Physics Questions for CDS, CGL Tier 1 and 10+2 Exams

Physics Quiz 7

Directions: Study the following question carefully and choose the right answer.

1. The force acting on a particle executing simple harmonic motion is

A. Directly proportional to the displacement and is directed away from the mean position.

B. Inversely proportional to the displacement and is directed towards the mean position.

C. Directly proportional to the displacement and is directed towards the mean position.

D. Inversely proportional to the displacement and is directed away from the mean position.

2. As the sunlight passes through the atmosphere, the rays are scattered by tiny particles of dust, pollen, soot and other minute particulate matters present there. However, when we look up, the sky appears blue during mid-day because

A. Blue light is scattered most

B. Blue light is absorbed most

C. Blue light is reflected most

D. Ultraviolet and yellow component of sunlight combine

3. 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. Acceleration B. Deceleration C. Speed D. Velocity

4. The pressure exerted on the ground by a man is greatest

A. When the lies down in the ground

B. When the stands on the toes of one foot

C. When the stands with both foot flat on the ground

D. All of the above yield the same pressure

5. An athlete diving off a high springboard can perform a variety of exercises in the air before entering the water below. Which one of the following parameters will remain constant during the fall?

A. The athlete's linear momentum

B. The athlete's moment of inertia

C. The athlete's kinetic energy

D. The athlete's angular momentum

6. If an object having mass of 1 kg is subjected to a force of 1 N it moves with

A. A speed of 1 m/s B. A speed of 1 km/s C. An acceleration of 10 ms2

D. An acceleration of 1 m/s2

7. The apparent weight of a steel sphere immersed in various liquids is measured using a spring balance. The greatest reading is obtained for the liquid

A. Having the smallest density

B. Having the largest density

C. In which the sphere was submerged deepest

D. Having the greatest volume

8. Raw mangoes shrivel when pickled in brine. The phenomenon is associated with

A. Osmosis B. Reverse osmosis C. Increase of surface tension of fluid

D. Decrease of surface tension of fluid

9. A diffraction pattern is obtained using a beam of red light. Which one among the following will be the outcome, if the red light is replaced by blue light?

A. Bands disappear

B. Diffraction pattern becomes broader and further apart

C. Diffraction pattern becomes narrower and crowded together

D. No change

10. Which one of the following statement is true?

A. Temperatures differing 250 on the Fahrenheit (D) scale must differ by 450 on the Celsius (C) scale

B. 00 F corresponds to – 320 C

C. Temperatures which differ by 100 on the Celsius scale must differ by 180 on the Fahrenheit scale

D. Water at 90 0 C is warmer than water at 2020 F

Correct Answers:

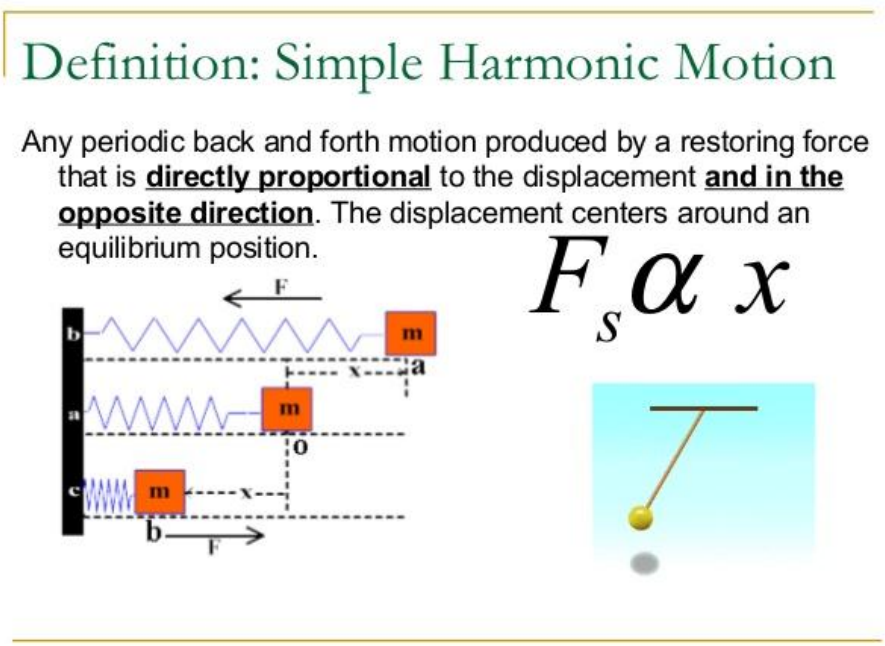
1	2	3	4	5	6	7	8	9	10
C	A	A	B	D	D	C	A	A	C

Explanations:

1.

When a particle executes simple harmonic motion, and then it has the following three characteristics:

1. The motion of particle is to and fro about a fixed point, called equilibrium position.
2. The restoring force (acceleration) acting on the particle is always proportional to the displacement of the particle from the equilibrium position.
3. The force (or acceleration) is always directed towards the equilibrium position.



2.

When sunlight enters the Earth's atmosphere, the atoms or molecules of the gases present in atmosphere scatter this light, since, wavelength of red colour is larger than the wavelengths of other colours in sunlight, so it scattered least. The violet colour scattered most followed by blue, green, yellow, orange and red colours. Our eye is more sensitive to the blue light than the violet light. So, the scattered light in the sky contains blue colour in plenty and therefore sky appears blue.

3.

As the coin falls behind the passenger, so the train must be moving with a uniform acceleration. As the passenger tosses the coin, it goes up and is in motion with the speed (initial) of the train but the train is accelerated, so its speed increases. But the coin is in the initial speed in the air, so the train slightly moves forward from the coin with the person and coin falls behind him.

4.

When a man stands on the toes of one foot on the ground, then he exerts greatest pressure on the ground because pressure is normal force per unit area, therefore, for lesser value of area pressure is greatest.

5.

When a diver jumps from the spring board, he curls his body by rolling his arms and legs in. By doing so, he decreases his moment of inertia and hence angular speed increases to conserve the angular momentum.

6.

The magnitude of force is given by

$f = ma$ or $a = f/m$

Here, $F = 1\ N = 1\ kg \cdot m/s^2$

and $m = 1\ kg$

So $a = f/m = 1\ kg \cdot m/s^2/1\ kg$

Acceleration (a) = 1 m/s^2

7.

When a body immersed in a liquid, then the apparent weight of the body depends upon the densities of the liquid and body also on the volume of the solid and volume of the portion of the solid immersed in liquid. So, the apparent weight of a steel sphere will be greatest for the liquid in which the sphere was submerged deepest.

8.

Raw mangoes shrivel when pickled in brine due to osmosis. Osmosis is the process in which water molecules from a region of higher concentration moves towards to a region of lower concentration through a semi-permeable membrane. Because of this phenomenon, raw mangoes shrivel when pickled in brine.

9.

In diffraction pattern, band width wavelength. Since, the wavelength of red light is greater than the blue light, so the width of red band is wider. If blue light is used in place of red light than the bands disappear.

10.

By the relation in different scales, from the given statements,

Temperature which differs by 100 on the Celsius scale must differ by 180 on the Fahrenheit scale.