MEASUREMENT AND SI UNITS BASED GENERAL SCIENCE MCQ PRACTICE QUESTIONS AND ANSWERS PDF WITH EXPLANATION

For All Competitive SSC, Bank, IBPS, UPSC, Railway, IT & Other Govt. Exams

Created By Careericons Team

Q1. 'Light Year' is

a) The time which Sun rays take to reach the Earth

b) The year in which February has 29 days

c) The distance travelled by light in one year

d) The time in which a spacecraft reaches Moon from the Earth

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Q2. Light year is

a) the distance travelled by light in free space in one year

b) light emitted by the sun in one year

c) time taken by light to travel from sun to earth

d) time taken by earth to go once around the sun

Q3. Which one of the following is **not** a dimensionless quantity?

a) Frequency

b) Strain

c) Relative density

d) Angle

Q4. Which of the following systems of units is **not** based on units of mass, length and time alone?

a) CGS

b) SI

c) MKS

d) FPS

Q5. The numerical ratio of displacement to the distance covered is always.

a) equal to or less than one

b) less than one

c) equal to one

d) equal to or greater than one

Q6. Which of the following is **not** a fundamental unit?

a) metre

b) newton

c) kilogram

d) second

Q7. Assertion :
Density is a derived physical quantity.
Reason :
Density cannot be derived from the fundamental physical quantities.

a) If Assertion is correct but Reason is incorrect.

b) If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

c) If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

d) If Assertion is incorrect but Reason is correct.

Q8. A stone is thrown vertically upwards with an initial velocity u from the top of a tower of height g ${12u^2}/g$. With what velocity does the stone reach the ground ?

a) 5u

b) u

c) 4u

d) 2$?{6}$u

Q9. Which one of the following is **not** correctly matched?

a) Nautical miles - Unit of naval distance

b) Decibel - Unit of sound intensity

c) Horsepower - Unit of power

d) Celsius - Unit of heat

Q10. Match List-I with List-II and select the correct answer using the code given below the lists.

List I (Physical quantities)	List-II (Units)
A. Acceleration	1. Joule
B. Force	2. Newton second
C. Work done	3. Newton
D. Impulse	4. Metre/second^2

Code: (A) (B) (C) (D)

a) 2 3 4 1

b) 1 2 3 4

c) 3 4 1 2

d) 4 3 1 2

Q11. A passenger in a moving train tosses a five rupee coin. If the coin falls behind him, then the train must be moving with a uniform

a) speed

b) acceleration

c) deceleration

d) velocity

Q12. The unit of the force is

a) Newton

b) Faraday

c) Fermi

d) Rutherford

Q13. How many watts are there in a horsepower?

a) 746

b) 1000

c) 750

d) 748

Q14. Which one of the following characteristics of the particle does the shaded area of the velocity-time graph shown represent?

measurement motion question answer 28

a) Distance covered

b) Momentum

c) Acceleration

d) speed

Q15. 1 Kg/cm^2 pressure is equivalent to

a) 10.0 bar

b) 0.1 bar

c) 1.0 bar

d) 100.0 bar

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Answers to the above questions :

Q1. Answer: (c)

Light-year is the **distance light travels in one year**.

Light zips through interstellar space at 186,000 miles (300,000 kilometres) per second and 5.88 trillion miles (9.46 trillion kilometres) per year.

Q2. Answer: (a)

A light-year, alternatively spelt lightyear, is a large unit of length used to express astronomical distances and is equivalent to about 9.46 trillion kilometres (9.46×1012 km), or 5.88 trillion miles (5.88×1012 mi).

As defined by the International Astronomical Union (IAU), a light-year is a distance that light travels in a vacuum in one Julian year (365.25 days).

Because it includes the time-measurement word "year", the term light-year is sometimes misinterpreted as a unit of time.

The **way to calculate the light-year distance** is henceforth explained:

299792458 x 60 x 60 x 24 x 365.25

Where:

- 299 792 458 is the number of meters light travels in one second.
- 60 is the number of seconds in a minute.
- The other 60 is the number of minutes in an hour.
- 24 is the number of hours in a day.
- 365.25 is the number of days in a Julian year.

Q3. Answer: (a)

A **dimensionless quantity** (also known as a bare, pure, or scalar quantity as well as a quantity of dimension one).

It is a quantity to which no physical dimension is assigned, with a corresponding SI unit of measurement of one (or 1), which is not explicitly shown. Dimensionless quantities are widely used in many fields, such as mathematics, physics, chemistry, engineering, and economics. Dimensionless quantities are distinct from quantities that have associated dimensions, such as time (measured in seconds).

Dimensionless units are dimensionless values that serve as units of measurement for expressing other quantities, such as radians (rad) or steradians (sr) for plane angles and solid angles, respectively. For example, the optical extent is defined as having units of metres multiplied by steradians.

HYDROCARBON, ALCOHOL, POLYMER, ORGANIC ACID AND EXPLOSIVE SUBSTANCE

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Q4. Answer: (b)

1. CGS - **centimetre-gram-seconds**

The centimetre–gram–second system of units (abbreviated CGS or cgs) is a variant of the metric system based on the centimetre as the unit of length, the gram as the unit of mass, and the second as the unit of time.

2. SI - **standard international system**

S.I system (standard international system). In this system, the units of mass, length and time are the same, as that of the M.K.S system. However, it is an enlarged system encompassing all fundamental units.

3. MKS - **metre-kilogramme-second**

THE M.K.S. (metre-kilogramme-second) system of units is increasingly being. used by electrical engineers, particularly by those concerned with light-current and microwave work. The adoption of this system into the technical communications of physics and electrical engineering varies considerably.

4. FPS - **foot-pound-second**

The foot-pound-second (fps) system of units is a scheme for measuring dimensional and material quantities. The fundamental units are the foot for length, the pound for weight, and the second for time. The fps system has two variants, known as the American version and the Imperial version.

Q5. Answer: (a)

Since displacement is always less than or equal to distance but never greater than distance.

Hence, the numerical ratio of displacement to the distance covered is always **equal to or less than one**.

Q6. Answer: (b)

Fundamental unit:

The SI unit of a fundamental quantity is called a fundamental unit.

There are 7 fundamental quantities and their fundamental units.
The fundamental quantities are Length, Mass, Time, Electric Current, Thermodynamic Temperature, Luminous Intensity, etc.
?

Fundamental Quantities	
Quantities	**S.I unit**
Mass	Kilogram (kg)
Length	meter (m)
Time	second (s)
Amount of Substance	Mole (mol)
Temperature	Kelvin (K)
Electric Current	Ampere (A)
Luminous intensity	Candela (cd)

Also know,

Fundamental Quantity:

An independent physical quantity that cannot be expressed in terms of other physical quantities is called fundamental quantity.
They are conventionally chosen. It is used as a base to get other derived quantities by combining them.

Supplementary units:

The units that are used along with base units to form derived units in the International System are called supplementary units.

Supplementary Quantities	
Plane angle	radian (rad)
Solid angle	steradian (Sr)
Derived Quantities	
Force	Newton (N)
Work	Joule (J), calorie
Pressure	Pascal (Pa)
Power	Watt (W)

Explanation for the question:

meter (m), kilogram (Kg) and second (s) are the fundamental units of fundamental quantities Length, Mass and Time respectively.

Where Newton (N) is a Derived Quantities.

Q7. Answer: (a)

Q8. Answer: (a)

As already We know that, when a particle is thrown vertically upward with a velocity u from a point A, the particle returns the point A with the same velocity u.

Now, using the fact $v^2=u^2+2gh$, we obtain $v^2=u^2+2g × {12u^2}/{g} ? v^2 = u^2+24u^2$
? v = 5u

Q9. Answer: (d)

Celsius - Unit of Temperature.

Some more examples,

	SI Unit	Other Units
Temperature	Kelvin (K)	Celsius (°C), Fahrenheit (°F)
Heat	Joule (J)	Calorie, British Thermal Unit (BTU)
Sound	Decibel (dB)	
Distance	Meter (m)	Yard, Kilometer, Nautical mile, Mile
Power	Watt (W) or Joule per sec	Ergs/sec, Horsepower (hp)

Q10. Answer: (d)

List I (Physical quantities)	**List-II (Units)**
A. Acceleration	4. Metre/second^2
B. Force	3. Newton
C. Work done	1. Joule
D. Impulse	2. Newton second

Q11. Answer: (b)

Acceleration is the correct answer.

Acceleration Definition:

the act or process of moving faster or happening more quickly: the act or process of accelerating or ability to accelerate

- It is the time rate of change of velocity of a body.
- It is a vector quantity.
- Its SI unit is m/s^2.

The correct explanation for the problem:

When the coin toss, it also has the same velocity as the velocity of the train but during the time, the coin is in the air, the velocity of the train keeps on increasing, and hence it falls behind the passenger.

Definition for other options,

Speed :

Speed is defined as the rate of change of position of an object in any direction. It is measured as the ratio of distance to the time in which the distance was covered. It is a scalar quantity as it has only direction and no magnitude

Deceleration :

A decrease in speed as the body moves away from the starting point is defined as Deceleration. Deceleration is the opposite of acceleration. Deceleration also is known as negative acceleration.

Velocity :

Velocity is the directional speed of an object in motion as an indication of its rate of change in position as observed from a particular frame of reference and as measured by a particular standard of time. Velocity is a fundamental concept in kinematics, the branch of classical mechanics that describes the motion of bodies.

Q12. Answer: (a)

The SI unit of force is the **newton**, symbol N.

Newton :

Newton, an absolute unit of force in the International System of Units (SI units), abbreviated N. It is defined as that force necessary to provide a mass of one kilogram with an acceleration of one metre per second per second.

Faraday :

A faraday is a dimensionless unit of electric charge quantity, equal to approximately 6.02 x 10^{23} electric charge carriers.

Fermi :

Fermi ('unit of measurement') is **an SI unit of length equal to $10^{?15}$ metres**, which means a quadrillionth of one metre. This distance is sometimes called a fermi and was so named in honour of Italian-American physicist Enrico Fermi, as it is a typical length-scale of nuclear physics.

Rutherford :

The rutherford (symbol Rd) is a non-SI unit of radioactive decay. It is defined as the activity of a quantity of radioactive material in which one million nuclei decay per second. It is therefore equivalent to one megabecquerel, and one becquerel equals one microrutherford.

Q13. Answer: (a)

746 watts

A power level of 1 hp is approximately equivalent to 746 watts (W) or 0.746 kilowatts (kW). To convert from horsepower to watts, multiply by 746.

To convert from watts to horsepower, multiply by 0.00134.

Q14. Answer: (a)

The product of velocity and time if, the distance covered represents the area of the shaded portion.

Q15. Answer: (c)

Kilogram or Kilogram Force per Square Centimeter (kg/cm^2 or kgf/cm^2) is a pressure unit that has been largely superseded by the SI unit system of pascal units.

It is the metric equivalent of pounds per square inch (psi). 1 kg/cm^2 equals 98,066.5 pascals.