

1. List out the base quantities with their units.

Quantity	Unit	Symbol
Length	metre	m
Mass	kilogram	kg
Temperature	kelvin	K
Electric Current	ampere	A
Amount of Substance	mole	mol
Luminous intensity	candela	cd
Time	second	s

2. Write a short note on different types of clocks.

There are two types of clocks based on display. They are:

1. Analog clocks

2. Digital clocks

1. Analog clocks

Analog clocks look like a classic clock. It has three hands to show the time.

Hours hand

It is short and thick. It shows 'hour'.

Minutes hand

It is long and thin. It shows 'minute'.

Seconds hand

It is long and very thin. It shows 'second'. It makes one rotation in one minute and 60 rotations in one hour.

Analog clocks can be driven either mechanically or electronically.

Figure 1.9 Analog clock

2. Digital clocks

A digital clock displays the time directly.It shows the time in numerals or other symbols. It may have 12 hours or 24 hours display. Recent clocks are showing date, day, month, year, temperature e n called as electronic clocks.

Figure 1.10 Digital clock

Types of clock based on working mechanism

There are different types of clocks based on working mechanism. They are:

1. Quartz clock

2. Atomic clock

1. Quartz clock

These clocks are activated by 'electronic oscillations', which are controlled by a 'quartz crystal'. The frequency of a vibrating crystal is very precise.

So, quartz clock is more accurate than mechanical clock. clocks have an accuracy o f one second in every 109 seconds.

Figure 1.11 Quartz clock

2. Atomic clock

These clocks make use of periodic vibrations occurring within the atom. These clocks have an accuracy of one second in every 10^{13} seconds.

Atomic clocks are used in Global Positioning System (GPS), Global Navigation Satellite System (GLONASS) and International Time Distribution Services.

IX. Higher Order Thinking Question.

1. Your friend was absent to school yesterday. You are enquiring about his absence. He told that he had fever and it was measured to be 100oC. Is it possible to have 100 0c Fever? If he is wrong, try to make him understand.

Ans :

No. it is not possible of 100^0c fever. The normal temperature of human body is between 98.4^0 F and 98.4^0F .

So, he should say that he was affected by ever of 100 ^{0}c F and it is not 100^0 C.