Assessment

Physics: Lesson 5

Question 1

?Which of the following is **not** a scalar quantity

A. Mass

B. Volume

C. Velocity

D. Time

السؤال خطأ ..

المعروض :

which of the following is a vector quantity ??

Question 2

?Which of the following is **not** a vector quantity

Area .A

Acceleration .B

Force .C

Displacement .D

Question 3

:A vector quantity must have

both units and no direction .A

units or direction or magnitude .B

either direction or magnitude .C

.both magnitude and direction .D

Question 4

?Which statement about forces is true

.Forces only act horizontally or vertically .A

.Forces can be added using vector triangles .B

.Forces on a body always add up to zero .C

If two forces act on the same body along the same line the resultant .D
.cannot be zero

Question 5

الزاوية بينهم 90

Two forces act on a body: a horizontal force of 5 N and a vertical force of 5 N. What is the resultant force?

.A There is a resultant force of 10 N at 45° to the horizontal

.B There is a resultant force of 5 N at 45° to the horizontal

.C There is a resultant force of 7.1 N at 45° to the horizontal

.D There is a resultant force of 7.1 N at 35° to the horizontal

باستخدام نظرية فيثاغورس :

$5^2 + 5^2 = 50$

$\sqrt{50} = 7.1$

* الزاوية 45 لان الزاوية 90 نقسمها على 2

Question 6

Two forces act on a body. A horizontal force of 5 N and a vertical force of ?12 N. What is the magnitude of the resultant force

N 17 .A

N 13 .B

N 12 .C

D. 169 N

Question 7

:When finding the resultant of two forces that act on an object you

can use an accurately drawn vector triangle .A

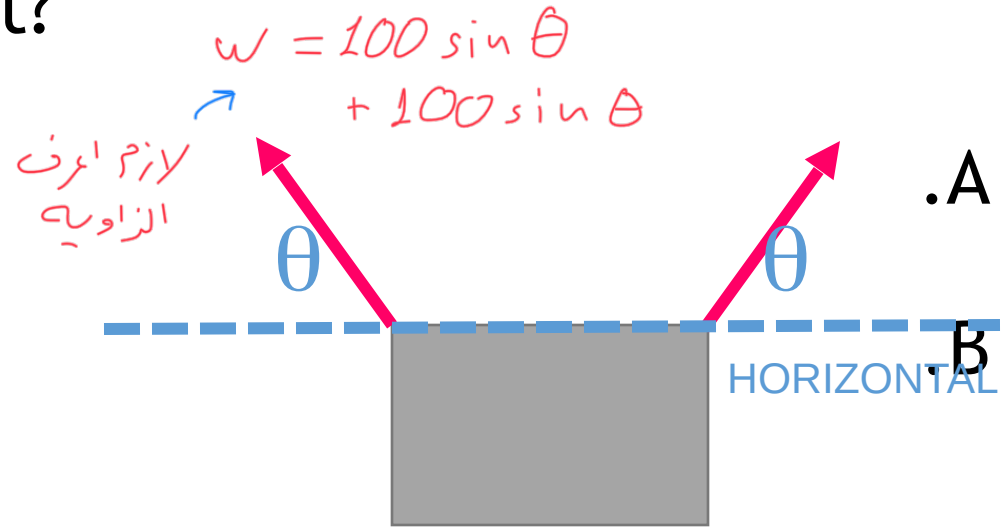
can use trigonometry to find the resultant .B

C. can use either method A or method B

D. must use both methods A and B.

Question 8

Two 100 N forces of the same size, acting at the same angle to the horizontal, are supporting a suspended crate, as shown in the diagram. Which of the following statements is correct?



.A .You can work out the weight of the crate

.B You can work out the weight of the crate if you are given a value for the angle θ.

.C .The crate weighs more than 200 N → الوزن يطلع اقل من 200

.D You cannot work out the direction of the resultant force unless you know the value of angle θ. → انا عارفه الاتجاهات

Question 9

If you use a vector diagram to calculate the resultant of two forces that act on a body at the same time you must:

make the length of each line proportional to the size of each force .A

show the direction of each force by the direction of the line with an arrow .B

include a scale and a reference direction in your diagram .C

do all of the above .D

Question 10

A plane is flying due north at 160 km/h relative to the surrounding air. There is a crosswind blowing due east. If the magnitude of the resultant ?velocity of the plane is 200 km/h, what is the speed of the crosswind

$A^2 + B^2 = R^2$ باستخدام نظرية فيثاغورس

$200^2 - 160^2 = 14400$

$\sqrt{14400} = 120$

km/h 40 .A

km/h 120 .B

km/h 180 .C

km/h 100 .D

Assessment

Physics: Lesson 6

Question 1

:Speed and velocity are

.A different because speed is measured in km/h and velocity is measured in m/s

.B different because speed is a scalar quantity and velocity is a vector quantity

.C different because velocity is a scalar quantity and speed is a vector quantity

.D different terms for the same thing

Question 2

:The correct definition of velocity is

the rate of change of speed with time .A

the rate of change of direction with time .B

the speed of an object .C

the speed of an object and its direction of motion .D

السرعة المتجهة : هي سرعة الجسم واتجاه حركته

Question 3

In a 100 m race, the winner has a time of 10 seconds.
:The winner's top speed is

$$speed = \frac{distance}{time}$$

$$speed = \frac{100}{10} = 10\ m/s$$

m/s 10 .A

more than 10 m/s .B

less than 10 m/s .C

impossible to say .D

Question 4

speed1 time1 speed2 time2

An object travels at 10 m/s for 20 s and then at 16 m/s for a further 20 ?s. What is the average speed of the object

average speed = total distance covered / time interval

m/s 11 .A

* هو معطينا بالسؤال سرعات واحنا محتاجين المسافة

m/s 12 .B

المسافة = السرعة X الزمن

m/s 13 .C

$d_1 = (10 \times 20) = 200\ m$ $d_2 = 16 \times 20 = 320\ m$

m/s 14 .D

الآن نفوض بقانون الـ average speed :

$$\frac{200 + 320}{20 + 20} = 13\ m/s$$

Question 5

.A car accelerates from 20 km/h to 128 km/h in 10 s
.Find its acceleration in m/s^2

m/s^2 3 .A

m/s^2 10.8 .B

m/s^2 38.9 .C

m/s^2 0.3 .D

$$a = \frac{\Delta v}{t} = \frac{v_f - v_i}{t}$$

$$a = \frac{128 - 20}{10} = \frac{108}{10}$$

$$a = 10.8\,km/h^2$$

لتحويل من km/h^2 الى $m/s2$

$$10.8\,km/h^2 \times \frac{1000\,m}{1\,km} \times \frac{3600\,s}{1\,h} = 3\,m/s^2$$

Question 6

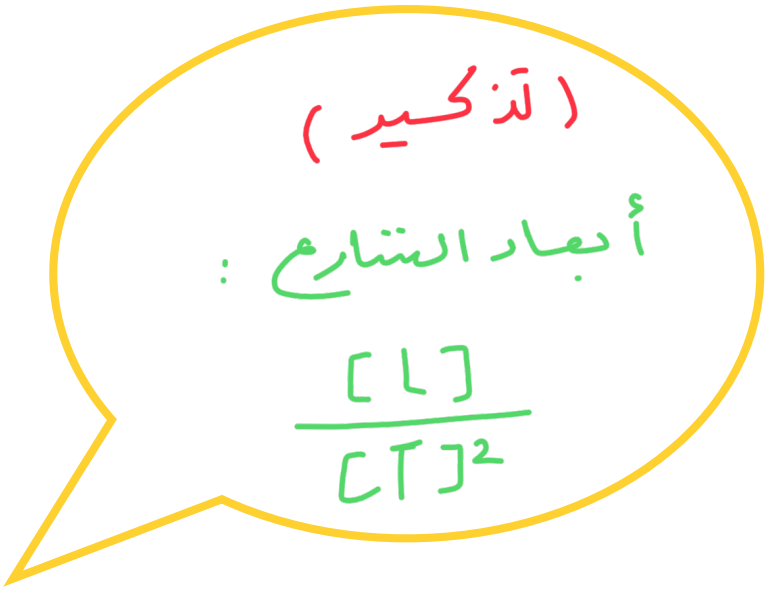
:Acceleration is usually measured in

m/s .A

m/s^3 .B

m/s^2 .C

cm/s .D



Question 7

A ball rolling down a slope accelerates uniformly from rest. Its velocity ?after 5 s is 4 m/s. What is its acceleration

$v_i = 0$

t v_f

m/s² 20 .A

m/s² 1.25 .B

m/s² 4 .C

m/s² 0.8 .D

$$a = \frac{\Delta v}{t}$$

$$= \frac{4 - (0)}{5}$$

$$= 0.8 \text{ m/s}^2$$

Question 8

An object has a uniform acceleration of $-2\ m/s^2$. This means that after 8 :s

سالب يعني تباطؤ

A. its velocity has increased by 16 m/s

B. its velocity has decreased by 16 m/s

C. it has reversed the direction in which it is moving

D. its velocity has not changed

Question 9

A ball is thrown vertically up into the air. Which of the following ?statements is false

.The speed of the ball decreases while it is moving upwards .A

.The speed of the ball will never be zero, as it is always moving .B

The ball's velocity will be positive for some of the time and .C
.negative for some the time

.The ball will eventually fall back to the ground because of gravity .D

Question 10

A car travels 50 km (d) along a straight road in 20 minutes (t). What is its ?average velocity

$$V_{av} = \frac{\text{مجموع المسافات}}{\text{الفترة الزمنية}}$$

$$= \frac{50}{20}$$

$$= 2.5 \text{ Km/min}$$

km/min 2.5 .A

km/h 50 .B

km/min 0.4 .C

km/min 15 .D

Assessment

Physics: Lesson 7

Question 1

A car accelerates from 56 v_i m/s to 96 v_f m/s in 7.3 t s. What ?is its acceleration

$$a = \frac{\Delta V}{t}$$

$$a = \frac{96 - 56}{7.3}$$

$$a = 5.48 \ m/s^2$$

m/s² 5.48 .A

m/s² 20.82 .B

m/s² 13.15 .C

m/s² 7.67 .D

Question 2

A car accelerates from 46 m/s to 96 m/s in 10 s. What is its acceleration?

v_i v_f t

$a = \frac{\Delta v}{t}$

$= \frac{96 - 46}{10}$

$= 5\ m/s^2$

m/s² 50 .A

m/s² 9.6 .B

m/s² 5 .C

m/s² 4.6 .D

Question 3

A car slows down from 26 m/s with an acceleration of -?2 m/s² for 7 s. What is its final velocity

m/s 12 .A

m/s 12- .B

m/s 19 .C

m/s 40 .D

$v_f = v_i + at$

$v_f = (26) + (-2)(7)$

$= 12 \text{ m/s}$

Question 4

An automobile accelerates from **16 km/h** to **96 km/h** ?in **8 s**. What is its acceleration

v_i ↓ 4.4 m/s

v_f ↓ 26.6 m/s

t

$$a = \frac{\Delta v}{t}$$

$$= \frac{26.6 - 4.4}{8}$$

$$= \frac{22.2}{8} = 2.77$$

m/s² 0.8 .A

m/s² 3.3 .B

m/s² 10 .C

m/s² 2.8 .D

Question 5

When the air resistance acting on an object is equal to its weight we say the object has reached its

تعريف السرعه الحديه مو جديد دخماً
في السلاسيات

zero-spеed limit .A

maximum acceleration .B

lowest speed .C

terminal speed .D (circled)

Question 6

As an object falls, the air resistance acts to

A. speed the object up

B. slow the object down

* مقاومة الهواء تعمل على إبطاء الاجسام الساقطة *

C. keep the object at constant speed

D. do nothing

Question 7

The average velocity of a rolling ball is 3.00 m/s. How ?long does it take for the ball to roll 20 m

How long = يعني المطلوب : زمن

$s = V_{av}\, t$

$t = \frac{s}{V_{av}} = \frac{20}{3.00} = 6.67$

s 60 .A

s 0.25 .B

s 6.67 .C

s 1 .D

Question 8

A train speeding up has an average acceleration of 3.50 m/s^2. If ?its initial velocity is 10.0 m/s, how far does it travel in 2.0 s

How far = s المطلوب

$s = v_i t + \frac{1}{2} a t^2$

$s = (10)(2) + \frac{1}{2}(3.50)(2)^2$

$= 27\ m$

m 7 .A

m 27 .B

m 17 .C

m 34 .D

Question 9

A rock is dropped from a bridge. It has a velocity of 23 m/s when it hits the ground? How long is the rock in the air? (Ignore air resistance; acceleration due to gravity is 9.80 m/ .(s^2

How long = time الزمن

s 4.6 .A

$v_f = v_i + at$

s 0.2 .B

$t = \frac{v_f - v_i}{a}$

s 2.3 .C

$t = \frac{23 - 0}{9.80} = 2.3$

s 9.8 .D

Question 10

A ball is dropped from the top of a building. It has a velocity of 31 v_f m/s when it hits the ground? How tall is the building? (Ignore air resistance; acceleration due to gravity is 9.80 m/ a .(s^2

How tall = s ?

$s = v_i t + \frac{1}{2} a t^2$

$t = \frac{\Delta v}{a} = 3.16\,s$

$s = (0)(3.13) + \frac{1}{2}(9.80)(3.16)^2$

$= 48.9\ m$

≈ 49

m 98 .A

m 3 .B

m 31 .C

m 49 .D

Assessment

Physics: Lesson 8

Question 1

?Which of the following statements about a force is false

A force can make an object accelerate ✓ .A

A force can change the shape of an object ✓ .B

A force can change the direction of a moving object ✓ .C

D. A force can only act on a moving objects

Question 2

Inertia is the property of a body that

التعريف هو جمود بالشيء في السلايدات

A. keeps it moving

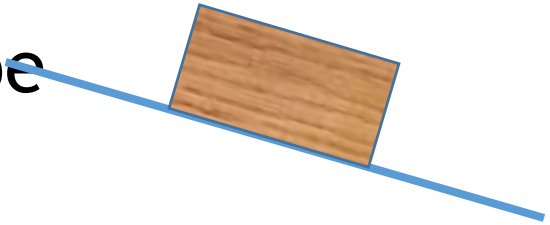
B. makes it want to stop moving

C. makes it difficult to change the way it is moving

D. makes it accelerate

Question 3

.This diagram shows a block of wood at rest on a slope
?What correctly describes this situation



.A. As the block is at rest there are no forces acting on it

.B. This is impossible as the force of gravity must make it move

.C. The block must have too much mass to move

.D. The block does not move because there is no net force acting on it

Question 4

?What is the unit of force in terms of SI base units

A. $kg\ m/s^2$

B. $kg\ m/s$

C. m/s

D. m/s^2

Question 5

What net force is necessary to produce an acceleration of 10.00 m/s2 ?on a mass of 2.00 kg

$F = ma$

$F = 2 \times 10 = 20\,N$

N 20 .A

N 12 .B

N 8 .C

N 5 .D

Question 6

What force is necessary to produce an acceleration of 2.5 m/s2 on a mass ?of 7.5 kg

A. 15 N

B. 0.33 N

C. 3 N

D. 18.75 N

$F = ma$

$F = 7.5 \times 2.5$

$= 18.75\ N$

Question 7

What force is necessary to produce an acceleration of 30.00 m/s2 on a ?mass of 5.00 kg

N 6 .A

N 150 .B

$F = m a$

$F = 5.00 \times 30.00$

$= 150$

N 15 .C

N 60 .D

Question 8

?The SI unit for normal force is

N	.A
$kg.s/m^2$	.B
Nm/s^2	.C
kg.m/s	.A

Question 9

A man weighing 600 N stands at rest on two bathroom scales so that his weight is distributed evenly between them. The reading on each scale :is

N 800 .A

B. 200 N

$600 \div 2 = 300\ N$

C. 1600 N

D. 300 N

Question 10

An object is accelerated at 5.0 m/s^2 by a force of 2.5×10^7 N. What is its ?mass

A. 1.25×10^8 kg

B. 5×10^7 kg

C. 1.25×10^6 kg

D. 5×10^6 kg

$F = ma$

$m = \frac{F}{a}$

$= \frac{2.5 \times 10^7}{5.0}$

$= 5 \times 10^6$ kg

Assessment

Physics: Lesson 9

Question 1

The frictional force is caused by interactions between the object and .the surface it is resting on

True .A

False .B

Question 2

?The frictional force that governs an object in motion is called

Static friction .A

Friction .B

Kinetic friction .C

Net force .D

Question 3

The direction of the frictional force is always _____ the motion of the object.

A. perpendicular to

B. in the same direction as

C. opposite to

D. not equal to

Question 4

:The frictional force that governs an object at rest is called

Static friction .A

Total force .B

Kinetic friction .C

Net force .D

Question 5

What is the net force acting on an object if there is a force of 15 N acting to the right and a frictional force of 3 N acting to the left? .Assume forces acting to the right are positive

N 15 .A

$15 - 3 = 12\ N$

N 12 .B

N 12- .C

N 18 .D

Question 6

What is the static-friction force acting on an object if there is a force of 1.5 N acting to the right and the object is not moving? Assume forces .acting to the right are positive

N 1.5 .A

N 1.5- .B

N 0 .C

D. Not enough information provided

Question 7

A force is needed to keep a 400 N wooden box sliding on a wooden floor with a coefficient of kinetic friction equal to 0.10. What is the force ?acting on the box

$F_f = \mu F_N$

$F_f = 0.10 \times 400$

$= 40$

N 4000 .A

N 400 .B

N 40 .C

D. 4 N

Question 8

._____ Kinetic friction is also known as

Sliding friction .A

موجود في السلايدات ضمناً

Static friction .B

Total force .C

Net force .D

Question 9

The net force is the arithmetic sum of both vertical and horizontal .forces

True .A

False .B

Question 10

To decrease the frictional force, you need to decrease the surface area .of the object in contact with the ground

True .A

False .B

Assessment

Physics: Lesson 10

Question 1

How many forces are involved in an interaction ?between two objects

4 .A

0 .B

3 .C

2 .D

Question 2

What is the direction of the force the ground applies to a ?stationary car

Upward .A

Downward .B

Parallel to the road surface .C

There is no force .D

Question 3

Every action has an opposite and equal reaction is a :statement of

Newton’s first law .A

Newton’s second law .B

Newton’s third law .C

Newton’s fourth law .D

Question 4

Identify the force pair in this system: a car stationary on the .road

Weight and the normal force .A

Mass and the normal force .B

Mass and friction .C

Weight and friction .D

Question 5

What is the force the ground applies to a person with a mass ?of 70 kg

$70\,kg \times 9.80\,m/s^2 = 686\,kg\,m/s^2$

$= 686\,N$

N 686 .A

N 70 .B

N 0 .C

N 9.8 .D

Question 6

A truck crashes all the way through a wall. Since the wall collapses, the wall sustains a greater force than the truck does.

?According to Newton's laws of motion, is this true or false

True .A

False .B

Question 7

Suppose that the mass of the spacecraft is 5,000 kg and that the mass of the astronaut is 105 kg. The astronaut pushes with a force of 420 N on the spacecraft. Find the .acceleration of the astronaut

$F = ma$

$a = \frac{F}{m}$

$= \frac{420}{105}$

$= 4\ m/s^2$

m/s^2 4 .A

m/s^2 0.084 .B

m/s^2 0 .C

m/s^2 44.100 .D

Question 8

When a man pushes on a wall with force F, the wall pushes :back on him with force of magnitude

A. Zero

B. F/2

C. F

D. 2 F

Question 9

When a man stretches a spring with a 400-N force (within its :elasticity range), the spring pulls him back with

A. 0 N

B. 50 N

C. 400 N

D. 200 N

Question 10

When a cannon shoots a cannonball with force F_b, the cannon :recoils with force F_c such that

A. $F_c = F_b$

B. F_c is much larger than F_b

C. F_c is much smaller than F_b

D. $F_c = 0$

Assessment

Physics: Lesson 11

Question 1

.Work is _____ multiplied by the distance the object travels

Mass .A

Velocity .B

Acceleration .C

Force .D

Question 2

The SI unit for work is

Joule .A

N .B

G .C

m/s .D

Question 3

?Which of these can be used as a unit for work

N .A

N/m .B

N.m .C

m/s .D

Question 4

A force acts on a block with a magnitude of 20 N. The block travels 20 ?m in the direction of the force. How much work is done on the block

$W = fs$

$W = (20)(20) = 400\ J$

A. 20 J

B. 400 J

C. 0 J

D. 40 J

Question 6

A force acts on a block with a magnitude of 20 N perpendicular to the direction the block travels, which is 20 m. How much work is done on the ?block by the force

perpendicular يعني عمودي .. الزاوية = 90

جتا = cos(90)

$W = F s \cos\theta$

$W =$ جتا

A. 20 J

B. 400 J

C. 0 J

D. 40 J

Question 8

What is the force acting on a block that has 150 J of work done on it ?and travels 5 m

A. 155 N

B. 30 N

C. 0 N

D. 145 N

$W = fs$

$f = \frac{W}{s}$

$= \frac{150}{5}$

$= 30\,N$

Question 5

A force acts on a block with a magnitude of 10 N (f). The block travels 20 ?m (s) in the direction of the force. How much work is done on the block

$W = fs$

$W = 10 \times 20$

$= 200\,J$

A. 20 J

B. 200 J

C. 0 J

D. 30 J

Question 7

A force acts on a block with a magnitude of 10 N perpendicular to the direction the block travels, which is 20 m. How much work is done on ?the block force

عامودي => صفر

A. 0 J

B. 200 J

C. 20 J

D. 30 J

Question 9

What is the force acting on a block that has 15 J of work done on it ?and travels 30 m

$W = fs$

$f = \frac{W}{s}$

$f = \frac{15}{30} = 0.5\,N$

N 45 .A

N 2 .B

N 0.5 .C

N 15 .D

Question 10

What is the force acting on a block that has 60 J of work done on it and ?travels 3 m

$W = fs$

$f = \frac{W}{s}$

$= \frac{60}{3}$

$= 20N$

N 20 .A

N 63 .B

N 0.05 .C

N 57 .D

Assessment

Physics: Lesson 12

Question 1

?What is the definition of power

A. Time over work $P = \frac{w}{t}$

B. Work multiplied time

C. They are not related

D. Work over time

Question 2

?What is the SI unit of power

watts .A

joules .B

horsepower .C

seconds .D

Question 3

?What is the definition of work in terms of power

Power divided by time .A

$P = \frac{w}{t}$ $w = P \times t$ ← نربّة القانون

Power multiplied by displacement .B

Power multiplied by time .C

D. Power and work are not related

Question 4

?Which of these is a unit of power

joules .A

newton meter .B

joules per second .C

زمن ← على ← شغل

seconds .D

Question 5

What is the average power if 2500 J (W) of work is done by a machine in ?15.4 s (t)

$P = \frac{W}{t}$

$= \frac{2500}{15.4\,s}$

$= 162.3$

watts 38,500 .A

watts 162.3 .B

watts 0.00616 .C

watts 0 .D

Question 6

What is the average power if 500 J of work is done by a machine in 1 ?hour → تحول الى s

watts 0.139 .A

$P = \frac{W}{t}$

$= 500 \div 60 \div 60 = 0.139$

watts 500 .B

watts 0.002 .C

watts 7.2 .D

Question 7

?How many horsepower are there in 1000 watts ⟶ 1KW

hp 746,000 .A

hp 746 .B

hp 1 .C

hp 1.34 .D

بـ الالة الحاسبة : shift → 5 → 3 0

1.34 =

أو بالحل التقليدي :

$1000\,w \times \frac{1\,hp}{750\,w}$

$= 1.34$

Question 8

?How many watts are there is 500 horsepower

watts 0.67 .A

$500\,hp \times \frac{750\,w}{1\,hp} = 373000$

watts 373,000 .B

watts 746 .C

watts 373 .D

Question 9

What is the average power if 3570 J (W) of work is done by a machine in ?5.4 s (t)

$P = \frac{W}{t}$

$= \frac{3570}{5.4} = 661.1$

watts 19,278 .A

watts 0.00151 .B

watts 66 .C

watts 661 .D

Question 10

?How many watts are there in 5 horsepower

watts 0.014 .A

$5hp \times \frac{750w}{1hp} = 3750w$

watts 746 .B

watt 1 .C

watts 3730 .D

Assessment

Physics: Lesson 13

Question 1

?Which of the following is the SI unit for energy

Newton .A

Watt .B

Joule .C

m/s .D

Question 2

?Which of the following is the SI unit for kinetic energy

Newton .A

Watt .B

m/s .C

joule .D

Question 3

? What is the kinetic energy of a 300 kg car moving at 20 m/s

A. 6000 J

B. 60,000 J

C. 320 J

D. 3000 J

$KE = \frac{1}{2}mv^2$

$= \frac{1}{2}(300)(20)^2$

$= 60000\ J$

Question 4

What is the potential energy of a 2500 kg plane 25 meters above the ?ground

A. 62,500 J

B. 100 J

C. 2525 J

D. 612,500 J

$PE = mgh$

$= (2500 \times 9.8 \times 25)$

$PE = 612500\ J$

Question 5

?energy is the energy due to position _____

Kinetic .A

Gravitational potential .B

Nuclear .C

Electrical .D

Question 6

Energy is a measure of the work that can be done on/by an object

True .A

False .B

Question 7

A car starts from rest and uses 10,000 J of work to accelerate. What is ?it final speed if it has a mass of 500 kg

A. 20.4 m/s

B. 6.3 m/s

C. 10.5 m/s

D. 0 m/s

W

m

$KE = W$

$KE = \frac{1}{2} m v^2$

$W = \frac{1}{2} m v^2$

$v = \sqrt{\frac{2W}{m}}$

$v = \sqrt{\frac{2(10000)}{500}}$

$v = 6.3 \text{ m/s}$

Question 8

You drop a ball from a height of 20 m. What is its speed when it hits ?the ground

$KE = PE \longrightarrow mgh = \frac{1}{2}mv^2 \longrightarrow v = \sqrt{2gh}$

$v = \sqrt{2(9.8)(20)}$

$= 19.79$

A. 10.2 m/s

B. 0 m/s

C. 19.8 m/s

D. 32.1 m/s

Question 9

The total energy of an object of mass (m), falling at height (h) with :speed (v) can be written as

E = ½ mv2 + 2 mgh .A

E = ½ mv2 + mgh .B

$E = KE + PE$

E = mv2 + ½ mgh .C

E = ½ mv2 + ½ mgh .D

Question 10

You drop a 1 kg ball from a height of 50 m. What is the ball's kinetic ?energy when it reaches the ground

A. 0 J

B. 490 J

C. 50 J

D. 254 J

أولاً.. نجيب السرعة :

$V = \sqrt{2gh} = 31.3 \text{ m/s}$

$KE = \frac{1}{2} m v^2$

$KE = \frac{1}{2}(1)(31.3)^2$

$= 489.8 \text{ J}$

Assessment

Physics: Lesson 14

Question 1

?Which of the following is the SI unit for heat

J .A

N .B

Watt .C

m/s .D

Question 2

?Which of the following is the SI unit for absolute temperature

F° .A

C° .B

K .C

J .D

Question 3

.Convert 60°F to Celsius

A. 15.5°C

B. 140°C

C. 333°C

D. 0°C

1: من الآلة الحاسبة: shift → 8 → 3 7

= 15.5°C

2: $T_C = \frac{5}{9}(T_F - 32)$

= 15.5°C

Question 4

.Convert 20°F to Celsius

A. 68°C

B. 293°C

C. -6.67°C

D. 0°C

نفس طريقة السؤال السابق :

= -6.67°C

Question 5

.Convert 40°F to Celsius

A. 104°C

B. 4.44°C

نفس طريقة السؤال السابق

C. 313.°C

D. 0°C

Question 6

.Convert 90°C to Fahrenheit

A. 194°F

B. 32°F

C. 363°F

D. 0°F

1: إلى الآلة الحاسبة :

shift → 8 → 3 8

= 194f

2 :

$T_f = \frac{9}{5}(T_c + 32)$

Question 7

.Convert 100°C to Fahrenheit

A. 37.8°F

B. 373°F

C. 212°F

D. 0°F

نفس طريقة السؤال السابق

Question 8

.Convert 130°C to Fahrenheit

A. 54.4°F

B. 403°F

C. 266°F

D. 0°F

لنفس طريقة السؤال السابق :

Question 9

.Convert 140°C to kelvin

A. 413 K

140 + 273 = 413

B. 60 K

C. 284 K

D. 0 K

Question 10

Find the amount of heat in kcal generated by 7510 J .of work

A. 1.43 kcal

B. 1.79 kcal

C. 8.11 kcal

D. 31.7 kcal

بالآلة الحاسبة:

shift → 8 → 3 9

= 1794 c

تحول الى كيلو كالوري = 1.794

بالطريقة الطويلة:

$$7510\,J \times \frac{1\ Kcal}{4190\,J}$$

$$= 1.79\ Kcal$$

Assessment

Physics: Lesson 15

Question 1

When a solid undergoes a change of phase into a liquid this is called

Melting .A

Freezing .B

Vaporizing .C

Boiling .D

Question 2

When a liquid undergoes a change of phase into a solid this is called

Melting .A

Freezing .B

Vaporizing .C

Boiling .D

Question 3

When a liquid undergoes a change of phase into a gas this is called

Melting .A

Freezing .B

Vaporizing .C

Boiling .D

Question 4

What heat is needed to change the temperature of 10 kg of water (c = ?1.00 kcal/kg degree-C) from 10 to 20 degrees-C

A. 10 kcal

B. 200 kcal

C. 100 kcal

D. 419 kcal

$Q = cm\Delta T$

$= 1 \times 10 \times 10$

$= 100$ kcal

Question 5

How many calories of heat are given off by 10 g of steam at 100 degrees C to condense to water at 100 degrees C? (L-vaporization = 540 cal/g)

$L_v = \frac{Q}{m}$

$Q = L_v \times m$

$= 540 \times 10$

A. 540 cal

B. 540000 cal

C. 54000 cal

D. 5400 cal

Question 6

It takes 100,000 J of heat to raise the temperature of water from 10°C to 11°C. What is the mass of the water? The specific heat of water is 4186 .J/(kg°C)

A. 23.9 kg

B. 4186 kg

C. 1.2 kg

D. 4.186 kg

$Q = cm\Delta T$

$m = \frac{Q}{c\Delta T}$

$m = \frac{100000}{4186 \times 1}$

$= 23.9\ kg$

Question 7

How much heat is needed to raise the temperature of 4 kg of water .from 20°C to 30°C? The specific heat of water is 4186 J/(kg°C)

m

ΔT

C

$Q = cm\Delta T$

$Q = 4186 \times 4 \times 10$

$= 167440\ J$

A. 16,744 J

B. 4186 J

C. 502,320 J

D. 167,440 J

Question 8

How much heat is needed to raise the temperature of 6 kg of marble .from 10°C to 30°C? The specific heat of marble is 880 J/(kg°C)

نفس طريقة السؤال السابق :

A. 5280 J

B. 105,600 J

C. 10,560 J

D. 52,800 J

Question 9

What is the change in temperature (ΔT) of 4 kg (m) of water if it takes 1,000,000 J (Q) of heat? The specific heat of water is 4186 J/(kg°C) (c)

A. 238.9°C

B. 59.7°C

C. 10.5°C

D. 0°C

$$Q = cm\Delta T$$

$$\Delta T = \frac{Q}{cm}$$

$$= \frac{1000000}{4 \times 4186}$$

$$= 59.7\,C$$

Question 10

What is the change in temperature of 14 kg of water if it takes 100,000 J .of heat? The specific heat of water is 4186 J/(kg°C)

A. 23.9°C

→ نفس طريقة السؤال السابق

B. 17.1°C

C. 0°C

D. 1.7°C

Assessment

Physics: Lesson 16

Question 3

An example of an elastic material is

Cement .A

Clay .B

Dough .C

Rubber ball .D

Question 4

How much force is needed to pull a spring 0.25 m if the spring constant ?is equal to 10 N/m

A. 40 N

B. 10 N

C. 0.25 N

D. 2.5 N

Question 5

How much force is needed to pull a spring 0.25 m if the spring constant ?is equal to 20 N/m

A. 80 N

B. 5 N

C. 20 N

D. 0.25 N

Question 6

How much force is needed to pull a spring 0.5 m if the spring constant is ?equal to 1 N/m

A. 0.5 N

B. 1 N

C. 2 N

D. 1.5 N

Question 7

How far does a spring with a spring constant of 100 N/m compress if 2 N ?of force is used to compress it

A. 0.2 m

B. 0.02 m

$\frac{2}{100} = 0.02$

C. 1 m

D. 2 m

Question 8

How far does a spring with a spring constant of 100 N/m compress if ?20 N of force is used to compress it

m 0.2 .A

B. 2 m

$\frac{20}{100} = 0.2$

C. 20 m

D. 1 m

Question 9

What is the spring constant of a spring that is compressed 0.4 m if 20 N ?of force is used to compress it

A. 1 N/m

B. 5 N/m

C. 0.5 N/m

D. 50 N/m

$\frac{20}{0.4} = 50$

Question 10

A cube of iron of 10-cm sides weighs 60 N. The stress it exerts on a flat :surface is

$A = 10 \times 10 = 100 cm^2$

$= 0.01 m^2$

حولنا الى متر عشان الخيارات بالكتاب

F

$S = \frac{F}{A}$

$= \frac{60}{0.01}$

$= 6000 PA$

A. 60 Pa

B. 600 Pa

C. 6000 Pa

D. 60,000 Pa

Assessment

Physics: Lesson 17

Question 2

.is defined as a mass per unit volume _____

Mass density .A

Weight density .B

Weight .C

Answer not present .D

Question 3

.is defined as a weight per unit volume _____

Mass density .A

Weight density .B

Mass .C

Answer not present .D

Question 4

Find the weight density of a block of wood 3.00 in. × 2.00 in. × 5.00 in. .with a weight of 0.300 lb

A. 17.28 lb/ft^3

B. 0.01 lb/ft^3

C. 100.0 lb/ft^3

D. 1.00 lb/ft^3

$$D_w = \frac{W}{V}$$

$$= \frac{0.300}{3 \times 2 \times 5}$$

$$= 0.01 \text{ lb/in}^3 \times (12)^3$$

$$= 17.28 \text{ lb/ft}^3$$

Question 5

Find the weight density of a block of wood 0.20 m × 0.20 m × 0.40 m .with a weight of 67.2 N

A. 1.07 N/m³

B. 1680 N/m³

C. 4200 N/m³

D. 2.69 N/m³

$$D_w = \frac{w}{V}$$

$$= \frac{67.2}{0.20 \times 0.20 \times 0.40} = 4200 N/m^3$$

Question 6

0.02 m

Find the mass density of a sphere of wood with a 2.00 cm. radius and a .mass of 0.500 Kg

$V = \frac{4}{3}\pi (r)^3$

A. 14921 Kg/m³

$D_m = \frac{0.500}{\frac{4}{3}\pi (0.02)^3}$

B. 5.97 Kg/m³

C. 0.0597 Kg/m³

D. 1 Kg/m³

Question 7

Find the mass density of a sphere of wood with a 0.03 m radius and a .mass of 0.100 Kg

A. 1 Kg/m^3

B. 0.796 Kg/m^3

C. 0.00796 Kg/m^3

D. 884 kg/m^3

$$D_m = \frac{0.100}{\frac{4}{3}\pi (0.03)^3}$$

Question 8

Find the weight density of a can of oil (2 quart) weighing 1.50 lb. (1 .quart = 0.03342 ft^3)

$$D_w = \frac{w}{V}$$

$$= \frac{1.50}{2 \times 0.03342}$$

$$= 22.4 \, lb/ft^3$$

A. 1296 lb/ft^3

B. 22.4 lb/ft^3

lb/ft^3 44.8 .C

lb/ft^3 77.1 .D

Question 9

Copper has a mass density of 8890 kg/m^3. Find its mass density in g/.cm^3

$8890\,kg/m^3 \times 1000 = 8890000\,g/m^3$

$8890000\,g/m^3 \div 10^6 = 8.89\,g/cm^3$

A. 0.889 g/cm^3

B. 889 g/cm^3

C. 88.9 g/cm^3

D. 8.89 g/cm^3

Question 10

A quantity of gasoline weighs 33.3 N with weight density 6660 N/m³. Find .its volume

A. 2.50×10^{-3} m³

B. 5.00×10^{-3} m³

C. 2.00×10^{2} m³

D. 1.00×10^{-3} m³

$$D_w = \frac{w}{V}$$

$$V = \frac{w}{D_w}$$

$$= \frac{33.3}{6660}$$

$$= 5 \times 10^{-3} \text{ m}^3$$

Assessment

Physics: Lesson 18

Question 1

?Which electric charge has lines of force drawn away from the charge

Positive .A

Negative .B

Neutral .C

None of the charges .D

Question 2

Which of the following is the correct statement about the fundamental ?characteristic of electric charges

A. Like charges repel and attract each other.

B. Unlike charges repel and like charges attract each other.

C. Like and unlike charges neither attract nor repel.

D. Like charges repel and unlike charges attract each other.

Question 3

?is the SI unit for charge _____

J .A

N .B

W .C

C .D

Question 4

:A positively charged object is an object with

A. extra electrons

B. lack of electrons

C. extra neutrons

D. lack of protons

Question 5

6.5×10^{-6} C

Two charges, each with magnitude + 6.50 μC, are separated by a .distance of 0.400 cm. Find the force of repulsion between them

4×10^{-3} m

A. 3.65×10^{-9} N

B. 9.50×10^{-17} N

C. 2.38×10^{4} N

D. 1.46×10^{-11} N

$$F = k \frac{q_1 q_2}{r^2}$$

$$= 9 \times 10^{9} \frac{6.5 \times 10^{-6} \times 6.5 \times 10^{-6}}{(4 \times 10^{-3})^2}$$

$$= 2.38 \times 10^{4}$$

Question 6

What is the electrostatic force between two charges of +6 nC and +1 nC ?if they are separated by a distance of 2 mm

6×10^{-9} 1×10^{-9} 2×10^{-3}

A. 6.91×10^{-10} N

B. 1.03×10^{-2} N

→ نفس طريقة السؤال السابق

C. 1.06×10^{-4} N

D. 1.35×10^{-2} N

Question 7

4×10^{-9} C 3×10^{-9} C

Calculate the distance between two charges of +4 nC and −3 nC if .the electrostatic force between them is 0.005 N

A. 6.50×10^{-6} m

B. $8.67 \times 10^{+7}$ m

C. 46.0×10^{-3} m

D. 4.6×10^{-3} m

$$F = k \frac{q_1 q_2}{r^2}$$

$$r = \sqrt{\frac{k q_1 q_2}{F}}$$

$$= 4.64 \times 10^{-3} \text{ m}$$

Question 8

Find the magnitude of the electric field in which a negative charge of $10^{-8} \times 3$ C experiences a force of 0.06 N

A. $2 \times 10^{+6}$ N/C

B. 5×10^{-9} N/C

C. 6×10^{-3} N/C

D. 3×10^{-3} N/C

$$E = \frac{F}{q}$$

$$= \frac{0.06}{3 \times 10^{-8}}$$

$$= 2 \times 10^{6} \text{ N/C}$$

Question 9

What force is exerted on a test charge of 4×10^{-5} C if it is placed in an electric ?field of magnitude 2×10^{4} N/C

A. 22 N

B. 8 N

C. 0.8 N

D. 80 N

$$E = \frac{F}{q}$$

$$F = Eq$$

$$= 2 \times 10^{4} \times 4 \times 10^{-5}$$

$$= 0.8\ N$$

Question 10

An electric field of magnitude 0.4 N/C exerts a force of 8×10^{-4} N on a test ?charge placed in the field. What is the magnitude of the test charge

$$E = \frac{F}{q}$$

$$q = \frac{F}{E}$$

$$q = \frac{8 \times 10^{-4}}{0.4}$$

$$= 2 \times 10^{-3} C$$

C 1 .A

mC 2 .B

nC 3 .C

nC 2 .D

Assessment

Physics: Lesson 19

Question 1

.is the SI unit for current _____

Ω .A

V .B

J .C

A .D

Question 2

.is the SI unit for voltage _____

J .A

V .B

A .C

Ω .D

Question 3

.is the SI unit for resistance _____

V .A

A .B

J .C

Ω .D

Question 4

:Electric energy can be stored in a

A. switch

B. light bulb

C. capacitor

D. resistance

Question 5

When a capacitor is connected to a battery, the plate connected to the _____ _____ terminal becomes

A. positive, negative

B. negative, positive

C. positive, positive

D. positive, neutral

Question 6

:Ohm’s law states that

voltage = current − resistance .A

voltage = current + resistance .B

voltage = current ÷ resistance .C

voltage = current × resistance .D

Question 7

A torch lamp takes a current of 0.3 (I) amperes from a 3 (V) volt battery. What ?is its resistance

$V = IR$

$R = \frac{V}{I}$

$= \frac{3}{0.3} = 10\ \Omega$

A. 3 Ω

B. 10 Ω

Ω 20 .C

Ω 35 .D

Question 8

A heating element on an electric stove operating on 110 V has a ?resistance of 20.0 Ω. What current does it draw

$V = I R$

$I = \frac{V}{R}$

$= \frac{110}{20} = 5.5\ A$

A. 0.18 A

B. 2200 A

C. 5.5 A

D. 90 A

Question 9

A heating element on an electric stove operating on 130 V has a ?resistance of 20.0 Ω. What current does it draw

V

R

$V = IR$

$I = \frac{V}{R}$

$= \frac{130}{20} = 6.5A$

A. 110 A

B. 2600 A

C. 0.15 A

D. 6.5 A

Question 10

A 10.0 m copper wire (resistivity $1.72 \times 10^{-6}\ \Omega$ cm) has a cross-sectional area 9.5×10^{-3} cm^2. Its resistance is:

$R = \frac{\rho L}{A}$

$= \frac{1.72 \times 10^{-6} \times 1000}{9.5 \times 10^{-3}}$

$= 0.181\ \Omega$

$\Omega\ 10^{-1} \times 1.81$ .A

$\Omega\ 10^{-9} \times 1.63$ .B

$\Omega\ 10^{-7} \times 1.63$ .C

$\Omega\ 10^{+4} \times 5.52$ .D

Assessment

Physics: Lesson 20

Question 4

A soldering iron draws 20.50 A in a 120-V circuit. What is its ?wattage rating

I V

A. 5.85 W

B. 99.5 W

C. 0.171 W

D. 2460 W

$P = IV$

$= 20.50 \times 120$

$= 2460\ W$

Question 7

?What is the power of a 12-V heater with a resistance of 10Ω

A. 120 W

B. 2 W

C. 14.4 W

D. 12 W

$P = VI = V\left(\frac{V}{R}\right)$

$P = \frac{V^2}{R}$

$= \frac{12^2}{10}$

$= 14.4\,W$

Question 9

0.550 kW

An electric fire is rated at 550 W. How much would it cost to ?operate it for 5 h at $0.08/kWh

power

hour

cents

cost = power x hours x cents

= 0.550 x 5 x 0.08

= 0.22 $

A. $0.02

B. $2.2

C. $22

D. $0.22

Question 1

:In electricity, the kilowatt-hour is a unit of

A. electric current

B. electric energy

C. electric potential

D. electric power

Question 2

If a light bulb in a 440-V electric circuit draws 0.5 amperes, :its power rating is

V

I

$P = VI$

$= 440 \times 0.5$

$= 220W$

A. 220 W

B. 840 W

C. 40 W

D. 75 W

Question 3

:The rate of consuming energy is called

voltage .A

current .B

power .C

resistance .D

Question 5

A soldering iron draws 25.50 A in a 120-V circuit. What is its ?wattage rating

I V

$P = IV$

$= 25.50 \times 120$

$= 3060\,W$

A. 3060 W

B. 4.71 W

C. 0.213 W

D. 94.5 W

Question 6

A MP3 system draws 30.50 A in a 120-V circuit. What is its ?wattage rating

A. 3.93 W → نفس طريقة السؤال السابق

B. 3660 W

C. 0.254 W

D. 89.5 W

Question 8

An electric heater connected to the 230-V mains supply draws ?a current of 4A. What is the power of the electric heater

A. 920 W

نفس طريقة الاسئلة السابقة

B. 57.5 W

C. 230 W

D. 950 W

Question 10

0.250kW 0.5h

A TV needs 250 W. It is switched on for 30 minutes. If each kWh costs 8 ?cents, how much does it cost to run the TV

A. $2

B. 1 cent

C. 4 cents

D. 2 cents

cost = power x hour x cents

= 0.250 x 0.5 x 8

= 1 cents

Assessment

Physics: Lesson 21

Question 1

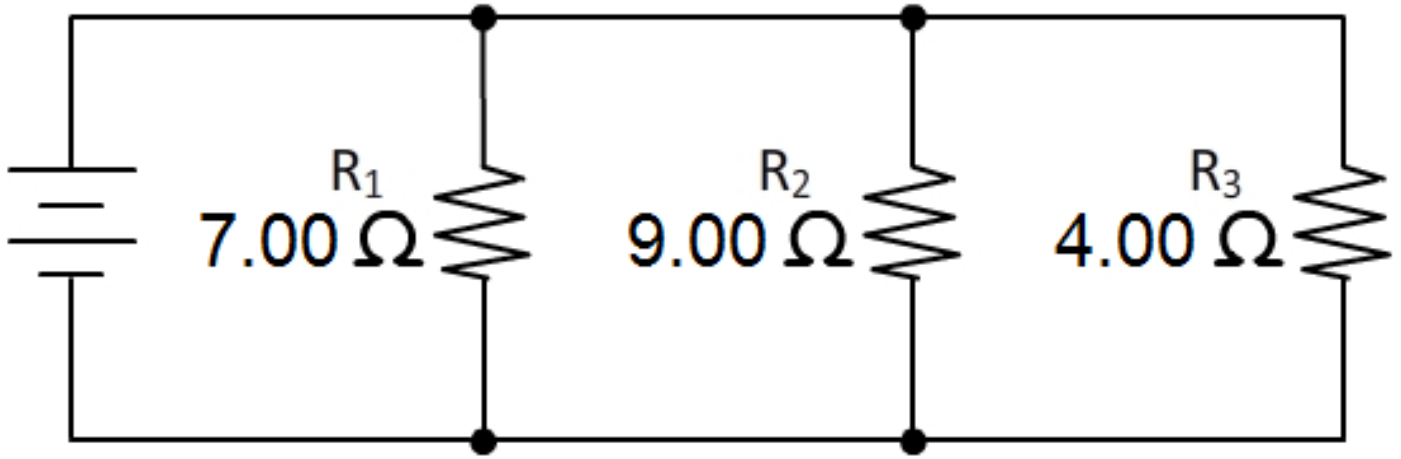
.Find the equivalent resistance of the circuit

A. 0.5 Ω

B. 20 Ω

C. 1.98 Ω

D. 0.05 Ω



$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$ ← لانه توصيل على التوازي

$\frac{1}{7} + \frac{1}{9} + \frac{1}{4} = 0.5039\ldots$

نضغط x^{-1} بعدين يساوي بالالة الحاسبة = 1.98

Question 2

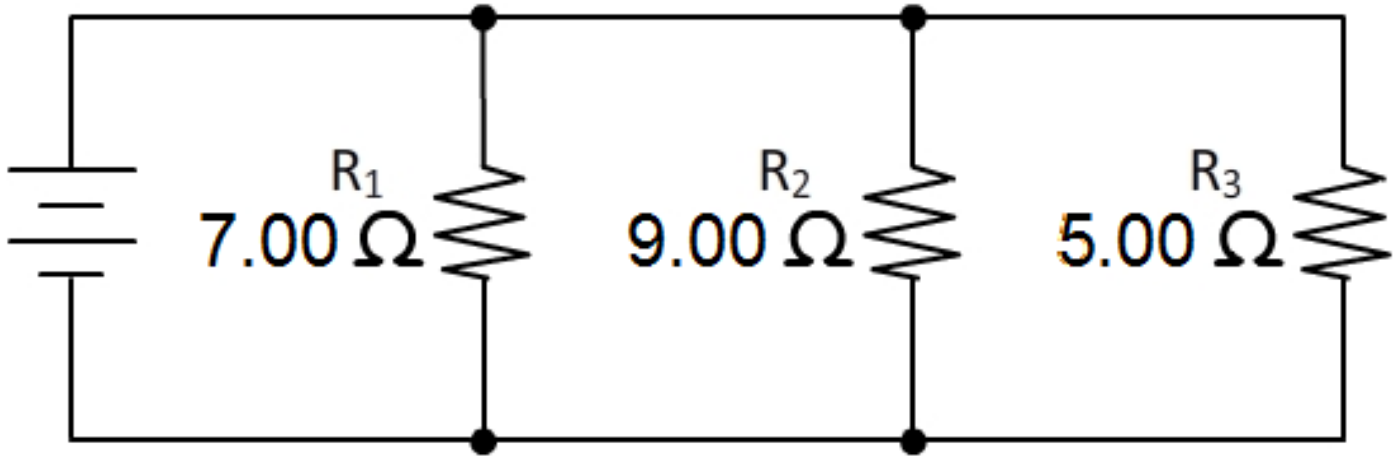
.Find the equivalent resistance of the circuit

A. 2.2 Ω

B. 21 Ω

C. 0.45 Ω

D. 0.05 Ω



→ نفس طريقة السؤال السابق

Question 3

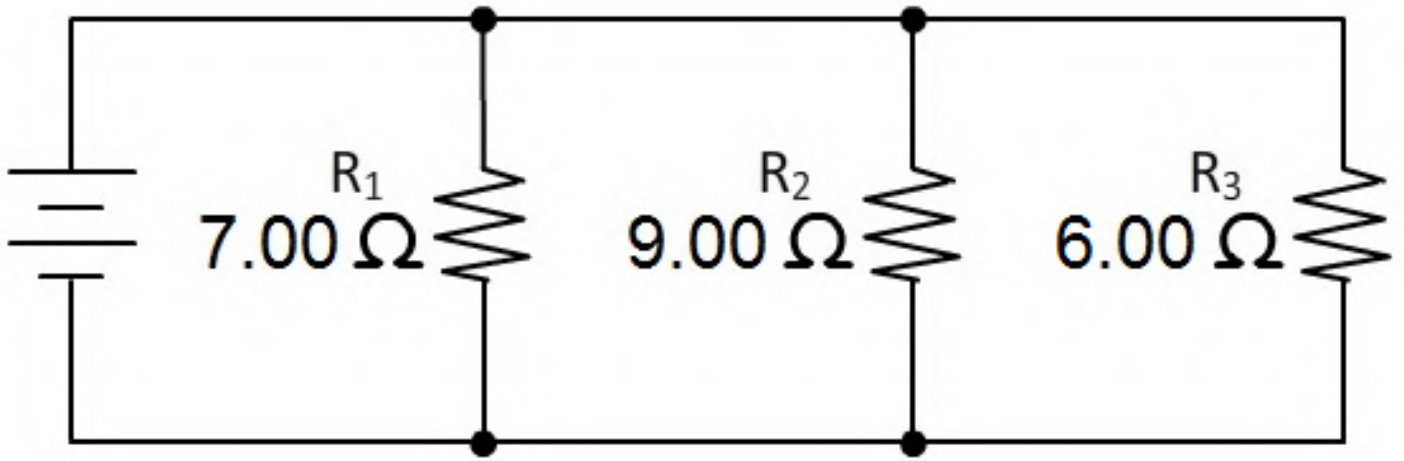
.Find the equivalent resistance of the circuit

A. 22 Ω

B. 2.37 Ω

C. 0.42 Ω

D. 0.04 Ω



→ نفس طريقة الاسئله السابقة

Question 4

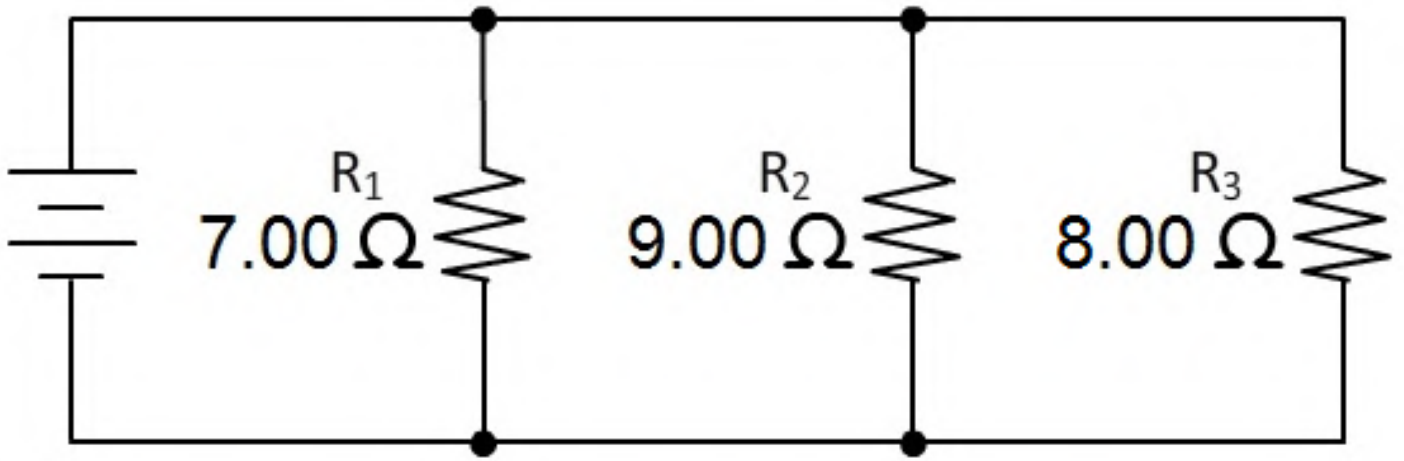
.Find the equivalent resistance of the circuit

A. 0.04 Ω

B. 24 Ω

C. 0.38 Ω

D. 2.64 Ω



→ نفس طريقة الاسئلة السابقة

Question 5

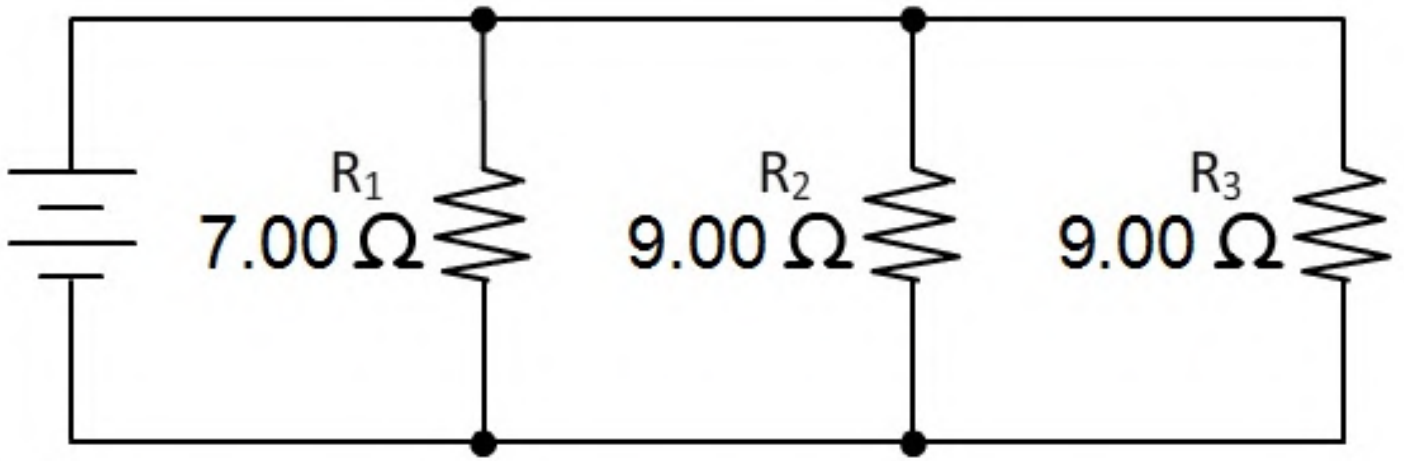
.Find the equivalent resistance of the circuit

A. 25 Ω

Ω 2.74 .B

Ω 0.37 .C

Ω 0.033 .D



نفس طريقة الاسئلة السابقة

Question 6

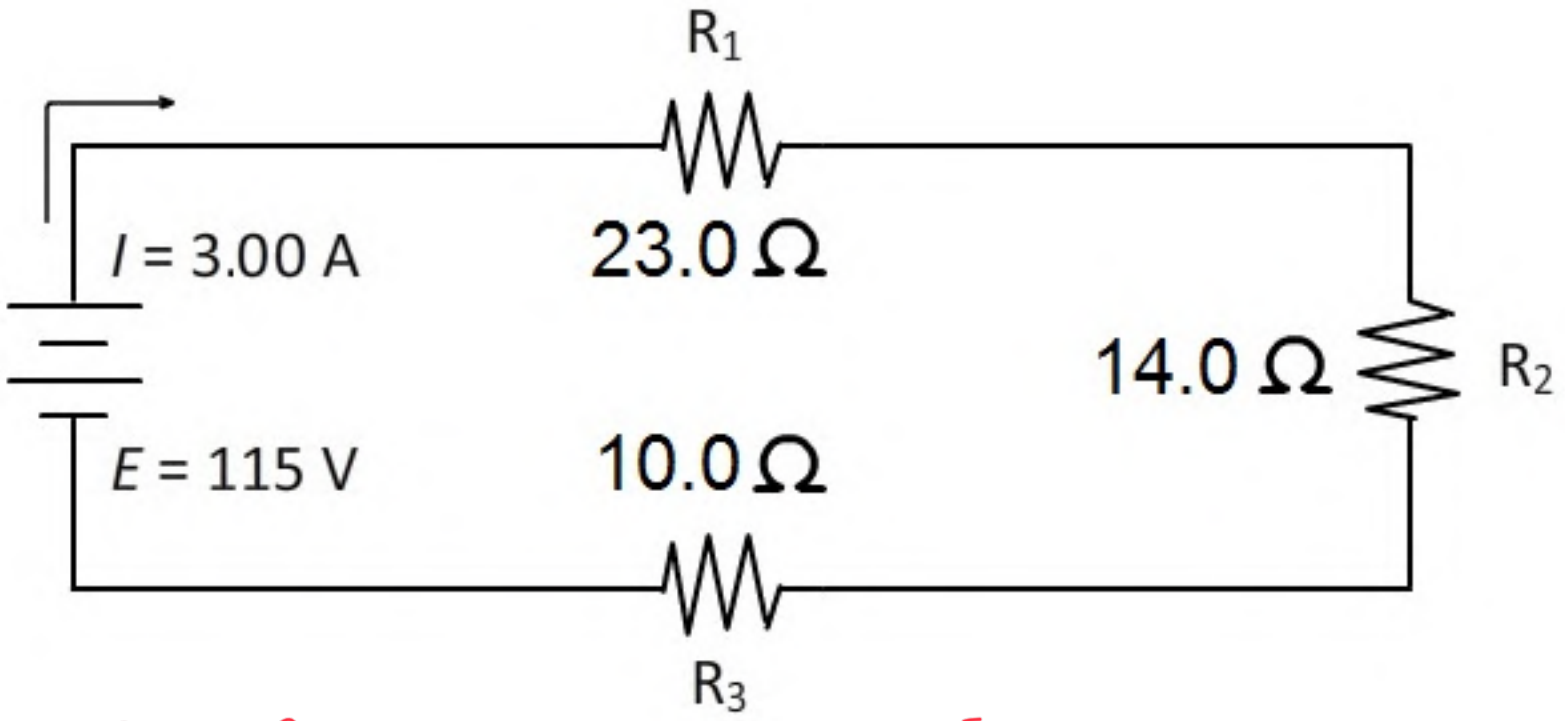
.Find the equivalent resistance of the circuit

A. 4.65 Ω

B. 47 Ω

C. 0.21 Ω

D. 0.021 Ω



$R = R_1 + R_2 + R_3$ لانه توصيل على التوالي

$23 + 10 + 14 = 47\ \Omega$

Question 7

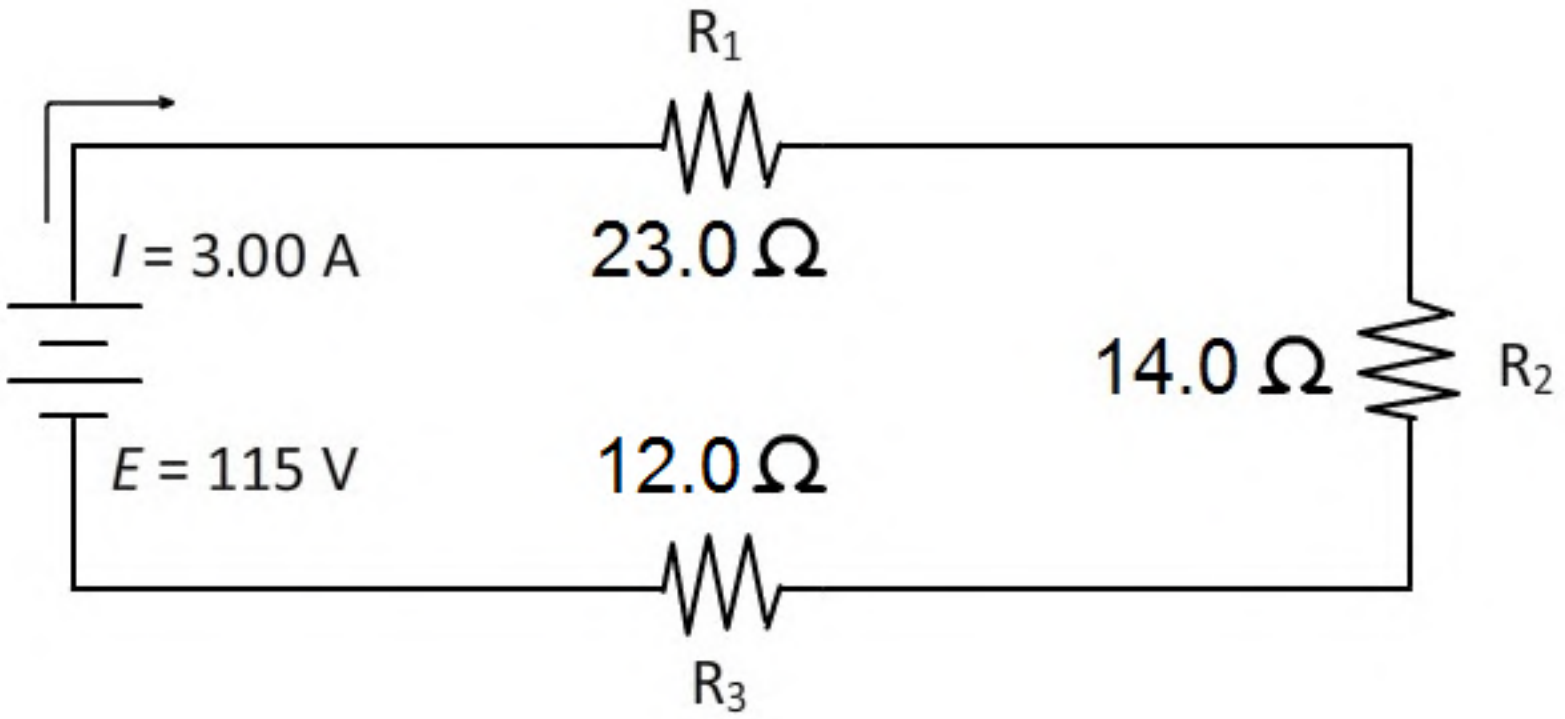
.Find the equivalent resistance of the circuit

A. 5.04 Ω

B. 0.20 Ω

C. 49 Ω

D. 0.020 Ω



نفس طريقة السؤال السابق

Question 8

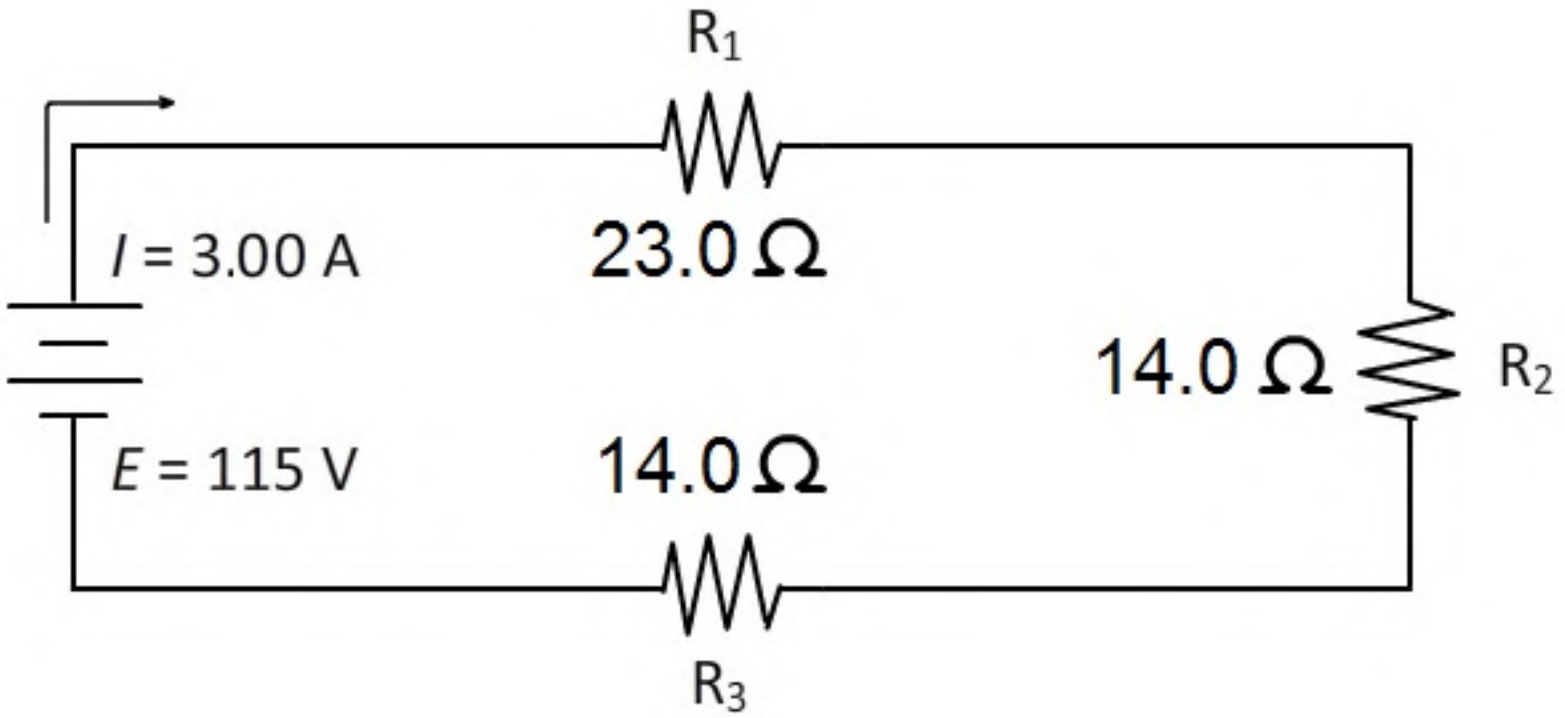
.Find the equivalent resistance of the circuit

A. 5.37 Ω

B. 51 Ω

C. 0.19 Ω

D. 0.020 Ω



→ نفس طريقة الاسئلة السابقة

Question 9

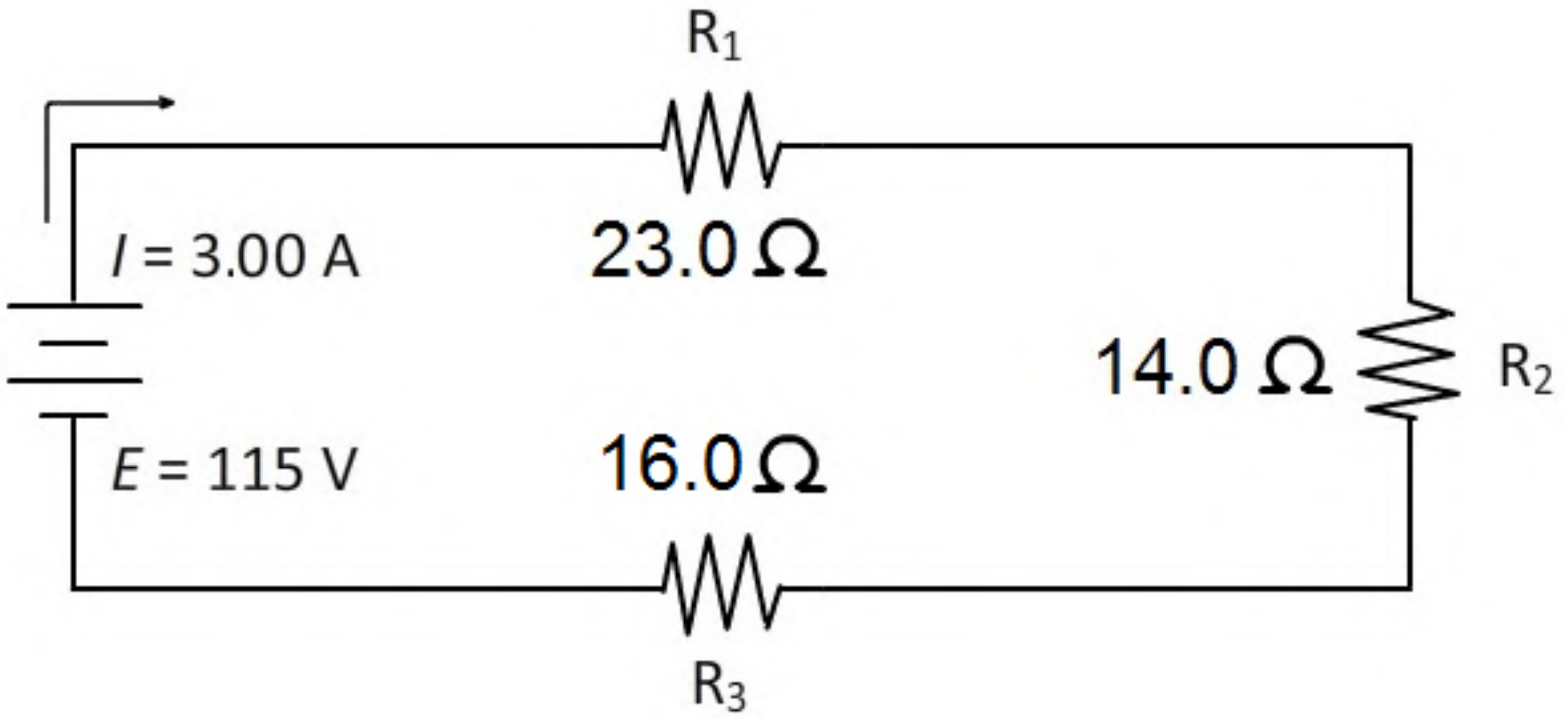
.Find the equivalent resistance of the circuit

A. 5.64 Ω

B. 0.019 Ω

C. 0.18 Ω

D. 53 Ω



→ نفس طريقة الاسئلة السابقة

Question 10

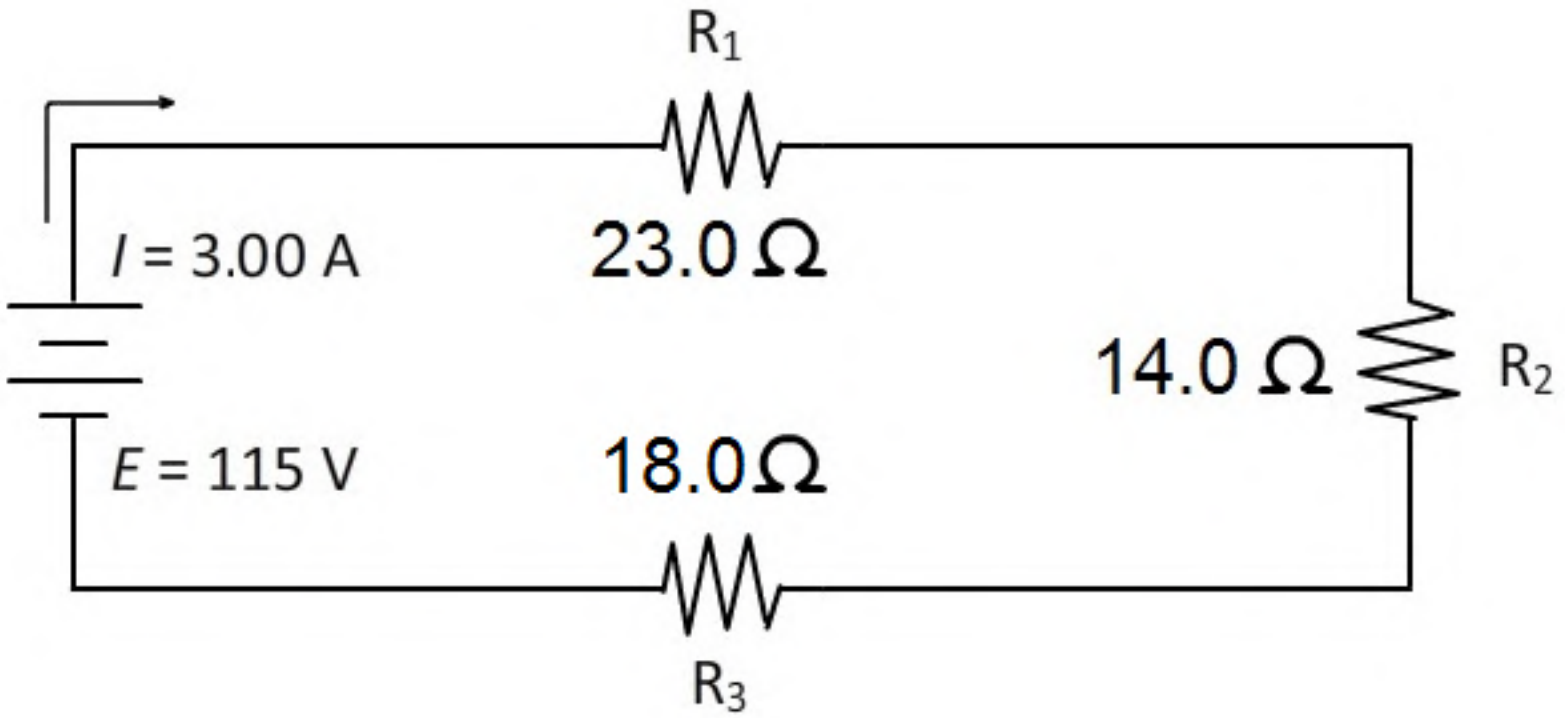
.Find the equivalent resistance of the circuit

A. 55 Ω

B. 0.17 Ω

C. 5. 87 Ω

D. 0.018 Ω



نفس طريقة الاسئلة السابقة ⟵

Assessment

Physics: Lesson 22

Question 1

:Electromagnetic waves are composed of which of the following

A. Changing electric and magnetic fields

B. Changing electric fields only

C. Changing magnetic fields only

D. Static electric or magnetic fields

Question 2

مرتبه

Which of the following is ranked in order from largest wavelength to .smallest

A. Radio, Microwave, Infrared, Gamma, X ray

B. Radio, Infrared, Microwave , X ray, Gamma

C. Radio, Microwave, Infrared, X ray, Gamma

D. Microwave, Radio, Infrared, X ray, Gamma

Question 3

:In an electromagnetic wave, the electric and magnetic fields are

A. parallel to each other and perpendicular to the direction of motion

B. parallel to each other and to the direction of motion

C. perpendicular to each other and parallel to the direction of motion

D. perpendicular to each other and to the direction of motion

Question 4

:A wave’s frequency is

A. the time duration for one complete wave

B. the number of waves repeating every second

C. the maximum value of a wave

D. the length of a single wave

Question 5

If we move from left to right in the electromagnetic spectrum, what ?will happen

A. both wavelength and frequency increase

B. both wavelength and frequency decrease

C. wavelength decreases and frequency increases

D. wavelength increases and frequency decreases

Question 6

.Find the distance a gamma wave travels in 0.01 secs

A. 3×10^4 m

B. 3×10^5 m

C. 3×10^6 m

D. 3×10^3 m

$s = ct$

$s = (3 \times 10^8) \times 0.01 = 3000000 = 3 \times 10^6$

Question 7

.Find the distance an X ray wave travels in 0.01 secs

A. 3×10^6 m

B. 3×10^5 m

C. 3×10^4 m

D. 3×10^3 m

نفس السؤال السابق لان الموجات
الكهرومغناطيسية لها نفس
السرعة : $c = 3 \times 10^8$

Question 8

.Find the distance a gamma wave travels in 0.001 secs

A. 3×10^6 m

B. 3×10^3 m

C. 3×10^4 m

D. 3×10^5 m

$s = ct$

$= 3 \times 10^8 \times 0.001$

$= 300000$

Question 9

.Find the wavelength of a wave that has a frequency of 2.5×10^7 Hz

$$C = \lambda f$$

$$\lambda = \frac{C}{f} = \frac{3 \times 10^8}{2.5 \times 10^7} = 12$$

A. 10 m

B. 11 m

C. 12 m

D. 13 m

Question 10

.Find the frequency of a wave that has a wavelength of 3.0×10^{-2} m

A. 1×10^{12} Hz

B. 1×10^{10} Hz

C. 1×10^{8} Hz

D. 1×10^{3} Hz

$$c = \lambda f$$

$$f = \frac{c}{\lambda} = \frac{3 \times 10^{8}}{3 \times 10^{-2}} = 1 \times 10^{10}$$

Assessment

Physics: Lesson 23

Question 1

?How many types of reflections are there

1 .A

2 .B

3 .C

4 .D

Question 2

The law of reflection states that the angel of reflection is _____ .the angle of incidence

A. equal to

B. unequal to

C. greater than

D. less than

Question 3

Which of the following is not true of the image formed by a plane mirror:

* خيالية - معتدلة - نفس الحجم *

A. The image is virtual

B. The image is the same size as you are

C. The image is located as far behind the mirror as you are in front of it.

D. The image is inverted

Question 4

.A _____ image has a negative value for s_i

inverted .A

real .B

virtual .C

non inverted .D

Question 5

An object 5.00 cm (s_o) in front of a convex mirror forms an image 2.0 cm (s_i) behind the mirror. What is the focal length of the mirror?

حيالية ⟸ ناخذ si بالسالبه

$$\frac{1}{f} = \frac{1}{si} + \frac{1}{so}$$

$$\frac{1}{f} = \frac{1}{-2} + \frac{1}{5} = -0.3 \rightarrow \boxed{x^{-1}} \text{ نضغط متتاع بالحاسبه} \rightarrow -3.33$$

A. 3.33 cm

B. 1.43 cm

C. −3.33 cm

D. 0.33 cm

Question 8

An object 5.0 (s_o) cm in front of a concave mirror forms an image 10.00 (s_i) ?cm in front of the mirror. What is the focal length of the mirror

A. 0.30 cm

B. 10.0 cm

C. −10.0 cm

D. 3.33 cm

نفس طريقة السؤال السابق لكن ناخذ الـ si

* بالموجب لان الصورة حقيقية أمام المرآة

$$\frac{1}{f} = \frac{1}{5} + \frac{1}{10} = 0.3 \Rightarrow \boxed{x^{-1}} \Rightarrow 3.33$$

Question 10

:You can see the road ahead of your car at night because of

diffuse reflection .A

absorption .B

specular reflection .C

refraction .D

Question 6

An object 5.00 cm (So) in front of a convex mirror forms an image 3.0 cm (Si) behind the mirror. What is the focal length of the mirror?

↳ Si سالب

A. −7.5 cm

B. 1.88 cm

C. 7.5 cm

D. 0.133 cm

$$\frac{1}{f} = \frac{1}{si} + \frac{1}{so}$$

$$\frac{1}{f} = \frac{1}{-3} + \frac{1}{5} = -0.133 \rightarrow \boxed{x^{-1}} \rightarrow -7.5$$

Question 7

so

si

An object 5.00 cm in front of a convex mirror forms an image 4.0 cm behind the mirror. What is the focal length of the mirror?

الصور خيالية ← نأخذ si بالسالب

A. 0.05 cm

B. 2.22 cm

C. 20 cm

D. −20 cm

$$\frac{1}{f} = \frac{1}{si} + \frac{1}{so}$$

$$\frac{1}{f} = \frac{1}{-4} + \frac{1}{5} = -0.05 \rightarrow \boxed{x^{-1}} \longrightarrow -20$$

Question 9

An object 5.0 (s_o) cm in front of a concave mirror forms an image 12.00 (s_i) cm in front of the mirror. What is the focal length of the mirror?

+ s_i ← قيمة موجبة

A. −3.53 cm

B. 8.57 cm

C. 3.53 cm

D. 0.283 cm

$$\frac{1}{f} = \frac{1}{s_o} + \frac{1}{s_i}$$

$$\frac{1}{f} = \frac{1}{5} + \frac{1}{12} = 0.283 \rightarrow [x^{-1}] \rightarrow 3.53$$