Question No : 1 of 43 **Marks: 1 (Budgeted Time 1 Min)**

The prefix "mega" means

Answer (Please select your correct option)

- 10^{2}
- 10^{9}
- 10^{-3}
- 10^{6}
- 10^{-6}

Correct answer solved by Hadi
Email : usmanraj20@gmail.com
Cell no: 03228043306
Made by: Waqar Siddhu

Question No : 2 of 43 **Marks: 1 (Budgeted Time 1 Min)**

Two bodies are falling with negligible air resistance, side by side, above a horizontal plane. If one of the bodies is given an additional horizontal acceleration during its descent, it:

Answer (Please select your correct option)

- strikes the plane at the same time as the other body
- strikes the plane earlier than the other body
- has the vertical component of its velocity altered
- has the vertical component of its acceleration altered

Correct answer solved by Hadi
Email : usmanraj20@gmail.com
Cell no: 03228043306

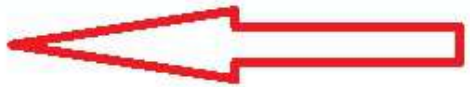
Made by: Waqar Siddhu

Question No : 3 of 43 **Marks: 1 (Budgeted Time 1 Min)**

An object moves in a circle at constant speed. The work done by the centripetal force is zero because:

Answer (Please select your correct option)

- the displacement for each revolution is zero
- the average force for each revolution is zero
- there is no friction
- the centripetal force is perpendicular to the velocity



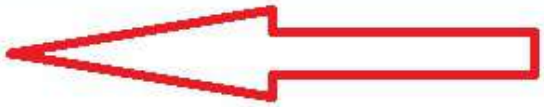
Made by: Waqar Siddhu

Question No : 4 of 43 **Marks: 1 (Budgeted Time 1 Min)**

Two bodies, A and B, have equal kinetic energies. The mass of A is nine times that of B. The ratio of the momentum of A to that of B is:

Answer (Please select your correct option)

- 1:9
- 1:3
- 1:1
- 3:1



Made by: Waqar Siddhu

Question No : 5 of 43 **Marks: 1 (Budgeted Time 1 Min)**

Ten seconds after an electric fan is turned on, the fan rotates at 300 rev/min. Its average angular acceleration is:

Answer (Please select your correct option)

- 3.14 rad/s2
- 30 rad/s2
- 30 rev/s2
- 50 rev/min2
- 1800 rev/s2

Ans:

$$t = 10\ s\ ;\ \omega_0 = 0;\ \ w = 300\ rev/min = \frac{300 \times 2\pi}{60} rad/sec = 31.41\ rad/s$$

$$\alpha_{avg} = \frac{\Delta\omega}{\Delta t} = \frac{\omega \quad \omega_0}{10} = \frac{31.41}{10} = 3.14\ rad/s^2$$

Correct answer solved by Hadi
Email : usmanraj20@gmail.com
Cell no: 03228043306

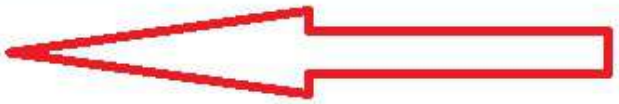
Made by: Waqar Siddhu

Question No : 6 of 43 **Marks: 1 (Budgeted Time 1 Min)**

In simple harmonic motion, the restoring force must be proportional to the:

Answer (Please select your correct option)

- amplitude
- frequency
- velocity
- displacement



Made by: Waqar Siddhu

Question No : 7 of 43 **Marks: 1 (Budgeted Time 1 Min)**

The center of gravity coincides with the center of mass:

Answer (Please select your correct option)

- always
- never
- if the center of mass is at the geometrical center of the body
- if the acceleration due to gravity is uniform over the body

Email : usmanraj20@gmail.com
Cell no: 03228043306

Made by: Waqar Siddhu

Question No : 8 of 43 **Marks: 1 (Budgeted Time 1 Min)**

The ultimate strength of a sample is the stress at which the sample:

Answer (Please select your correct option)

- returns to its original shape when the stress is removed
- remains underwater
- breaks
- bends 180.

Correct answer solved by Hadi
Email : usmanraj20@gmail.com
Cell no: 03228043306

Made by: Waqar Siddhu

Question No : 9 of 43 **Marks: 1 (Budgeted Time 1 Min)**

The units of the electric field are:

Answer (Please select your correct option)

- J/m
- J/(C·m)
- J/C
- J·C

Correct answer solved by Hadi
Email : usmanraj20@gmail.com
Cell no: 03228043306

Made by: Waqar Siddhu

Question No : 10 of 43 **Marks: 1 (Budgeted Time 1 Min)**

If 500 J of work is required to carry a charged particle between two points with a potential difference of 20V, the magnitude of the charge on the particle is:

Answer (Please select your correct option)

- 0.040C
- 12.5C
- 20C
- Can not be computed unless the path is given

Correct answer solved by Hadi
Email : usmanraj20@gmail.com
Cell no: 03228043306

Made by: Waqar Siddhu

Question No : 11 of 43 **Marks: 1 (Budgeted Time 1 Min)**

Let Q denote charge, V denote potential difference, and U denote stored energy. Of these quantities, capacitors in parallel must have the same

Answer (Please select your correct option)

- Q only
- V only
- U only
- Q and U only

Correct answer solved by Hadi
Email : usmanraj20@gmail.com
Cell no: 03228043306

Made by: Waqar Siddhu

Question No : 12 of 43 **Marks: 1 (Budgeted Time 1 Min)**

A magnetic field exerts a force on a charged particle:

Answer (Please select your correct option)

- always
- never
- if the particle is moving across the field lines
- if the particle is moving along the field lines

Email : usmanraj20@gmail.com
Cell no: 03228043306

Made by: Waqar Siddhu

Question No : 13 of 43 **Marks: 1 (Budgeted Time 1 Min)**

The units of magnetic dipole moment are:

Answer (Please select your correct option)

- ampere
- ampere·meter
- ampere·meter^2
- ampere/meter

Correct answer solved by Hadi
Email : usmanraj20@gmail.com
Cell no: 03228043306

Made by: Waqar Siddhu

Question No : 14 of 43 **Marks: 1 (Budgeted Time 1 Min)**

A capacitor in an LC oscillator has a maximum potential difference of 15V and a maximum energy of 360 μJ. At a certain instant the energy in the capacitor is 40 μJ. At that instant what is the en
induced in the inductor?

Answer (Please select your correct option)

- zero
- 5V
- 10V
- 15V

Correct answer solved by Hadi
Email : usmanraj20@gmail.com
Cell no: 03228043306

Made by: Waqar Siddhu

Question No : 15 of 43 **Marks: 1 (Budgeted Time 1 Min)**

The relation $n_1 \sin q_1 = n_2 \sin q_2$ is known as _____.

Answer (Please select your correct option)

- Gauss's Law
- Snell's Law
- Faraday's Law
- Fermat's Law

Correct answer solved by Hadi
Email : usmanraj20@gmail.com
Cell no: 03228043306

Made by: Waqar Siddhu

Question No : 16 of 43 **Marks: 1 (Budgeted Time 1 Min)**

Following are the ways by which light can interact with matter, EXCEPT:

Answer (Please select your correct option)

- Emission
- Interference
- Absorption
- Transmission

Correct answer solved by Hadi
Email : usmanraj20@gmail.com
Cell no: 03228043306

Made by: Waqar Siddhu

Question No : 17 of 43 **Marks: 1 (Budgeted Time 1 Min)**

Polarization means _____.

Answer (Please select your correct option)

- To guide the light in only one direction
- To change the frequency of the light
- To alter the wavelength of the light
- To separate the light into its colors

Correct answer solved by Hadi
Email : usmanraj20@gmail.com
Cell no: 03228043306

Made by: Waqar Siddhu

Question No : 18 of 43 **Marks: 1 (Budgeted Time 1 Min)**

Waves from two slits are in phase at the slits and travel to a distant screen to produce the third side maximum of the interference pattern. The difference in the distance traveled by the waves is:

Answer (Please select your correct option)

- half a wavelength
- a wavelength
- two wavelengths
- three wavelengths

Email : usmanraj20@gmail.com
Cell no: 03228043306

Made by: Waqar Siddhu

Question No : 19 of 43 **Marks: 1 (Budgeted Time 1 Min)**

Which of the following electromagnetic radiations has photons with the greatest energy?

Answer (Please select your correct option)

- blue light
- yellow light
- x rays
- radio waves

Correct answer solved by Hadi
Email : usmanraj20@gmail.com
Cell no: 03228043306

Made by: Waqar Siddhu

Question No : 20 of 43 **Marks: 1 (Budgeted Time 1 Min)**

Which of the following electromagnetic radiations has photons with the greatest momentum?

Answer (Please select your correct option)

- x rays

Correct answer solved by Hadi
Email : usmanraj20@gmail.com
Cell no: 03228043306

- radio waves
- blue light
- yellow light

Made by: Waqar Siddhu

Question No : 21 of 43 **Marks: 1 (Budgeted Time 1 Min)**

If h is the Planck constant, then ħ is:

Answer (Please select your correct option)

- h/2π

Correct answer solved by Hadi
Email : usmanraj20@gmail.com
Cell no: 03228043306

- h/2
- h/π
- 2h/π

Made by: Waqar Siddhu

Question No : 22 of 43 **Marks: 1 (Budgeted Time 1 Min)**

A basic postulate of Einstein's theory of relativity is:

Answer (Please select your correct option)

- moving clocks run more slowly than when they are at rest
- moving rods are shorter than when they are at rest
- light has both wave and particle properties
- the laws of physics must be the same for observers moving with uniform velocity relative to each other

Made by: Waqar Siddhu

Question No : 23 of 43 **Marks: 1 (Budgeted Time 1 Min)**

Two events occur simultaneously on the x axis of reference frame S, one at $x = -a$ and the other at $x = +a$. According to an observer moving in the positive x direction:

Answer (Please select your correct option)

- the event at $x = +a$ occurs first

Correct answer solved by Hadi
Email : usmanraj20@gmail.com
Cell no: 03228043306

- the event at $x = -a$ occurs first
- either event might occur first, depending on the value of a and the observer's speed
- the events are simultaneous

Made by: Waqar Siddhu

Question No : 24 of 43 **Marks: 1 (Budgeted Time 1 Min)**

How fast should you move away from a 6.0×10^{14} Hz light source to observe waves with a frequency of 4.0×10^{14} Hz?

Answer (Please select your correct option)

- 20c
- 38c
- 45c
- 51c

Correct answer solved by Hadi
Email : usmanraj20@gmail.com
Cell no: 03228043306

Made by: Waqar Siddhu

Question No : 25 of 43 **Marks: 1 (Budgeted Time 1 Min)**

In a photoelectric effect experiment at a frequency above cut off, the stopping potential is proportional to:

Answer (Please select your correct option)

- the energy of the least energetic electron before it is ejected
- the energy of the most energetic electron before it is ejected
- the energy of the most energetic electron after it is ejected
- the electron potential energy at the surface of the sample

Email : usmanraj20@gmail.com
Cell no: 03228043306

Made by: Waqar Siddhu

Question No : 26 of 43 **Marks: 1 (Budgeted Time 1 Min)**

In Compton scattering from stationary particles the maximum change in wavelength can be made smaller by using:

Answer (Please select your correct option)

- less massive particles
- higher frequency radiation
- lower frequency radiation
- more massive particles

Email : usmanraj20@gmail.com
Cell no: 03228043306

Made by: Waqar Siddhu

Question No : 27 of 43 **Marks: 1 (Budgeted Time 1 Min)**

A free electron and a free proton have the same kinetic energy. This means that, compared to the matter wave associated with the proton, the matter wave associated with the electron has:

Answer (Please select your correct option)

- a shorter wavelength and a greater frequency
- a longer wavelength and a greater frequency
- a shorter wavelength and the same frequency
- a longer wavelength and the same frequency

Email : usmanraj20@gmail.com
Cell no: 03228043306

Made by: Waqar Siddhu

Question No : 28 of 43 **Marks: 1 (Budgeted Time 1 Min)**

A large collection of nuclei are undergoing alpha decay. The rate of decay at any instant is proportional to:

Answer (Please select your correct option)

- the number of undecayed nuclei present at that instant
- the time since the decays started
- the time remaining before all have decayed
- the half-life of the decay

Correct answer solved by Hadi
Email : usmanraj20@gmail.com
Cell no: 03228043306

Made by: Waqar Siddhu

Question No : 29 of 43 **Marks: 1 (Budgeted Time 1 Min)**

The inner most part of the Sun is known as

Answer (Please select your correct option)

- Convection zone
- Core
- Radiation zone
- Nucleus

Correct answer solved by Hadi
Email : usmanraj20@gmail.com
Cell no: 03228043306

Made by: Waqar Siddhu

Question No : 30 of 43 **Marks: 1 (Budgeted Time 1 Min)**

The centre of gravity is the average location of the …… of an object

Answer (Please select your correct option)

- mass
- weight
- static equilibrium
- dynamic

Correct answer solved by Hadi
Email : usmanraj20@gmail.com
Cell no: 03228043306

Made by: Waqar Siddhu

Question No : 31 of 43 **Marks: 2 (Budgeted Time 4 Min)**

Why does the pressure of gas enclosed in a rigid container increase as the temperature increases?

Answer (Please click here to Add Answer)

Ans. On average, the molecules of a higher temperature substance are moving faster and impart a greater force per unit area to the walls of the container as they randomly collide with it.

Made by: Waqar Siddhu

Question No : 32 of 43 **Marks: 2 (Budgeted Time 4 Min)**

When green light shines on a rose, why do the petals look black?

Answer (Please click here to Add Answer)

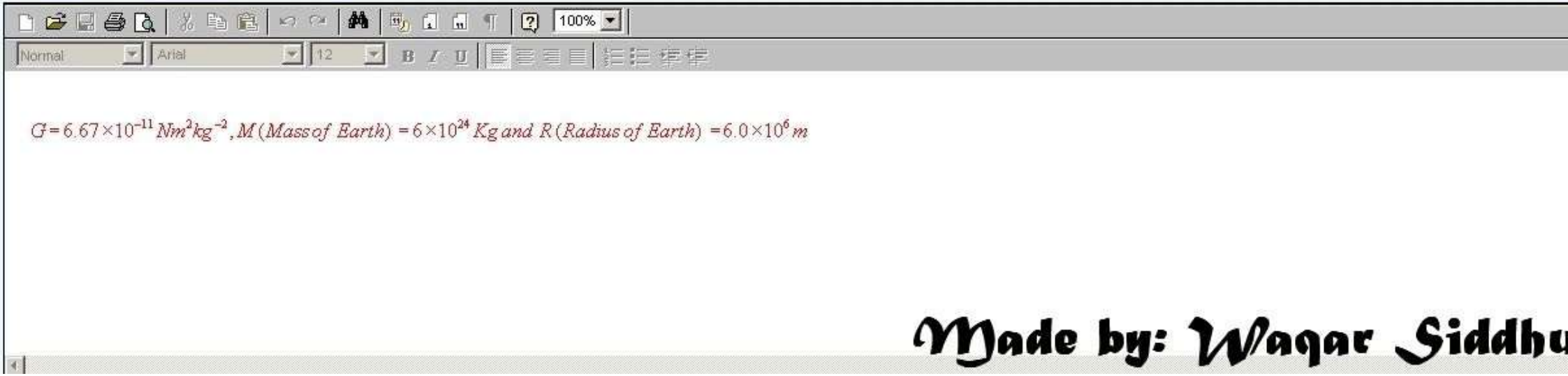
It absorbs all the green. The green contains NO red to be reflected, and the red contains NO range of colours in green to be reflected, so it absorbs them all-black

Made by: Waqar Siddhu

Question No : 33 of 43 **Marks: 2 (Budgeted Time 4 Min)**

What is the minimum speed required to escape from the Earth' gravity?

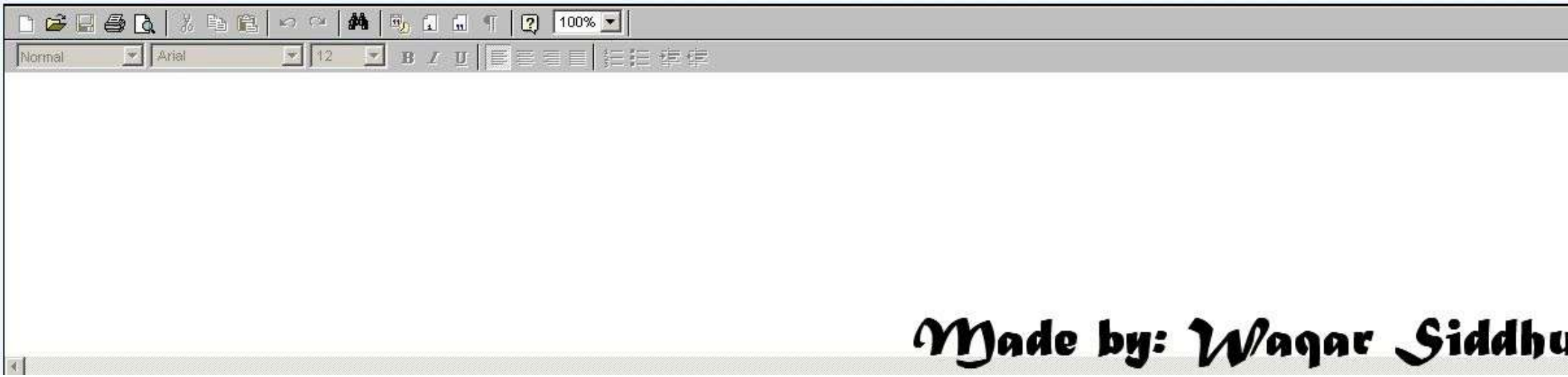
Answer (Please click here to Add Answer)



Question No : 34 of 43 **Marks: 2 (Budgeted Time 4 Min)**

How probability has correlation with quantum mechanics? Define it.

Answer (Please click here to Add Answer)



Question No : 35 of 43 **Marks: 3 (Budgeted Time 6 Min)**

An engineer is designing the runway for an airport. Of the planes which will use the airport, the lowest acceleration rate is likely to be 3 m/s². The takeoff speed for this plane will be 65 m/s. Assuming th minimum acceleration, what is the minimum allowed length for the runway?

Answer (Please click here to Add Answer)

$V = V_0 + a \times t$

since V_0 is $0 m/s^2$

$\frac{V}{A} = T$

Now we know the equation $D = (V + V_0) \times \frac{t}{2}$

so, plug in 0 for V_0 and $\frac{V}{a}$ for t to get,

$D = \frac{(V)(V/a)}{2} = \frac{65^2}{3 \times 2} = 704m$

Made by: Waqar Siddhu

Question No : 36 of 43 **Marks: 3 (Budgeted Time 6 Min)**

When a small magnet is moved toward a solenoid, an emf is induced in the coil. However, if the magnet is moved around inside a toroid, no measurable emf is induced. Explain.

Answer (Please click here to Add Answer)

Solution: Moving a magnet inside the hole of the doughnut-shaped toroid will not change the magnetic flux through any turn of wire in the toroid, and thus not induce any current.

Made by: Waqar Siddhu

Question No : 37 of 43 **Marks: 3 (Budgeted Time 6 Min)**

A piece of copper is dropped into a beaker of water. If the water's temperature rises, what happens to the temperature of the copper? Under what conditions are the water and copper in therm equilibrium?

Answer (Please click here to Add Answer)

Solution:

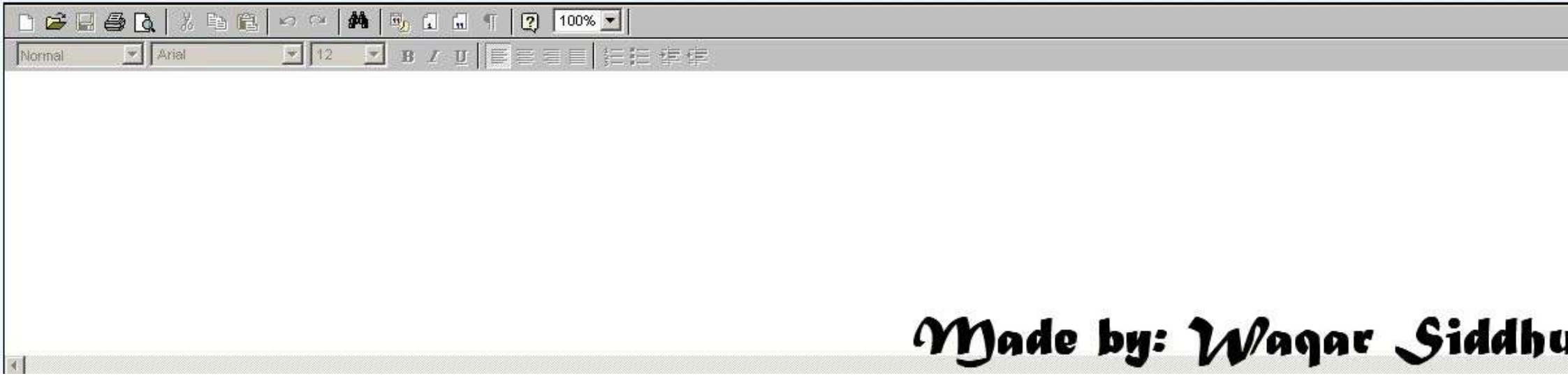
The copper's temperature drops and the water temperature rises until both temperature sare the same. Then the metal and the water are in thermal equilibrium

Made by: Waqar Siddhu

Question No : 38 of 43 **Marks: 3 (Budgeted Time 6 Min)**

Two objects are identical except that one is hotter than the other. Compare how they respond to identical forces.

Answer (Please click here to Add Answer)



Question No : 39 of 43 **Marks: 5 (Budgeted Time 10 Min)**

(a): Why is the material used to make the core of transformers so important?
(b): Why does a capacitor act as a short circuit at high frequencies? Why does it act as an open circuit at low frequencies?

(a) solution: The high permeability, relative to the surrounding air, causes the magnetic field lines to be concentrated in the core material. The magnetic field is often created by a coil of wire around the core that carries a current. The presence of the core can increase the magnetic field of a coil by a factor of several thousand over what it would be without the core.
The use of a magnetic core can enormously concentrate the strength and increase the effect of magnetic fields produced by electric currents and permanent magnets. The properties of a device will depend crucially on the following factors:
the geometry of the magnetic core.
the amount of air gap in the magnetic circuit.
the properties of the core material (especially permeability and hysteresis).

(b) solution: The capacitive reactance is proportional to the inverse of the frequency. At higher and higher frequencies, the capacitive reactance approaches zero, making a capacitor behave like a wire. As the frequency goes to zero, the capacitive reactance approaches infinity—the resistance of an open circuit

Made by: Waqar Siddhu

Question No : 40 of 43 **Marks: 5 (Budgeted Time 10 Min)**

A gas is compressed at a constant pressure of 0.800 atm from 9.00 L to 2.00 L. In the process, 400 J of energy leaves the gas by heat. (a) What is the work done on the gas? (b) What is the change its internal energy?

Answer (Please click here to Add Answer)

(a) Solution : $W = -P(\Delta V) = -(0.800\,atm)(-7.00L)\left(\frac{1.013\times10^5\,Pa}{1atm}\right)\left(\frac{10^{-3}m^3}{1L}\right) = 567J$

$(b)\,Solution: \Delta U = Q + W = -400J + 567J = 167J$

Made by: Waqar Siddhu

Question No : 41 of 43 **Marks: 5 (Budgeted Time 10 Min)**

The standing child is pushing the child seated on the swing. Is the seated child pushing back? If so, is he pushing with the same amount of force or a different amount?



Answer (Please click here to Add Answer)

Normal Arial 12 B I U 100%

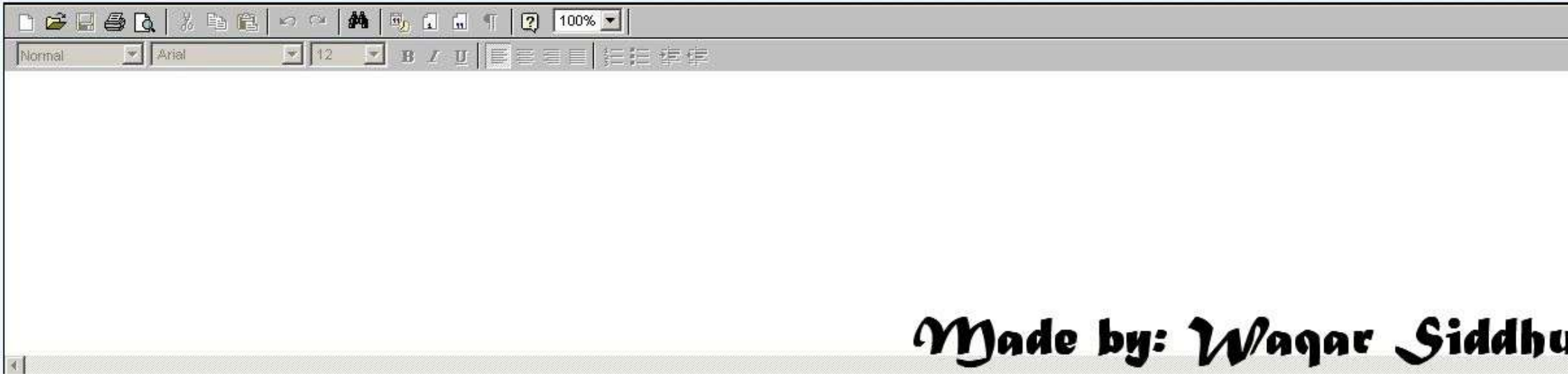
Yes the seated child is pushing back with the same amount of force due to Newton's third law

Made by: Waqar Siddhu

Question No : 42 of 43 **Marks: 5 (Budgeted Time 10 Min)**

Consider Compton scattering with visible light. A photon with wavelength 500 nm scatters backward ($\theta = 180^0$) from a free electron initially at rest. What is the fractional shift in wavelength, $\Delta\lambda / \lambda$ fo
the photon?

Answer (Please click here to Add Answer)



Question No : 43 of 43 **Marks: 5 (Budgeted Time 10 Min)**

Where does an electron go when it is free to move: to a location of higher or lower potential? Give reason in each case.

Answer (Please click here to Add Answer)

Normal Arial 12 100%

It will travel towards a location of higher potential. Electrons tend to move toward positive charges and away from negative charges, which means they move toward regions of higher electric potential, minimizing the electric potential energy. A positive test charge (or proton) would do the opposite, moving toward a region of lower potential, which also minimizes the electric potential energy

Made by: Waqar Siddhu