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

Physics Quiz 4

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

1. One kilowatt hour is equal to

- A. 3.6 Mega Joule B. 3.8 Mega Joule C. 3.2 Mega Joule D. 4.0 Mega Joule

2. On which of the following techniques photo state machine works?

- A. Magnetic Image Making
B. Thermal Image Making
C. Electrostatic Image Making
D. Electromagnetic Image Making

3. Rain drops fall from great height. Which among the following statements is true regarding it?

- A. They fall with that ultimate velocity, which are different for different droplets
B. They fall with same ultimate velocity
C. Their velocity increases and they fall with different velocity on earth
D. Their velocity increases and they fall with same velocity on the earth

4. The mass of a star is two time the mass of the Sun. How will it come to an end?

- A. Neutron Star B. Black hole C. White Dwarf D. Red Giant

5. Why the needle of iron swims on water surface when it is kept gently?

- A. It will remain under the water, when it will displace more water than its weight.
- B. The more density of needle is less than that of water.
- C. Due to surface tension
- D. Due to its change

6. If the diameter of capillary is doubled, then the rise of water in it will be

- A. Two times
- B. Half
- C. Four times
- D. No change

7. When a ring of metal is heated what happens to its hole?

- A. Expands
- B. Contracts
- C. It expands and contracts according to its diameter
- D. It expands and contracts according to its coefficient of expansion

8. Which among the following is the fundamental quantity?

- A. Volume
- B. Time
- C. Velocity
- D. Force

9. When the speed of car is doubled, then what will be braking force of the car to stop it in the same distance?

- A. Four times
- B. Two times
- C. Half
- D. One fourth

10. What is found in frequency modulation?

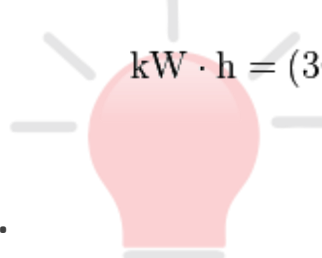
- A. Fixed frequency
- B. Fixed dimension
- C. Change in frequency and dimension
- D. Change in dimension only

Correct Answers:

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

Explanations:**1.**

The energy 1 kilowatt-hour (kWh) is 3600000 joule or 3.6 mega joule. In physics, energy is an indirectly observed quantity that is often understood as the ability of a physical system to do work on other physical system. However, this must be understood as an overly simplified definition, as the law of thermodynamics demonstrates that not all energy can perform work.


$$\text{kW} \cdot \text{h} = (3600\text{s})[\text{kW}] = 3600 [\text{s}] \left[\frac{\text{kJ}}{\text{s}} \right] = 3600\text{kJ} = 3.6 \text{ MJ}$$

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2.

All Electrostatics copiers work under the premise that a charge of electricity is placed on an Image Drum which has the ability to retain the electric charge much like a capacitor holds its charge but with the ability to hold or release the charge depending on how much light and darkness is applied to the Image Drum. A photocopier is a machine that makes paper copies of documents and other visual images quickly and cheaply. Most current photocopiers use a technology called xerography, a dry process using heat. Copiers can also use other technologies such as ink jet. But xerography is standard for office coping.

3.

A mass is attracted to the Earth by the pull of gravity. Gravity accelerates all objects towards the ground at a specific rate. Without any other forces present, the speed of an object in free fall will increase the farther or longer it falls. In general the air resistance on an object depends upon the shape of the object. Its shape determines the object's drag coefficient: the more aerodynamic the shape, the less drag. Second,

it depends upon the size of the object: specifically the cross sectional area presented to the airflow (perpendicular to the direction of travel). And lastly, it depends upon the speed of the object. At the low speeds the object's resistance is directly proportional to speed, and at higher speeds the object's resistance is proportional to its speed squared. Most objects falling through the air would be considered to be moving at a higher speed. Even though that speed might not be great compare to some velocities.

4.

The mass of a star which is two times the mass of sun turns into a Neutron Star. A neutron star is a type of stellar remnant that can result from the gravitational collapse of a massive star during a Type II, Type Ib or Type Ic supernova event. Such stars are composed almost entirely of neutrons. Which are subatomic particles of without electrical charge and with slightly larger mass than protons. Neutron stars are very hot and are supported against further collapse by quantum degeneracy pressure due to the Pauli's exclusion principle. This principle states that no two neutrons (or any other fermionic particles) can occupy the same place and quantum state simultaneously. A typical neutron star masses (Chandrasekhar Limit), with a corresponding radius of about 12 km if the Akmal Pandharipande Ravenhall equation of state (APR EOS) is used.

5.

According to Archimedes principle and we can note that the amount of water displaced by a needle is lesser than the amount of water moved out by the needle (that is displaced of the needle). So the needle initially stays on the surface of water and then sinks into the water. Surface tension is a contractive tendency of the surface of a liquid that allows it to resist an external force. It is revealed, for example, in the floating of some objects on the surface of water, even though they are denser than water, and in the ability of some insects (e.g. water striders) to run on the water surface. This property is caused by cohesion of similar molecules, and is responsible for many of the behaviors of liquids.

6.

Radius of a capillary tube is inversely proportional to the height of the liquid column. So, if radius of the tube is doubled, rise of level of water will become half of the previous rise in capillary tube. Capillary action or capillarity is the ability of a liquid to flow in narrow spaces without the assistance of and in opposition to external forces like gravity. The effect can be seen in the drawing up of liquids between the hairs of paint brush, in a thin tube, in porous materials such as paper, in some non porous materials such as liquefied carbon fiber, or in a cell. It occurs because of inter molecular attractive forces between the liquid and solid surrounding surfaces.

7.

The hole size of ring will increase because in expansion the size between two molecules do not increase so when the molecules on the outer edge move outwards. Due to expansion, the size of the hole will also increase so as to compensate the distance change between the molecules. Thermal expansion is the tendency of matter to change in volume in response to a change in temperature. When a substance is heated, its particles begin moving more and thus usually maintain a greater average separation.

8.

The fundamental quantities of Physics are the seven basic quantities that can be used to express all other physical quantities. These are as follows: Length: Meter, Heat : Kelvin, Time : Second, Luminous Intensity : Candela, Mass : Kilogram, Electric current : Ampere and Amount of substance : Moles.

9.

Brake force, also known as Brake Power, is a measure of breaking power of vehicle. Suppose a car whose mass is 'x' and is braked from a speed of y km/hr to come to halt at uniform retardation in z minute. If the speed of the car is doubled in the same distance, then the braking force required to stop the car is four times the original speed i.e. '4v'. note that all the parameters remain to be same.

10.

Frequency Modulation (FM) conveys information over a carrier wave by varying its instantaneous frequency. This contrasts with amplitude modulation, in which the amplitude of the carrier is varied while its frequency remains constant. Frequency modulation is also used in telemetry, radar, seismic prospecting and newborn EEG seizure monitoring. Frequency modulation is known as phase modulation when the carrier phase modulation is the time integral of the PM signal. PM is widely used for broadcasting music and speech, two way radio systems, magnetic tape recording systems and some video transmission systems.



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