MCQs for: Physics

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Total Questions: 10

1. Question Download Solution PDF The 'theory of relativity' is presented by which scientist? This question was previously asked in 67th BPSC Prelims Set - D (Re-Exam) 30 Sept 2022 Official Paper Download PDF Attempt Online View all BPSC Exam Papers > Isaac Newton Stephen Hawking Marie Curie Albert Einstein None of the above/More than one of the above

A. Isaac Newton

B. Stephen Hawking

C. Marie Curie

D. Albert Einstein

E. None of the above/More than one of the above

Answer & Solution:

The correct answer is Albert Einstein. Key Points Relativity is a theorem, formulated by Albert Einstein, which states that space and time are relative and all the motion must be relative to a frame of reference. It is a notion that states, laws of physics are the same everywhere. This theory is simple but hard to understand. It states There is no absolute reference frame, if the object or momentum is only in relation to other objects, then velocity can be measured. The speed of light is constant irrespective of who measures it or how fast the person measuring it, is moving. Albert Einstein's Theory of Relativity encompasses two theories, namely special relativity theory and general relatively Theory. Special Theory of Relativity: Einstein first introduced this term in the year 1905. It is a theorem that deals with the structure of space-time. Einstein explained this theory based on two postulates. The laws of physics are the same for all irrespective of the velocity of the observer. The speed of light is always constant regardless of the motion of the light source or the motion of the observer. General Theory of Relativity: General relativity theory developed by Einstein in the year 1907-1915 states that being at rest in the gravitational field and accelerating is identical physically. For example, an observer can see the ball the same way on the rocket and on Earth. This is due to the acceleration of the rocket, which is equal to 9.8 m/s2. This theory relates to Newton's gravitational theory and special relativity. Gravitational Time dilation: Gravity influences the passage of time. Clocks in the deeper gravitational wells run slower than in general gravitational levels. Light rays will bend in the gravitational field. The universe is expanding, and parts of it are moving away from Earth faster than the speed of light. Download Solution PDF Share on Whatsapp

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2. Question Download Solution PDF Who is the first person to define speed? This question was previously asked in 67th BPSC Prelims Set - D (Re-Exam) 30 Sept 2022 Official Paper Download PDF Attempt Online View all BPSC Exam Papers > Newton Kepler Ptolemy Galileo None of the above/More than one of the above

A. Newton

B. Kepler

C. Ptolemy

D. Galileo

E. None of the above/More than one of the above

Answer & Solution:

The correct answer is Galileo. Key Points The Italian physicist Galileo Galilei is credited with being the first to measure speed. Galileo defined speed as the distance covered per unit of time. The speed of an object is the magnitude of the change of its position over time or the magnitude of the change of its position per unit of time; it is thus a scalar quantity. Additional Information Isaac Newton He is known as the "Father of Physics". He is well known for his discoveries in optics (white light composition) and mathematics (calculus) He formulated the three laws of motion—the basic principles of modern physics. His formulation of the laws of motion resulted in the law of universal gravitation. Kepler: Johannes Kepler created three laws of planetary motion. The path of the planets about the sun is elliptical in shape, with the centre of the sun being located at one focus. (The Law of Ellipses) An imaginary line drawn from the centre of the sun to the centre of the planet will sweep out equal areas in equal intervals of time. (The Law of Equal Areas) The ratio of the squares of the periods of any two planets is equal to the ratio of the cubes of their average distances from the sun. (The Law of Harmonies) Download Solution PDF Share on Whatsapp

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3. Question Download Solution PDF An effective Coriolis force results from This question was previously asked in 67th BPSC Prelims Held on 8 May 2022 Official Question Paper Download PDF Attempt Online View all BPSC Exam Papers > solar system earth rotation interior of the earth Colorado and Gulf Streams None of the above/More than one of the above

A. solar system

B. earth rotation

C. interior of the earth

D. Colorado and Gulf Streams

E. None of the above/More than one of the above

Answer & Solution:

The correct answer is option 2. Key Points Coriolis force: The rotation of the earth about its axis affects the direction of the wind and this force is called the Coriolis force. It is directly proportional to the angle of latitude. It deflects the wind to the left direction in the southern hemisphere and the right direction in the northern hemisphere. Coriolis force deflects surface currents At an angle of about 45 degrees to the wind to the right in the Northern Hemisphere and left in the Southern Hemisphere. It is maximum at the poles and is absent at the equator. The force acts perpendicular to the pressure gradient force. The Coriolis force is zero at the equator and the wind blows perpendicular to the isobars. Major surface ocean currents in the open ocean, however, are set in motion by the wind, which drags on the surface of the water as it blows. The winds pull surface water with them, creating currents. As these currents flow westward, the Coriolis effect, a force that results from the rotation of the Earth, deflects them. Download Solution PDF Share on Whatsapp

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4. Question Download Solution PDF When a soap film on the water is seen in the daytime, it shows beautiful colors. This phenomenon is due to This question was previously asked in 67th BPSC Prelims Held on 8 May 2022 Official Question Paper Download PDF Attempt Online View all BPSC Exam Papers > diffraction of light refraction of light polarization of light interference of light None of the above/More than one of the above

A. diffraction of light

B. refraction of light

C. polarization of light

D. interference of light

E. None of the above/More than one of the above

Answer & Solution:

The correct answer is an interference of light. CONCEPT: When light shines onto a bubble it seems to change colour. Not like those seen during a rainbow, which arises from differential refraction, the colours are seen during a soap bubble that arises from interference of light reflecting off the front and back surfaces of the thin film. Interference is a natural phenomenon that happens at every place and at every moment. Interference is the phenomenon in which two waves superpose to form the resultant wave of the lower, higher, or same amplitude. The most commonly seen interference is an optical interference or light interference. This is because light waves are randomly generated every which way by most sources. This means that light waves coming out of a source do not have a constant amplitude, frequency, or phase. The most common example of interference of light is the soap bubble which reflects wide colours when illuminated by a light source. Additional Information Scattering, in physics, is a change in the direction of motion of a particle because of a collision with another particle. In optics, dispersion is the phenomenon in which the phase velocity of a wave depends on its frequency. Polarization is a property applying to transverse waves that specify the geometrical orientation of the oscillations. Download Solution PDF Share on Whatsapp

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5. Question Download Solution PDF If a feather, a rubber ball, and a wooden ball are falling freely simultaneously from the same height in a vacuum, then This question was previously asked in 67th BPSC Prelims Held on 8 May 2022 Official Question Paper Download PDF Attempt Online View all BPSC Exam Papers > the feather will reach at the ground first the rubber ball will reach at the ground first the wooden ball will reach at the ground first all the three will reach at the ground together None of the above/More than one of the above

A. the feather will reach at the ground first

B. the rubber ball will reach at the ground first

C. the wooden ball will reach at the ground first

D. all the three will reach at the ground together

E. None of the above/More than one of the above

Answer & Solution:

The correct option is all the three will reach the ground together. CONCEPT: A fall is considered a free fall if the only force acting on it was gravity. As the vacuum contains no matter, there is no opposite force against the free fall due to gravity. In air and atmosphere, there is aerodynamic drag and in the sea, there is a buoyancy force of water to oppose the movement due to gravity. EXPLANATION: The time required to hit the ground for all the three balls depends on only gravitational acceleration (g) which is the same for all the three balls because there is no air resistance present in a vacuum. It is the condition of free fall so, If a feather, a rubber ball, and a wooden ball are falling freely simultaneously from the same height in a vacuum, then all the three will reach the ground together Download Solution PDF Share on Whatsapp

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6. Question Download Solution PDF A fan produces a feeling of comfort during the hot weather because This question was previously asked in 67th BPSC Prelims Held on 8 May 2022 Official Question Paper Download PDF Attempt Online View all BPSC Exam Papers > fan supplies cool air our body radiates more heat in air conductivity of air increases our perspiration evaporates rapidly None of the above/More than one of the above

A. fan supplies cool air

B. our body radiates more heat in air

C. conductivity of air increases

D. our perspiration evaporates rapidly

E. None of the above/More than one of the above

Answer & Solution:

The correct option is our perspiration evaporates rapidly. CONCEPT: Demonstrates the heat transfer mechanism in the human body: Perspiration is basically sweating which occurs in the human body because of the sweat glands present under the skin. Radiation is only dependent on the absolute Temperature it has nothing to do with air or without air, the intensity of radiation remains the same. A fan in a room circulates the air which is present inside the room, it never provides cooler or warmer air rather it provides the air at the room temperature. The conductivity of air is a function of temperature so a sole fan can never change the temperature of the air as we know fan only circulates the air at the room temperature thus conductive doesn't change by the virtue of the fan. The process by which the human body gives off heat (Tambient < Tskin): The process by which the human body receives heat (Tambient > Tskin): When the ambient temperature is above body temperature, then radiation, conduction, and convection all transfer heat into the body rather than out. Since there must be a net outward heat transfer, the only mechanisms left under those conditions are the evaporation of perspiration from the skin and the evaporative cooling from exhaled moisture. If part of a liquid evaporates, it cools the liquid remaining behind because it must extract the necessary heat of vaporization from that liquid in order to make the phase change to the gaseous state. It is, therefore, an important means of heat transfer in certain circumstances, such as the cooling of the human body when it is subjected to ambient temperatures above the normal body temperature. EXPLANATION: A fan produces a feeling of comfort during hot weather because our perspiration evaporates rapidly. Perspiration is basically sweating which

occurs in the human body because of the sweat glands present under the skin. Due to the warm weather condition, we sweat. Now as the sweat comes out it spreads over the skin, this sweat evaporates under the action of the fan blowing the air which results in effective convection thus taking away the heat from the skin resulting in the cooling effect. Download Solution PDF Share on Whatsapp

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7. Question Download Solution PDF What is the ‘Manhattan Project’? This question was previously asked in 69th BPSC Prelims Exam Official Paper (Held On: 30 Sept, 2023) Download PDF Attempt Online View all BPSC Exam Papers > A research and development undertaking that produced the first nuclear weapons One of the largest art auctions of the world A real estate project in New York City A famous theme park

A. A research and development undertaking that produced the first nuclear weapons

B. One of the largest art auctions of the world

C. A real estate project in New York City

D. A famous theme park

Answer & Solution:

The correct answer is Option 1. Key Points The "Manhattan Project" was a top-secret research and development project undertaken during World War II by the United States, the United Kingdom, and Canada. The Manhattan Project was initiated in 1939, shortly after the outbreak of World War II, in response to concerns that Nazi Germany might develop atomic weapons. Its primary goal was to develop the world's first atomic bomb, a powerful and devastating weapon that relied on nuclear fission to release an immense amount of energy. The project was named the Manhattan Project because much of the early research took place in Manhattan, New York. Prominent scientists like J. Robert Oppenheimer, Enrico Fermi, and Richard Feynman were involved in the project, and they made significant scientific and engineering breakthroughs. The project culminated in the successful test of an atomic bomb, codenamed "Trinity," on July 16, 1945, in New Mexico. Subsequently, two atomic bombs were dropped on the Japanese cities of Hiroshima and Nagasaki in August 1945, leading to Japan's surrender and the end of World War II. The Manhattan Project is a pivotal chapter in the history of science, technology, and warfare, and it played a crucial role in the development of the Cold War and the subsequent proliferation of nuclear weapons. Download Solution PDF Share on Whatsapp

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8. Question Download Solution PDF Due to temperature variation along a conductor, potential variation occurs along it. This phenomenon is known as This question was previously asked in 67th BPSC Prelims Set - D (Re-Exam) 30 Sept 2022 Official Paper Download PDF Attempt Online View all BPSC Exam Papers > Joule effect Seebeck effect Peltier effect Thomson effect None of the above/More than one of the above

A. Joule effect

B. Seebeck effect

C. Peltier effect

D. Thomson effect

E. None of the above/More than one of the above

Answer & Solution:

The correct answer is Thomson effect. Key Points Thomson effect Thomson effect is the evolution or absorption of heat when an electric current passes through a circuit composed of a single material that has a temperature difference along its length. Seebeck Effect In Seebeck Effect, a temperature difference between two dissimilar electrical conductors produces a potential difference across the junctions of the two different metals. The cause of this potential difference is the diffusion of free electrons from a high electron-density region to a low electron-density region. Download Solution PDF Share on Whatsapp

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9. Question Download Solution PDF The slogan 'Do or Die' was given by This question was previously asked in 45th BPSC Prelims (Held in 2002) Official paper Download PDF Attempt Online View all BPSC Exam Papers > PC Roy JC Bose CV Raman Mahatma Gandhi

A. PC Roy

B. JC Bose

C. CV Raman

D. Mahatma Gandhi

Answer & Solution:

The correct answer is Mahatma Gandhi Key Points Mahatma Gandhi Mahatma Gandhi was a great thinker, social reformer, and nationalist. He preached the idea of Truth and Nonviolence. The Champaran agitation in 1917 in Bihar was Gandhi's first active involvement in Indian freedom politics. The Champaran farmers were being forced to grow Indigo and were being tortured if they protested. He called on many national movement time from to time in the struggle for Independence as the Khilafat Movement(1919), Noncooperation Movement(1920), Civil Disobedience Movement(1930), and Quit India Movement(1942). The famous slogan 'Do or Die' was given by him in Quit India Movement. Gandhi ji established various ashrams like Phoneix, Sabarmati, Wardha, etc. He also contributed to the literature by writing many journals, magazines, books, etc. His famous literary work is his autobiography 'My Experiment with Truth'. Additional Information Jagdish Chandra Bose He was a famous Indian Scientist born on 30 Nov 1858. He was the first to prove that plants too have feelings. He invented an instrument 'Crescograph' to record the pulse of plants and connected it to a plant. Bose would go on to demonstrate that plants could respond to various stimuli, including light, fertilizer, and various poisons and toxins. Chandrashekhar Venkata Raman Chandrasekhara Venkata Raman was born at Tiruchirappalli in Southern India on November 7th, 1888. His earliest research in optics and acoustics – the two fields of investigation to which he has dedicated his entire career. He explained Raman and Rayleigh Scattering for this contribution he received Nobel Prize in Physics in 1930.

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10. Question Download Solution PDF Shrillness of sound is determined by This question was previously asked in 68th BPSC Prelims (Held on 12 Feb 2023) (Set: B) - Official Paper Download PDF Attempt Online View all BPSC Exam Papers > velocity of sound amplitude of sound wavelength of sound More than one of the above None of the above

A. velocity of sound

B. amplitude of sound

C. wavelength of sound

D. More than one of the above

E. None of the above

Answer & Solution:

The correct answer is None of the above Confusion Points It is true that the shrillness of sound is determined by its frequency but frequency and wavelength are inversely proportionate. So, it is also true to say that the shrillness of sound depends on its wavelength. Since frequency and wavelength are inseparably interlinked (velocity= wavelength x frequency and velocity are constant in a medium). Key Points The Shrillness of the sound is determined by the frequency of the vibration. High-pitched noises can be characterized as having a shrill quality. We describe a sound as being harsh and having a higher pitch if the vibration frequency is higher. Low pitch is a description of a sound whose vibration frequency is lower. Pitch can be thought of as the unit of measurement for sound frequency expressed in Hertz. The velocity of Sound: The distance that sound energy will travel through that material in a specific amount of time. It depends on the material's density, acoustic impedance, and temperature. The amplitude of Sound: The height of a sound wave is quantified by its amplitude. The loudness or the maximum displacement of vibrating medium particles from their mean position at the time the sound is produced. Wavelength of Sound: The distance separating two wave crests or troughs that occur consecutively.
