THIS IS THE ANSWER AND SOLUTION FOR
PAPER NUMBER 26

THIS IS AN EXAMPLE OF PERSONALIZED TESTS.

If needed, please use the following constants.

Constant	Symbol	Value
Acceleration due to earth's gravity	g	9.80 m/s^2
Avogadro's number	N_A	6.0221367×10^{23} mol^{-1}
Boltzmann's constant	k	1.380658×10^{-23} J/K
Coulomb's constant	k	8.99×10^{9} N·m^2/C^2
Electron charge magnitiude	e	$1.60217733 \times 10^{-19}$ C
Permeability of free space	μ_0	$1.25663706 \times 10^{-6}$ T·m/A
Permittivity of free space	ϵ_0	$8.854187817 \times 10^{-12}$ C^2/(N·m^2)
Pi	π	3.14159265
Planck's constant	h	$6.6260755 \times 10^{-34}$ J·s
Mass of electron	m_e	$9.1093897 \times 10^{-31}$ kg

Constant	Symbol	Value
Mass of neutron	m_n	$1.6749286 \times 10^{-27}$ kg
Mass of proton	m_p	$1.6726231 \times 10^{-27}$ kg
Speed of light in vacuum	c	299792458. m/s
Universal gravitational constant	G	6.67259×10^{-11} N·m^2/kg^2
Universal gas constant	R	8.314510 J/(mol·K)

Please be advised that in this paper there are questions from 26.1 through 26.9. And any one of them may contain more than one sub-question, thus the total number of sub-questions here is around 14, of which 13 should be answered.

In this paper, big questions will be generated in the following order:
1 (6) , 2 (5) , 3 (3) , 4 (2) , 5 (1) , 6 (4) , 7 (7) , 8 (8) , 9 (9) .

QUESTION 26.1 (6)
Please answer ONLY 5 of the following 6

questions (Questions 26.1.1 through 26.1.6).

Here are still some constants for use in the following questions:

Constant	Symbol	Value
Boltzmann's constant	k	1.381×10^{-23} J/K
Avogadro's number	N_A	6.022×10^{23} mol^{-1}
Mass of electron	m_e	$9.1093897 \times 10^{-31}$ kg

In this big question of CHOOSE structure, 6 questions will be generated:

1 (10 , 25) , 2 (11 , 26) , 3 (13 , 28) , 4 (9 , 24) , 5 (8 , 23) , 6 (7 , 22) .

Question 26.1.1 (6 , 10 , 25)

Auto-answer:

D. A truck
E. An airplane

Question 26.1.2 (6 , 11 , 26)

Solution:

Since the possiblity of non-smoking customer is $a = 0.270$, and the possiblity of equal or above 30 years old customer is $b = 0.5200$, the possiblity of smoking customer is $c = 1.0 - a = 1.0 - 0.270 = 0.730$ and the possiblity of under 30 years old customer is $d = 1.0 - b = 1.0 - 0.5200 = 0.4800$. So the possibility of smoking and under 30 years old customer is $c \times d = 0.350$.

Answer:

The possibility of smoking and under 30 years old customer is $(1-a)(1-b) = 0.350$.

Question 26.1.3 (6 , 13 , 28)

Answer:

3;
2;
The operation is ADDITION and the result is 5.0000.

Question 26.1.4 (6 , 9 , 24)

Solution:

By using Newton's Law of Universal Gravitation:

$$F = G\frac{(Sun's\ \ mass) \times (Planet's\ \ mass)}{(distance)^2},$$

where $G = 6.67 \times 10^{-11} Nm^2(kg)^{-2}$, the forces can be easily calculated as

The Planet	Mass (kg)	Distanace from Sun (m)	The Force (N)
Mercury	$2.00000000 \times 10^{24}$	$5.000000000 \times 10^{24}$	3.74×10^{-11}
Venus	8.00×10^{24}	6.00×10^{24}	1.04×10^{-10}
Earth	9.00×10^{24}	3.00×10^{24}	4.67×10^{-10}
Mars	9.00×10^{24}	4.00×10^{24}	2.63×10^{-10}
Jupiter	2.00×10^{24}	3.00×10^{24}	1.04×10^{-10}
Saturn	9.00×10^{24}	6.00×10^{24}	1.17×10^{-10}
Uranus	8.00×10^{24}	7.00×10^{24}	7.62×10^{-11}
Neptune	5.00×10^{24}	4.00×10^{24}	1.46×10^{-10}

Answer:

By using Newton's Law of Universal Gravitation:

$$F = G\frac{(Sun's\ \ mass) \times (Planet's\ \ mass)}{(distance)^2},$$

where $G = 6.67 \times 10^{-11} Nm^2(kg)^{-2}$, the forces can be easily calculated as

The Planet	Mass (kg)	Distanace from Sun (m)	The Force (N)
Mercury	$2.00000000 \times 10^{24}$	$5.000000000 \times 10^{24}$	3.74×10^{-11}
Venus	8.00×10^{24}	6.00×10^{24}	1.04×10^{-10}
Earth	9.00×10^{24}	3.00×10^{24}	4.67×10^{-10}
Mars	9.00×10^{24}	4.00×10^{24}	2.63×10^{-10}
Jupiter	2.00×10^{24}	3.00×10^{24}	$1.04 \times 10^{-10}3$
Saturn	9.00×10^{24}	6.00×10^{24}	1.17×10^{-10}
Uranus	8.00×10^{24}	7.00×10^{24}	7.62×10^{-11}
Neptune	5.00×10^{24}	4.00×10^{24}	1.46×10^{-10}

Question 26.1.5 (6 , 8 , 23)

Auto-answer:

D. The accelaration is $(1.5385ms^{-2}, 5.7692 \times 10^{-2}ms^{-2}, -747692.km/h^2)$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (80.0, 3.0, -3000.0)N$ and $m = 52.0kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(80.0, 3.0, -3000.0)N}{52.0kg} \\
&= (1.5385, 5.7692 \times 10^{-2}, -57.692)ms^{-2} \\
&= (19938., 747.69, -747692.)km/h^2.
\end{aligned}$$

Question 26.1.6 (6 , 7 , 22)

Auto-answer:

D. The accelaration (vector) is $(20829., 462.86, -1.6200 \times 10^6)km/h^2$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (90.0, 2.0, -7000.0)N$ and $m = 56.0kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(90.0, 2.0, -7000.0)N}{56.0kg} \\
&= (1.6071, 3.5714 \times 10^{-2}, -125.00)ms^{-2} \\
&= (20829., 462.86, -1.6200 \times 10^6)km/h^2.
\end{aligned}$$

You have done all the above? A very good beginning, please go ahead.

More constants the Mass of electron m_e= 9.109390×10^{-31} kg , Universal gas constant R= 8.315 J/(mol·K) , e= $1.60217733 \times 10^{-19}$ C , and m_p= $1.6726231 \times 10^{-27}$ kg may be very helpful.

QUESTION 26.2 (5 , 5 , 5)

Answer:

The correct answer	T

1. 96 is an even number.

The correct answer	T

2. Toronto is in Ontario province.

The correct answer	F

3. $|\mathbf{F}| = Gm_1m_2r^{-2}$ is a mathmatical form of the Newton's Second Law.

QUESTION 26.3 (3 , 3 , 3)

Auto-answer:

F. None of above.

QUESTION 26.4 (2 , 2 , 2)

Auto-answer:

G. None of these.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (30.000, 3.0000, -9000.0)N$ and $m = 52.0000kg$, bring them into the above equation, then we get

$$
\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(30.000, 3.0000, -9000.0)N}{52.0000kg} \\
&= (0.57692, 5.7692 \times 10^{-2}, -173.08)ms^{-2} \\
&= (7476.9, 747.69, -2.2431 \times 10^{6})km/h^{2}.
\end{aligned}
$$

QUESTION 26.5 (1 , 1 , 1)

Auto-answer:

F. The accelaration is $(0.370, 0.13, -166.67)ms^{-2}$.

Answer:

The correct answer from the choices is

F. The accelaration is $(0.370, 0.13, -166.67)ms^{-2}$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (20.0, 7.0, -9000.0)N$ and $m = 54.0000kg$, bring them into the above equation, then we get

$$
\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(20.0, 7.0, -9000.0)N}{54.0000kg} \\
&= (0.370, 0.13, -166.67)ms^{-2}
\end{aligned}
$$

QUESTION 26.6 (4 , 4 , 4)

Auto-answer:

Column Left	Column Right	Answers
A. A	a	**A.**
B. C	eR	**C.** , **D.**
C. er	ER	**C.** , **D.**
D. Er	c	**B.**
E. asdf(:)	ASDF(:)	**E.**

You have done all the above? Excellent! Not much left, please continue.

QUESTION 26.7 (7 , 14 , 50)

Auto-answer:

A. The accelaration is $(1.67, 0.17, -92.593)ms^{-2}$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (90.0, 9.0, -5000.0)N$ and $m = 54.0kg$, bring them into the above equation, then we get

$$\begin{aligned} \mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(90.0, 9.0, -5000.0)N}{54.0kg} \\ &= (1.67, 0.17, -92.593)ms^{-2} \end{aligned}$$

QUESTION 26.8 (8 , 15 , 60)

Answer:

$$\begin{pmatrix} 4 & 7 & 5 & 4 \\ 4 & 4 & 4 & 4 \\ 5 & 6 & 5 & 5 \end{pmatrix} \times \begin{pmatrix} 2 \\ 2 \\ 2 \\ 2 \end{pmatrix} = \begin{pmatrix} 40 \\ 32 \\ 42 \end{pmatrix}$$

$$\begin{pmatrix} \Theta & \zeta \\ \Phi & \eta \\ \Theta & \Upsilon \\ \Delta & \Xi \end{pmatrix} \begin{pmatrix} \beta \\ \gamma \end{pmatrix} = \begin{pmatrix} \Theta \times \beta + \zeta \times \gamma \\ \Phi \times \beta + \eta \times \gamma \\ \Theta \times \beta + \Upsilon \times \gamma \\ \Delta \times \beta + \Xi \times \gamma \end{pmatrix}$$

Solution:

QUESTION 26.9 (9 , 16 , 70)

Answer:

-7, -7

Solution:

Roots to the equation

$$-11 \times x^2 - 154 \times x - 539 = 0$$

are -7 and -7 .

Let us verity -7 first: $-11 \times x^2 - 154 \times x - 539 = -539 + (1078) + (-539) = 539 + (-539) = 0$

Then verity -7: $-11 \times x^2 - 154 \times x - 539 = -539 + (1078) + (-539) = 539 + (-539) = 0$

Here are still some constants for use:

Constant	Symbol	Value
Mass of proton	m_p	$1.6726231 \times 10^{-27}$ kg
Boltzmann's constant	k	1.381×10^{-23} J/K

Thank you very much for answering these questions!

Please be advised that in this paper there are questions from 26.1 through 26.9. And any one of them may contain more than one sub-question, thus the total number of sub-questions here is around 14, of which 13 should be answered.

***** END OF PAPER, THANKS *****

By: 239 (26 , 34)

THIS IS THE ANSWER AND SOLUTION FOR PAPER NUMBER 27

THIS IS AN EXAMPLE OF PERSONALIZED TESTS.

If needed, please use the following constants.

Constant	Symbol	Value
Acceleration due to earth's gravity	g	9.80 m/s^2
Avogadro's number	N_A	6.0221367×10^{23} mol^{-1}
Boltzmann's constant	k	1.380658×10^{-23} J/K
Coulomb's constant	k	8.99×10^9 N·m^2/C^2
Electron charge magnitiude	e	$1.60217733 \times 10^{-19}$ C
Permeability of free space	μ_0	$1.25663706 \times 10^{-6}$ T·m/A
Permittivity of free space	ϵ_0	$8.854187817 \times 10^{-12}$ C^2/(N·m^2)
Pi	π	3.14159265
Planck's constant	h	$6.6260755 \times 10^{-34}$ J·s
Mass of electron	m_e	$9.1093897 \times 10^{-31}$ kg

Constant	Symbol	Value
Mass of neutron	m_n	$1.6749286 \times 10^{-27}$ kg
Mass of proton	m_p	$1.6726231 \times 10^{-27}$ kg
Speed of light in vacuum	c	299792458. m/s
Universal gravitational constant	G	6.67259×10^{-11} N·m^2/kg^2
Universal gas constant	R	8.314510 J/(mol·K)

Please be advised that in this paper there are questions from 27.1 through 27.9. And any one of them may contain more than one sub-question, thus the total number of sub-questions here is around 14, of which 13 should be answered.

In this paper, big questions will be generated in the following order:
1 (6) , 2 (1) , 3 (3) , 4 (2) , 5 (4) , 6 (5) , 7 (8) , 8 (7) , 9 (9) .

QUESTION 27.1 (6)

Please answer ONLY 5 of the following 6

questions (Questions 27.1.1 through 27.1.6).

Here are still some constants for use in the following questions:

Constant	Symbol	Value
Boltzmann's constant	k	1.381×10^{-23} J/K
Avogadro's number	N_A	6.022×10^{23} mol^{-1}
Mass of electron	m_e	$9.1093897 \times 10^{-31}$ kg

In this big question of CHOOSE structure, 6 questions will be generated: 1 (6 , 21) , 2 (10 , 25) , 3 (7 , 22) , 4 (8 , 23) , 5 (13 , 28) , 6 (11 , 26) .

Question 27.1.1 (6 , 6 , 21)

Answer:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (40.0, 7.0, -7000.0)N$ and $m = 52.0kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(40.0, 7.0, -7000.0)N}{52.0kg} \\
&= (0.76923, 0.13462, -134.62)ms^{-2} \\
&= (9969.2, 1744.6, -1.7446 \times 10^{6})km/h^{2}.
\end{aligned}$$

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (40.0, 7.0, -7000.0)N$ and $m = 52.0kg$, bring them into the above equation, then we get

$$\begin{aligned}\mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(40.0, 7.0, -7000.0)N}{52.0kg} \\ &= (0.76923, 0.13462, -134.62)ms^{-2} \\ &= (9969.2, 1744.6, -1.7446 \times 10^6)km/h^2.\end{aligned}$$

Question 27.1.2 (6 , 10 , 25)

Auto-answer:

E. A truck

Question 27.1.3 (6 , 7 , 22)

Auto-answer:

K. The accelaration (vector) is $(6942.9, 1388.6, -1.3886 \times 10^6)km/h^2$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (30.0, 6.0, -6000.0)N$ and $m = 56.0kg$, bring them into the above equation, then we get

$$\begin{aligned}\mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(30.0, 6.0, -6000.0)N}{56.0kg} \\ &= (0.53571, 0.10714, -107.14)ms^{-2} \\ &= (6942.9, 1388.6, -1.3886 \times 10^6)km/h^2.\end{aligned}$$

Question 27.1.4 (6 , 8 , 23)

Auto-answer:

C. The accelaration is $(0.38462ms^{-2}, 0.11538ms^{-2}, -747692.km/h^2)$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (20.0, 6.0, -3000.0)N$ and $m = 52.0kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(20.0, 6.0, -3000.0)N}{52.0kg} \\
&= (0.38462, 0.11538, -57.692)ms^{-2} \\
&= (4984.6, 1495.4, -747692.)km/h^2.
\end{aligned}$$

Question 27.1.5 (6 , 13 , 28)

Answer:

7;
6;
The operation is MULTIPLICATION and the result is 42.000.

Question 27.1.6 (6 , 11 , 26)

Solution:

Since the possiblity of non-smoking customer is $a = 7.0 \times 10^{-2}$, and the possiblity of equal or above 30 years old customer is $b = 0.6800$, the possiblity of smoking customer is $c = 1.0 - a = 1.0 - 7.0 \times 10^{-2} = 0.930$ and the possiblity of under 30 years old customer is $d = 1.0 - b = 1.0 - 0.6800 = 0.3200$. So the possibility of smoking and under 30 years old customer is $c \times d = 0.298$.

Answer:

The possibility of smoking and under 30 years old customer is $(1-a)(1-b) = 0.298$.

You have done all the above? A very good beginning, please go ahead. More con-

stants the Mass of electron m_e= 9.109390×10^{-31} kg , Universal gas constant R= 8.315 J/(mol·K) , e= $1.60217733 \times 10^{-19}$ C , and m_p= $1.6726231 \times 10^{-27}$ kg may be very helpful.

QUESTION 27.2 (1 , 1 , 1)

Auto-answer:

A. The accelaration is $(0.690, 0.16, -120.69)ms^{-2}$.

Answer:

The correct answer from the choices is

A. The accelaration is $(0.690, 0.16, -120.69)ms^{-2}$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (40.0, 9.0, -7000.0)N$ and $m = 58.0000kg$, bring them into the above equation, then we get

$$\begin{aligned}\mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(40.0, 9.0, -7000.0)N}{58.0000kg} \\ &= (0.690, 0.16, -120.69)ms^{-2}\end{aligned}$$

QUESTION 27.3 (3 , 3 , 3)

Auto-answer:

E. Canada has 10 provinces and 3 territories.

QUESTION 27.4 (2 , 2 , 2)

Auto-answer:

A. The accelaration is $(0.74074ms^{-2}, 720.00km/h^2, -55.556ms^{-2})$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (40.000, 3.0000, -3000.0)N$ and $m = 54.0000kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(40.000, 3.0000, -3000.0)N}{54.0000kg} \\
&= (0.74074, 5.5556 \times 10^{-2}, -55.556)ms^{-2} \\
&= (9600.0, 720.00, -720000.)km/h^2.
\end{aligned}$$

QUESTION 27.5 (4 , 4 , 4)

Auto-answer:

Column Left	Column Right	Answers
A. C	eR	**D.** , **E.**
B. A= 2/ 2	a= 1	**B.**
C. yjh	ER	**D.** , **E.**
D. Er	YJH	**C.**
E. er	c	**A.**

QUESTION 27.6 (5 , 5 , 5)

Answer:

The correct answer	F	1. 22 is an odd number.
The correct answer	T	2. Toronto is in Ontario province.
The correct answer	T	3. $\mathbf{F} = m\mathbf{a}$ is a mathmatical form of the Newton's Second Law.

You have done all the above? Excellent! Not much left, please continue.

QUESTION 27.7 (8 , 15 , 60)

Answer:

$$\begin{pmatrix} 5 & 4 & 5 & 4 \\ 5 & 6 & 5 & 6 \\ 5 & 6 & 6 & 5 \end{pmatrix} \times \begin{pmatrix} 2 \\ 2 \\ 2 \\ 2 \end{pmatrix} = \begin{pmatrix} 36 \\ 44 \\ 44 \end{pmatrix}$$

$$\begin{pmatrix} \Phi & \Phi \\ \Gamma & \alpha \\ \varepsilon & \Gamma \\ \alpha & \sigma \end{pmatrix} \begin{pmatrix} \beta \\ \beta \end{pmatrix} = \begin{pmatrix} \Phi \times \beta + \Phi \times \beta \\ \Gamma \times \beta + \alpha \times \beta \\ \varepsilon \times \beta + \Gamma \times \beta \\ \alpha \times \beta + \sigma \times \beta \end{pmatrix}$$

Solution:

QUESTION 27.8 (7 , 14 , 50)

Auto-answer:

B. The accelaration is $(1.25, 0.11, -107.14)ms^{-2}$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (70.0, 6.0, -6000.0)N$ and $m = 56.0kg$, bring them into the above equation, then we get

$$\begin{aligned} \mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(70.0, 6.0, -6000.0)N}{56.0kg} \\ &= (1.25, 0.11, -107.14)ms^{-2} \end{aligned}$$

QUESTION 27.9 (9 , 16 , 70)

Answer:

25, 11

Solution:

Roots to the equation

$$7 \times x^2 - 252 \times x + 1925 = 0$$

are 25 and 11 .

Let us verity 25 first: $7 \times x^2 - 252 \times x + 1925 = 4375 + (-6300) + (1925) = -1925 + (1925) = 0$

Then verity 11: $7 \times x^2 - 252 \times x + 1925 = 847 + (-2772) + (1925) = -1925 + (1925) = 0$

Here are still some constants for use:

Constant	Symbol	Value
Mass of proton	m_p	$1.6726231 \times 10^{-27}$ kg
Boltzmann's constant	k	1.381×10^{-23} J/K

Thank you very much for answering these questions!

Please be advised that in this paper there are questions from 27.1 through 27.9. And any one of them may contain more than one sub-question, thus the total number of sub-questions here is around 14, of which 13 should be answered.

***** END OF PAPER, THANKS *****

By: 239 (26 , 34)

THIS IS THE ANSWER AND SOLUTION FOR PAPER NUMBER 28

THIS IS AN EXAMPLE OF PERSONALIZED TESTS.

If needed, please use the following constants.

Constant	Symbol	Value
Acceleration due to earth's gravity	g	9.80 m/s^2
Avogadro's number	N_A	6.0221367×10^{23} mol^{-1}
Boltzmann's constant	k	1.380658×10^{-23} J/K
Coulomb's constant	k	8.99×10^{9} $N{\cdot}m^2/C^2$
Electron charge magnitiude	e	$1.60217733 \times 10^{-19}$ C
Permeability of free space	μ_0	$1.25663706 \times 10^{-6}$ T·m/A
Permittivity of free space	ϵ_0	$8.854187817 \times 10^{-12}$ $C^2/(N{\cdot}m^2)$
Pi	π	3.14159265
Planck's constant	h	$6.6260755 \times 10^{-34}$ J·s
Mass of electron	m_e	$9.1093897 \times 10^{-31}$ kg

Constant	Symbol	Value
Mass of neutron	m_n	$1.6749286 \times 10^{-27}$ kg
Mass of proton	m_p	$1.6726231 \times 10^{-27}$ kg
Speed of light in vacuum	c	299792458. m/s
Universal gravitational constant	G	6.67259×10^{-11} $N{\cdot}m^2/kg^2$
Universal gas constant	R	8.314510 J/(mol·K)

Please be advised that in this paper there are questions from 28.1 through 28.9. And any one of them may contain more than one sub-question, thus the total number of sub-questions here is around 14, of which 13 should be answered.

In this paper, big questions will be generated in the following order:
1 (6) , 2 (5) , 3 (3) , 4 (2) , 5 (1) , 6 (4) , 7 (8) , 8 (7) , 9 (9) .

QUESTION 28.1 (6)
Please answer ONLY 5 of the following 6

questions (Questions 28.1.1 through 28.1.6).

Here are still some constants for use in the following questions:

Constant	Symbol	Value
Boltzmann's constant	k	1.381×10^{-23} J/K
Avogadro's number	N_A	6.022×10^{23} mol^{-1}
Mass of electron	m_e	$9.1093897 \times 10^{-31}$ kg

In this big question of CHOOSE structure, 6 questions will be generated: 1 (8 , 23) , 2 (7 , 22) , 3 (6 , 21) , 4 (13 , 28) , 5 (11 , 26) , 6 (12 , 27) .

Question 28.1.1 (6 , 8 , 23)

Auto-answer:

E. none of these.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (80.0, 6.0, -7000.0)N$ and $m = 58.0kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(80.0, 6.0, -7000.0)N}{58.0kg} \\
&= (1.3793, 0.10345, -120.69)ms^{-2} \\
&= (17876., 1340.7, -1.5641 \times 10^6)km/h^2.
\end{aligned}$$

Question 28.1.2 (6 , 7 , 22)

Auto-answer:

H. The accelaration (vector) is $(7200.0, 480.00, -2.1600 \times 10^6)km/h^2$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (30.0, 2.0, -9000.0)N$ and $m = 54.0kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(30.0, 2.0, -9000.0)N}{54.0kg} \\
&= (0.55556, 3.7037 \times 10^{-2}, -166.67)ms^{-2} \\
&= (7200.0, 480.00, -2.1600 \times 10^{6})km/h^{2}.
\end{aligned}$$

Question 28.1.3 (6 , 6 , 21)

Answer:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (50.0, 4.0, -6000.0)N$ and $m = 58.0kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(50.0, 4.0, -6000.0)N}{58.0kg} \\
&= (0.86207, 6.8966 \times 10^{-2}, -103.45)ms^{-2} \\
&= (11172., 893.79, -1.3407 \times 10^{6})km/h^{2}.
\end{aligned}$$

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (50.0, 4.0, -6000.0)N$ and $m = 58.0kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(50.0, 4.0, -6000.0)N}{58.0kg} \\
&= (0.86207, 6.8966 \times 10^{-2}, -103.45)ms^{-2} \\
&= (11172., 893.79, -1.3407 \times 10^{6})km/h^{2}.
\end{aligned}$$

Question 28.1.4 (6 , 13 , 28)

Answer:

5;
8;
The operation is SUBTRACTION and the result is -3.0000.

Question 28.1.5 (6 , 11 , 26)

Solution:

Since the possiblity of smoking customer is $a = 0.600$, and the possiblity of equal or above 30 years old customer is $b = 0.9800$, the possiblity of non-smoking customer is $c = 1.0 - a = 1.0 - 0.600 = 0.400$ and the possiblity of under 30 years old customer is $d = 1.0 - b = 1.0 - 0.9800 = 2.000 \times 10^{-2}$. So the possibility of non-smoking and under 30 years old customer is $c \times d = 8.00 \times 10^{-3}$.

Answer:

The possibility of non-smoking and under 30 years old customer is $(1 - a)(1 - b) = 8.00 \times 10^{-3}$.

Question 28.1.6 (6 , 12 , 27)

Solution:

Since the possiblity of non-smoking customer is $a = 0.770$, and the possiblity of equal-or-above 30 years old customer is $b = 0.1400$, the possiblity of smoking customer is $c = 1.0 - a = 1.0 - 0.770 = 0.230$ and the possiblity of under 30 years old customer is $d = 1.0 - b = 1.0 - 0.1400 = 0.8600$. Then

Customer	Possibility
smoking and equal-or-above 30 years old	$0.230 \times 0.1400 = 3.22 \times 10^{-2}$
smoking and under 30 years old	$0.230 \times 0.8600 = 0.198$
non-smoking and equal-or-above 30 years old	$0.770 \times 0.1400 = 0.108$
non-smoking and under 30 years old	$0.770 \times 0.8600 = 0.662$

And the total summation of all possibilities is 1.000.

Answer:

Customer	Possibility
smoking and equal-or-above 30 years old	3.22×10^{-2}
smoking and under 30 years old	0.198
non-smoking and equal-or-above 30 years old	0.108
non-smoking and under 30 years old	0.662

And the total summation of all possibilities is 1.000.

You have done all the above? A very good beginning, please go ahead. More constants the Mass of electron m_e= 9.109390×10^{-31} kg , Universal gas constant R= 8.315 J/(mol·K) , e= $1.60217733 \times 10^{-19}$ C , and m_p= $1.6726231 \times 10^{-27}$ kg may be very helpful.

QUESTION 28.2 (5 , 5 , 5)

Answer:

The correct answer	F	1. 53 is an even number.
The correct answer	T	2. Kingston is in Ontario province.
The correct answer	F	3. $|\mathbf{F}| = Gm_1m_2r^{-2}$ is a mathmatical form of the Newton's Second Law.

QUESTION 28.3 (3 , 3 , 3)

Auto-answer:

D. Canada has 10 provinces and 3 territories.

QUESTION 28.4 (2 , 2 , 2)

Auto-answer:

G. None of these.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (80.000, 7.0000, -9000.0)N$ and $m = 52.0000kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(80.000, 7.0000, -9000.0)N}{52.0000kg} \\
&= (1.5385, 0.13462, -173.08)ms^{-2} \\
&= (19938., 1744.6, -2.2431 \times 10^6)km/h^2.
\end{aligned}$$

QUESTION 28.5 (1 , 1 , 1)

Auto-answer:

G. The accelaration is $(1.60, 0.18, -140.00)ms^{-2}$.

Answer:

The correct answer from the choices is

G. The accelaration is $(1.60, 0.18, -140.00)ms^{-2}$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (80.0, 9.0, -7000.0)N$ and $m = 50.0000kg$, bring them into the above equation, then we get

$$\begin{aligned}\mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(80.0, 9.0, -7000.0)N}{50.0000kg} \\ &= (1.60, 0.18, -140.00)ms^{-2}\end{aligned}$$

QUESTION 28.6 (4 , 4 , 4)

Auto-answer:

Column Left	Column Right	Answers
A. C	YJH	**D.**
B. Er	eR	**B.** , **E.**
C. A	ER	**B.** , **E.**
D. yjh	a	**C.**
E. er	c	**A.**

You have done all the above? Excellent! Not much left, please continue.

QUESTION 28.7 (8 , 15 , 60)

Answer:

$$\begin{pmatrix} 5 & 5 & 5 & 7 \\ 4 & 6 & 6 & 6 \\ 6 & 6 & 6 & 5 \end{pmatrix} \times \begin{pmatrix} 2 \\ 2 \\ 2 \\ 2 \end{pmatrix} = \begin{pmatrix} 44 \\ 44 \\ 46 \end{pmatrix}$$

$$\begin{pmatrix} \eta & \Phi \\ \sigma & \Delta \\ \Psi & \Psi \\ \Gamma & \sigma \end{pmatrix} \begin{pmatrix} \beta \\ \gamma \end{pmatrix} = \begin{pmatrix} \eta \times \beta + \Phi \times \gamma \\ \sigma \times \beta + \Delta \times \gamma \\ \Psi \times \beta + \Psi \times \gamma \\ \Gamma \times \beta + \sigma \times \gamma \end{pmatrix}$$

Solution:

QUESTION 28.8 (7 , 14 , 50)

Auto-answer:

C. The accelaration is $(1.43, 0.11, -71.429)ms^{-2}$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (80.0, 6.0, -4000.0)N$ and $m = 56.0kg$, bring them into the above equation, then we get

$$\begin{aligned}\mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(80.0, 6.0, -4000.0)N}{56.0kg} \\ &= (1.43, 0.11, -71.429)ms^{-2}\end{aligned}$$

QUESTION 28.9 (9 , 16 , 70)

Answer:

17, 32

Solution:

Roots to the equation

$$-11 \times x^2 + 539 \times x - 5984 = 0$$

are 17 and 32 .

Let us verity 17 first: $-11 \times x^2 + 539 \times x - 5984 = -3179 + (9163) + (-5984) = 5984 + (-5984) = 0$

Then verity 32: $-11 \times x^2 + 539 \times x - 5984 = -11264 + (17248) + (-5984) = 5984 + (-5984) = 0$

Here are still some constants for use:

Constant	Symbol	Value
Mass of proton	m_p	$1.6726231 \times 10^{-27}$ kg
Boltzmann's constant	k	1.381×10^{-23} J/K

Thank you very much for answering these questions!

Please be advised that in this paper there are questions from 28.1 through 28.9. And any one of them may contain more than one sub-question, thus the total number of sub-questions here is around 14, of which 13 should be answered.

***** END OF PAPER, THANKS *****

By: 239 (26 , 34)

THIS IS THE ANSWER AND SOLUTION FOR PAPER NUMBER 29

THIS IS AN EXAMPLE OF PERSONALIZED TESTS.

If needed, please use the following constants.

Constant	Symbol	Value
Acceleration due to earth's gravity	g	9.80 m/s^2
Avogadro's number	N_A	6.0221367×10^{23} mol^{-1}
Boltzmann's constant	k	1.380658×10^{-23} J/K
Coulomb's constant	k	8.99×10^{9} N·m^2/C^2
Electron charge magnitiude	e	$1.60217733 \times 10^{-19}$ C
Permeability of free space	μ_0	$1.25663706 \times 10^{-6}$ T·m/A
Permittivity of free space	ϵ_0	$8.854187817 \times 10^{-12}$ C^2/(N·m^2)
Pi	π	3.14159265
Planck's constant	h	$6.6260755 \times 10^{-34}$ J·s
Mass of electron	m_e	$9.1093897 \times 10^{-31}$ kg

Constant	Symbol	Value
Mass of neutron	m_n	$1.6749286 \times 10^{-27}$ kg
Mass of proton	m_p	$1.6726231 \times 10^{-27}$ kg
Speed of light in vacuum	c	299792458. m/s
Universal gravitational constant	G	6.67259×10^{-11} N·m^2/kg^2
Universal gas constant	R	8.314510 J/(mol·K)

Please be advised that in this paper there are questions from 29.1 through 29.9. And any one of them may contain more than one sub-question, thus the total number of sub-questions here is around 14, of which 13 should be answered.

In this paper, big questions will be generated in the following order:
1 (6) , 2 (1) , 3 (2) , 4 (4) , 5 (3) , 6 (5) , 7 (8) , 8 (7) , 9 (9) .

QUESTION 29.1 (6)

Please answer ONLY 5 of the following 6

questions (Questions 29.1.1 through 29.1.6).

Here are still some constants for use in the following questions:

Constant	Symbol	Value
Boltzmann's constant	k	1.381×10^{-23} J/K
Avogadro's number	N_A	6.022×10^{23} mol^{-1}
Mass of electron	m_e	$9.1093897 \times 10^{-31}$ kg

In this big question of CHOOSE structure, 6 questions will be generated: 1 (7 , 22) , 2 (13 , 28) , 3 (12 , 27) , 4 (6 , 21) , 5 (8 , 23) , 6 (11 , 26) .

Question 29.1.1 (6 , 7 , 22)

Auto-answer:

F. The accelaration (vector) is $(12462., 1744.6, -1.2462 \times 10^6) km/h^2$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (50.0, 7.0, -5000.0)N$ and $m = 52.0kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(50.0, 7.0, -5000.0)N}{52.0kg} \\
&= (0.96154, 0.13462, -96.154)ms^{-2} \\
&= (12462., 1744.6, -1.2462 \times 10^6)km/h^2.
\end{aligned}$$

Question 29.1.2 (6 , 13 , 28)

Answer:

5;
6;
The operation is MULTIPLICATION and the result is 30.000.

Question 29.1.3 (6 , 12 , 27)
Solution:

Since the possiblity of smoking customer is $a = 0.230$, and the possiblity of equal-or-above 30 years old customer is $b = 0.5600$, the possiblity of non-smoking customer is $c = 1.0 - a = 1.0 - 0.230 = 0.770$ and the possiblity of under 30 years old customer is $d = 1.0 - b = 1.0 - 0.5600 = 0.4400$. Then

Customer	Possibility
smoking and equal-or-above 30 years old	$0.230 \times 0.5600 = 0.129$
smoking and under 30 years old	$0.230 \times 0.4400 = 0.101$
non-smoking and equal-or-above 30 years old	$0.770 \times 0.5600 = 0.431$
non-smoking and under 30 years old	$0.770 \times 0.4400 = 0.339$

And the total summation of all possibilities is 1.000.

Answer:

Customer	Possibility
smoking and equal-or-above 30 years old	0.129
smoking and under 30 years old	0.101
non-smoking and equal-or-above 30 years old	0.431
non-smoking and under 30 years old	0.339

And the total summation of all possibilities is 1.000.

Question 29.1.4 (6 , 6 , 21)
Answer:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (60.0, 5.0, -4000.0)N$ and $m = 54.0kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(60.0, 5.0, -4000.0)N}{54.0kg} \\
&= (1.1111, 9.2593 \times 10^{-2}, -74.074)ms^{-2} \\
&= (14400., 1200.0, -960000.)km/h^2.
\end{aligned}$$

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (60.0, 5.0, -4000.0)N$ and $m = 54.0kg$, bring them into the above equation, then we get

$$\begin{aligned}\mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(60.0, 5.0, -4000.0)N}{54.0kg} \\ &= (1.1111, 9.2593 \times 10^{-2}, -74.074)ms^{-2} \\ &= (14400., 1200.0, -960000.)km/h^2.\end{aligned}$$

Question 29.1.5 (6 , 8 , 23)

Auto-answer:

D. The accelaration is $(1.1111ms^{-2}, 0.11111ms^{-2}, -720000.km/h^2)$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (60.0, 6.0, -3000.0)N$ and $m = 54.0kg$, bring them into the above equation, then we get

$$\begin{aligned}\mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(60.0, 6.0, -3000.0)N}{54.0kg} \\ &= (1.1111, 0.11111, -55.556)ms^{-2} \\ &= (14400., 1440.0, -720000.)km/h^2.\end{aligned}$$

Question 29.1.6 (6 , 11 , 26)

Solution:

Since the possiblity of smoking customer is $a = 0.770$, and the possiblity of under 30 years old customer is $b = 0.7000$, the possiblity of non-smoking customer is $c = 1.0 - a = 1.0 - 0.770 = 0.230$ and the possiblity of equal or above 30 years old customer is $d = 1.0 - b = 1.0 - 0.7000 = 0.3000$. So the possibility of non-smoking and equal or above 30 years old customer is $c \times d = 6.90 \times 10^{-2}$.

Answer:

The possibility of non-smoking and equal or above 30 years old customer is $(1 - a)(1 - b) = 6.90 \times 10^{-2}$.

You have done all the above? A very good beginning, please go ahead. More constants the Mass of electron m_e= 9.109390×10^{-31} kg , Universal gas constant R= 8.315 J/(mol·K) , e= $1.60217733 \times 10^{-19}$ C , and m_p= $1.6726231 \times 10^{-27}$ kg may be very helpful.

QUESTION 29.2 (1 , 1 , 1)

Auto-answer:

E. The accelaration is $(0.962, 7.7 \times 10^{-2}, -115.38)ms^{-2}$.

Answer:

The correct answer from the choices is
E. The accelaration is $(0.962, 7.7 \times 10^{-2}, -115.38)ms^{-2}$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (50.0, 4.0, -6000.0)N$ and $m = 52.0000kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(50.0, 4.0, -6000.0)N}{52.0000kg} \\
&= (0.962, 7.7 \times 10^{-2}, -115.38)ms^{-2}
\end{aligned}$$

QUESTION 29.3 (2 , 2 , 2)

Auto-answer:

A. The accelaration is $(0.92593ms^{-2}, 720.00km/h^2, -74.074ms^{-2})$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (50.000, 3.0000, -4000.0)N$ and $m = 54.0000kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(50.000, 3.0000, -4000.0)N}{54.0000kg} \\
&= (0.92593, 5.5556 \times 10^{-2}, -74.074)ms^{-2} \\
&= (12000., 720.00, -960000.)km/h^2.
\end{aligned}$$

QUESTION 29.4 (4 , 4 , 4)

Auto-answer:

Column Left	Column Right	Answers
A. B	ER	**E.**
B. yjh	a	**D.**
C. A= 4/ 2	b	**A.**
D. A	a= 2	**C.**
E. er	YJH	**B.**

QUESTION 29.5 (3 , 3 , 3)

Auto-answer:

A. Canada has 10 provinces and 3 territories.

QUESTION 29.6 (5 , 5 , 5)

Answer:

The correct answer	*T*	1. 69 is an odd number.
The correct answer	*F*	2. Montreal is in Ontario province.
The correct answer	*T*	3. $\mathbf{F} = m\mathbf{a}$ is a mathmatical form of the Newton's Second Law.

You have done all the above? Excellent! Not much left, please continue.

QUESTION 29.7 (8 , 15 , 60)

Answer:

$$\begin{pmatrix} 4 & 5 & 6 & 6 \\ 6 & 7 & 4 & 4 \\ 6 & 5 & 4 & 6 \end{pmatrix} \times \begin{pmatrix} 2 \\ 2 \\ 2 \\ 2 \end{pmatrix} = \begin{pmatrix} 42 \\ 42 \\ 42 \end{pmatrix}$$

$$\begin{pmatrix} \delta & \beta \\ \Phi & \Gamma \\ \Delta & \Psi \\ \Psi & \Xi \end{pmatrix} \begin{pmatrix} \beta \\ \beta \end{pmatrix} = \begin{pmatrix} \delta \times \beta + \beta \times \beta \\ \Phi \times \beta + \Gamma \times \beta \\ \Delta \times \beta + \Psi \times \beta \\ \Psi \times \beta + \Xi \times \beta \end{pmatrix}$$

Solution:

QUESTION 29.8 (7 , 14 , 50)

Auto-answer:

D. The accelaration is $(0.862, 5.2 \times 10^{-2}, -51.724)ms^{-2}$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (50.0, 3.0, -3000.0)N$ and $m = 58.0kg$, bring them into the above equation, then we get

$$\begin{aligned}\mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(50.0, 3.0, -3000.0)N}{58.0kg} \\ &= (0.862, 5.2 \times 10^{-2}, -51.724)ms^{-2}\end{aligned}$$

QUESTION 29.9 (9 , 16 , 70)

Answer:

29, 32

Solution:

Roots to the equation

$$11 \times x^2 - 671 \times x + 10208 = 0$$

are 29 and 32 .

Let us verity 29 first: $11 \times x^2 - 671 \times x + 10208 = 9251 + (-19459) + (10208) = -10208 + (10208) = 0$

Then verity 32: $11 \times x^2 - 671 \times x + 10208 = 11264 + (-21472) + (10208) = -10208 + (10208) = 0$

Here are still some constants for use:

Constant	Symbol	Value
Mass of proton	m_p	$1.6726231 \times 10^{-27}$ kg
Boltzmann's constant	k	1.381×10^{-23} J/K

Thank you very much for answering these questions!

Please be advised that in this paper there are questions from 29.1 through 29.9. And any one of them may contain more than one sub-question, thus the total number of sub-questions here is around 14, of which 13 should be answered.

***** END OF PAPER, THANKS *****

By: 239 (26 , 34)

THIS IS THE ANSWER AND SOLUTION FOR PAPER NUMBER 30

THIS IS AN EXAMPLE OF PERSONALIZED TESTS.

If needed, please use the following constants.

Constant	Symbol	Value
Acceleration due to earth's gravity	g	9.80 m/s^2
Avogadro's number	N_A	6.0221367×10^{23} mol^{-1}
Boltzmann's constant	k	1.380658×10^{-23} J/K
Coulomb's constant	k	8.99×10^9 N·m^2/C^2
Electron charge magnitiude	e	$1.60217733 \times 10^{-19}$ C
Permeability of free space	μ_0	$1.25663706 \times 10^{-6}$ T·m/A
Permittivity of free space	ϵ_0	$8.854187817 \times 10^{-12}$ C^2/(N·m^2)
Pi	π	3.14159265
Planck's constant	h	$6.6260755 \times 10^{-34}$ J·s
Mass of electron	m_e	$9.1093897 \times 10^{-31}$ kg

Constant	Symbol	Value
Mass of neutron	m_n	$1.6749286 \times 10^{-27}$ kg
Mass of proton	m_p	$1.6726231 \times 10^{-27}$ kg
Speed of light in vacuum	c	299792458. m/s
Universal gravitational constant	G	6.67259×10^{-11} N·m^2/kg^2
Universal gas constant	R	8.314510 J/(mol·K)

Please be advised that in this paper there are questions from 30.1 through 30.9. And any one of them may contain more than one sub-question, thus the total number of sub-questions here is around 14, of which 13 should be answered.

In this paper, big questions will be generated in the following order:
1 (6) , 2 (5) , 3 (3) , 4 (1) , 5 (4) , 6 (2) , 7 (7) , 8 (8) , 9 (9) .

QUESTION 30.1 (6)

Please answer ONLY 5 of the following 6

questions (Questions 30.1.1 through 30.1.6).

Here are still some constants for use in the following questions:

Constant	Symbol	Value
Boltzmann's constant	k	1.381×10^{-23} J/K
Avogadro's number	N_A	6.022×10^{23} mol^{-1}
Mass of electron	m_e	$9.1093897 \times 10^{-31}$ kg

In this big question of CHOOSE structure, 6 questions will be generated: 1 (10 , 25) , 2 (12 , 27) , 3 (6 , 21) , 4 (9 , 24) , 5 (8 , 23) , 6 (7 , 22) .

Question 30.1.1 (6 , 10 , 25)

Auto-answer:

A. An airplane
E. A truck

Question 30.1.2 (6 , 12 , 27)

Solution:

Since the possiblity of smoking customer is $a = 0.730$, and the possiblity of equal-or-above 30 years old customer is $b = 0.7600$, the possiblity of non-smoking customer is $c = 1.0 - a = 1.0 - 0.730 = 0.270$ and the possiblity of under 30 years old customer is $d = 1.0 - b = 1.0 - 0.7600 = 0.2400$. Then

Customer	Possibility
smoking and equal-or-above 30 years old	$0.730 \times 0.7600 = 0.555$
smoking and under 30 years old	$0.730 \times 0.2400 = 0.175$
non-smoking and equal-or-above 30 years old	$0.270 \times 0.7600 = 0.205$
non-smoking and under 30 years old	$0.270 \times 0.2400 = 6.48 \times 10^{-2}$

And the total summation of all possibilities is 1.000.

Answer:

Customer	Possibility
smoking and equal-or-above 30 years old	0.555
smoking and under 30 years old	0.175
non-smoking and equal-or-above 30 years old	0.205
non-smoking and under 30 years old	6.48×10^{-2}

And the total summation of all possibilities is 1.000.

Question 30.1.3 (6 , 6 , 21)

Answer:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (80.0, 2.0, -7000.0)N$ and $m = 58.0kg$, bring them into the above equation, then we get

$$\begin{aligned} \mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(80.0, 2.0, -7000.0)N}{58.0kg} \\ &= (1.3793, 3.4483 \times 10^{-2}, -120.69)ms^{-2} \\ &= (17876., 446.90, -1.5641 \times 10^{6})km/h^{2}. \end{aligned}$$

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (80.0, 2.0, -7000.0)N$ and $m = 58.0kg$, bring them into the above equation, then we get

$$\begin{aligned} \mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(80.0, 2.0, -7000.0)N}{58.0kg} \\ &= (1.3793, 3.4483 \times 10^{-2}, -120.69)ms^{-2} \\ &= (17876., 446.90, -1.5641 \times 10^{6})km/h^{2}. \end{aligned}$$

Question 30.1.4 (6 , 9 , 24)

Solution:

By using Newton's Law of Universal Gravitation:

$$F = G\frac{(Sun's\ \ mass) \times (Planet's\ \ mass)}{(distance)^2},$$

where $G = 6.67 \times 10^{-11} Nm^2(kg)^{-2}$, the forces can be easily calculated as

The Planet	Mass (kg)	Distanace from Sun (m)	The Force (N)
Mercury	$3.00000000 \times 10^{24}$	$7.000000000 \times 10^{24}$	1.23×10^{-11}
Venus	3.00×10^{24}	5.00×10^{24}	2.40×10^{-11}
Earth	9.00×10^{24}	8.00×10^{24}	2.81×10^{-11}
Mars	9.00×10^{24}	3.00×10^{24}	2.00×10^{-10}
Jupiter	7.00×10^{24}	5.00×10^{24}	5.60×10^{-11}
Saturn	1.000×10^{25}	8.00×10^{24}	3.13×10^{-11}
Uranus	6.00×10^{24}	9.00×10^{24}	1.48×10^{-11}
Neptune	6.00×10^{24}	7.00×10^{24}	2.45×10^{-11}

Answer:

By using Newton's Law of Universal Gravitation:

$$F = G\frac{(Sun's\ \ mass) \times (Planet's\ \ mass)}{(distance)^2},$$

where $G = 6.67 \times 10^{-11} Nm^2(kg)^{-2}$, the forces can be easily calculated as

The Planet	Mass (kg)	Distanace from Sun (m)	The Force (N)
Mercury	$3.00000000 \times 10^{24}$	$7.000000000 \times 10^{24}$	1.23×10^{-11}
Venus	3.00×10^{24}	5.00×10^{24}	2.40×10^{-11}
Earth	9.00×10^{24}	8.00×10^{24}	2.81×10^{-11}
Mars	9.00×10^{24}	3.00×10^{24}	2.00×10^{-10}
Jupiter	7.00×10^{24}	5.00×10^{24}	$5.60 \times 10^{-11}3$
Saturn	1.000×10^{25}	8.00×10^{24}	3.13×10^{-11}
Uranus	6.00×10^{24}	9.00×10^{24}	1.48×10^{-11}
Neptune	6.00×10^{24}	7.00×10^{24}	2.45×10^{-11}

Question 30.1.5 (6 , 8 , 23)

Auto-answer:

C. The accelaration is $(1.0714ms^{-2}, 0.10714ms^{-2}, -694286.km/h^2)$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (60.0, 6.0, -3000.0)N$ and $m = 56.0kg$, bring them into the above equation, then we get

$$\begin{aligned} \mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(60.0, 6.0, -3000.0)N}{56.0kg} \\ &= (1.0714, 0.10714, -53.571)ms^{-2} \\ &= (13886., 1388.6, -694286.)km/h^2. \end{aligned}$$

Question 30.1.6 (6 , 7 , 22)

Auto-answer:

B. The accelaration (vector) is $(7200.0, 480.00, -1.4400 \times 10^6)km/h^2$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (30.0, 2.0, -6000.0)N$ and $m = 54.0kg$, bring them into the above equation, then we get

$$\begin{aligned} \mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(30.0, 2.0, -6000.0)N}{54.0kg} \\ &= (0.55556, 3.7037 \times 10^{-2}, -111.11)ms^{-2} \\ &= (7200.0, 480.00, -1.4400 \times 10^6)km/h^2. \end{aligned}$$

You have done all the above? A very good beginning, please go ahead. More constants the Mass of electron m_e= 9.109390×10^{-31} kg , Universal gas constant R= 8.315 J/(mol·K) , e= $1.60217733 \times 10^{-19}$ C , and m_p= $1.6726231 \times 10^{-27}$ kg may be very helpful.

QUESTION 30.2 (5 , 5 , 5)

Answer:

The correct answer	T	1. 28 is an even number.
The correct answer	F	2. Montreal is in Ontario province.
The correct answer	T	3. $\mathbf{F} = m\mathbf{a}$ is a mathmatical form of the Newton's Second Law.

QUESTION 30.3 (3 , 3 , 3)

Auto-answer:

F. None of above.

QUESTION 30.4 (1 , 1 , 1)

Auto-answer:

B. The accelaration is $(0.385, 7.7 \times 10^{-2}, -115.38)ms^{-2}$.

Answer:

The correct answer from the choices is

B. The accelaration is $(0.385, 7.7 \times 10^{-2}, -115.38)ms^{-2}$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (20.0, 4.0, -6000.0)N$ and $m = 52.0000kg$, bring them into the above equation, then we get

$$\begin{aligned} \mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(20.0, 4.0, -6000.0)N}{52.0000kg} \\ &= (0.385, 7.7 \times 10^{-2}, -115.38)ms^{-2} \end{aligned}$$

QUESTION 30.5 (4 , 4 , 4)

Auto-answer:

Column Left	Column Right	Answers
A. A	b	**D.**
B. A= 6/ 2	ER	**C.** , **E.**
C. Er	eR	**C.** , **E.**
D. B	a= 3	**B.**
E. er	a	**A.**

QUESTION 30.6 (2 , 2 , 2)

Auto-answer:

B. The accelaration is $(0.33333ms^{-2}, 648.00km/h^2, -33.333ms^{-2})$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (20.000, 3.0000, -2000.0)N$ and $m = 60.0000kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(20.000, 3.0000, -2000.0)N}{60.0000kg} \\
&= (0.33333, 5.0000 \times 10^{-2}, -33.333)ms^{-2} \\
&= (4320.0, 648.00, -432000.)km/h^2.
\end{aligned}$$

You have done all the above? Excellent! Not much left, please continue.

QUESTION 30.7 (7 , 14 , 50)

Auto-answer:

A. The accelaration is $(1.11, 5.6 \times 10^{-2}, -111.11)ms^{-2}$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (60.0, 3.0, -6000.0)N$ and $m = 54.0kg$, bring them into the above equation, then we get

$$\begin{aligned}\mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(60.0, 3.0, -6000.0)N}{54.0kg} \\ &= (1.11, 5.6\times 10^{-2}, -111.11)ms^{-2}\end{aligned}$$

QUESTION 30.8 (8 , 15 , 60)

Answer:

$$\begin{pmatrix} 4 & 6 & 7 & 5 \\ 5 & 4 & 5 & 6 \\ 5 & 4 & 5 & 6 \end{pmatrix} \times \begin{pmatrix} 2 \\ 2 \\ 2 \\ 2 \end{pmatrix} = \begin{pmatrix} 44 \\ 40 \\ 40 \end{pmatrix}$$

$$\begin{pmatrix} \Lambda & \Psi \\ \sigma & \Upsilon \\ \beta & \beta \\ \Phi & \Theta \end{pmatrix} \begin{pmatrix} \beta \\ \beta \end{pmatrix} = \begin{pmatrix} \Lambda\times\beta + \Psi\times\beta \\ \sigma\times\beta + \Upsilon\times\beta \\ \beta\times\beta + \beta\times\beta \\ \Phi\times\beta + \Theta\times\beta \end{pmatrix}$$

Solution:

QUESTION 30.9 (9 , 16 , 70)

Answer:

17, -10

Solution:

Roots to the equation

$$-9\times x^2 + 63\times x + 1530 = 0$$

are 17 and -10 .

Let us verity 17 first: $-9 \times x^2 + 63 \times x + 1530 = -2601 + (1071) + (1530) = -1530 + (1530) = 0$

Then verity -10: $-9 \times x^2 + 63 \times x + 1530 = -900 + (-630) + (1530) = -1530 + (1530) = 0$

Here are still some constants for use:

Constant	Symbol	Value
Mass of proton	m_p	$1.6726231 \times 10^{-27}$ kg
Boltzmann's constant	k	1.381×10^{-23} J/K

Thank you very much for answering these questions!

Please be advised that in this paper there are questions from 30.1 through 30.9. And any one of them may contain more than one sub-question, thus the total number of sub-questions here is around 14, of which 13 should be answered.

***** END OF PAPER, THANKS *****

By: 239 (26 , 34)

THIS IS THE ANSWER AND SOLUTION FOR PAPER NUMBER 31

THIS IS AN EXAMPLE OF PERSONALIZED TESTS.

If needed, please use the following constants.

Constant	Symbol	Value
Acceleration due to earth's gravity	g	9.80 m/s^2
Avogadro's number	N_A	6.0221367×10^{23} mol^{-1}
Boltzmann's constant	k	1.380658×10^{-23} J/K
Coulomb's constant	k	8.99×10^9 N·m^2/C^2
Electron charge magnitiude	e	$1.60217733 \times 10^{-19}$ C
Permeability of free space	μ_0	$1.25663706 \times 10^{-6}$ T·m/A
Permittivity of free space	ϵ_0	$8.854187817 \times 10^{-12}$ C^2/(N·m^2)
Pi	π	3.14159265
Planck's constant	h	$6.6260755 \times 10^{-34}$ J·s
Mass of electron	m_e	$9.1093897 \times 10^{-31}$ kg

Constant	Symbol	Value
Mass of neutron	m_n	$1.6749286 \times 10^{-27}$ kg
Mass of proton	m_p	$1.6726231 \times 10^{-27}$ kg
Speed of light in vacuum	c	299792458. m/s
Universal gravitational constant	G	6.67259×10^{-11} N·m^2/kg^2
Universal gas constant	R	8.314510 J/(mol·K)

Please be advised that in this paper there are questions from 31.1 through 31.9. And any one of them may contain more than one sub-question, thus the total number of sub-questions here is around 14, of which 13 should be answered.

In this paper, big questions will be generated in the following order:
1 (6) , 2 (3) , 3 (2) , 4 (4) , 5 (5) , 6 (1) , 7 (8) , 8 (7) , 9 (9) .

QUESTION 31.1 (6)
Please answer ONLY 5 of the following 6

questions (Questions 31.1.1 through 31.1.6).

Here are still some constants for use in the following questions:

Constant	Symbol	Value
Boltzmann's constant	k	1.381×10^{-23} J/K
Avogadro's number	N_A	6.022×10^{23} mol^{-1}
Mass of electron	m_e	$9.1093897 \times 10^{-31}$ kg

In this big question of CHOOSE structure, 6 questions will be generated: 1 (11 , 26) , 2 (7 , 22) , 3 (12 , 27) , 4 (8 , 23) , 5 (10 , 25) , 6 (6 , 21) .

Question 31.1.1 (6 , 11 , 26)

Solution:

Since the possiblity of smoking customer is $a = 0.240$, and the possiblity of equal or above 30 years old customer is $b = 2.00 \times 10^{-2}$, the possiblity of non-smoking customer is $c = 1.0 - a = 1.0 - 0.240 = 0.760$ and the possiblity of under 30 years old customer is $d = 1.0 - b = 1.0 - 2.00 \times 10^{-2} = 0.9800$. So the possibility of non-smoking and under 30 years old customer is $c \times d = 0.745$.

Answer:

The possibility of non-smoking and under 30 years old customer is $(1 - a)(1 - b) = 0.745$.

Question 31.1.2 (6 , 7 , 22)

Auto-answer:

J. The accelaration (vector) is $(4800.0, 480.00, -960000.)km/h^2$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (20.0, 2.0, -4000.0)N$ and $m = 54.0kg$, bring them into the above equation, then we get

$$\begin{aligned} \mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(20.0, 2.0, -4000.0)N}{54.0kg} \\ &= (0.37037, 3.7037 \times 10^{-2}, -74.074)ms^{-2} \\ &= (4800.0, 480.00, -960000.)km/h^2. \end{aligned}$$

Question 31.1.3 (6 , 12 , 27)

Solution:

Since the possiblity of non-smoking customer is $a = 0.910$, and the possiblity of equal-or-above 30 years old customer is $b = 0.5000$, the possiblity of smoking customer is $c = 1.0-a = 1.0-0.910 = 9.00\times10^{-2}$ and the possiblity of under 30 years old customer is $d = 1.0 - b = 1.0 - 0.5000 = 0.5000$. Then

Customer	Possibility
smoking and equal-or-above 30 years old	$9.00 \times 10^{-2} \times 0.5000 = 4.50 \times 10^{-2}$
smoking and under 30 years old	$9.00 \times 10^{-2} \times 0.5000 = 4.50 \times 10^{-2}$
non-smoking and equal-or-above 30 years old	$0.910 \times 0.5000 = 0.455$
non-smoking and under 30 years old	$0.910 \times 0.5000 = 0.455$

And the total summation of all possibilities is 1.000.

Answer:

Customer	Possibility
smoking and equal-or-above 30 years old	4.50×10^{-2}
smoking and under 30 years old	4.50×10^{-2}
non-smoking and equal-or-above 30 years old	0.455
non-smoking and under 30 years old	0.455

And the total summation of all possibilities is 1.000.

Question 31.1.4 (6 , 8 , 23)

Auto-answer:

E. none of these.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (30.0, 2.0, -2000.0)N$ and $m = 52.0kg$, bring them into the above equation, then we get

$$\begin{aligned}\mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(30.0, 2.0, -2000.0)N}{52.0kg} \\ &= (0.57692, 3.8462 \times 10^{-2}, -38.462)ms^{-2} \\ &= (7476.9, 498.46, -498462.)km/h^2.\end{aligned}$$

Question 31.1.5 (6 , 10 , 25)

Auto-answer:

A. An airplane

Question 31.1.6 (6 , 6 , 21)

Answer:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (60.0, 5.0, -6000.0)N$ and $m = 56.0kg$, bring them into the above equation, then we get

$$\begin{aligned}\mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(60.0, 5.0, -6000.0)N}{56.0kg} \\ &= (1.0714, 8.9286 \times 10^{-2}, -107.14)ms^{-2} \\ &= (13886., 1157.1, -1.3886 \times 10^{6})km/h^2.\end{aligned}$$

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (60.0, 5.0, -6000.0)N$ and $m = 56.0kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(60.0, 5.0, -6000.0)N}{56.0kg} \\
&= (1.0714, 8.9286 \times 10^{-2}, -107.14)ms^{-2} \\
&= (13886., 1157.1, -1.3886 \times 10^{6})km/h^{2}.
\end{aligned}$$

You have done all the above? A very good beginning, please go ahead.

More constants the Mass of electron m_e= 9.109390×10^{-31} kg , Universal gas constant R= 8.315 J/(mol·K) , e= $1.60217733 \times 10^{-19}$ C , and m_p= $1.6726231 \times 10^{-27}$ kg may be very helpful.

QUESTION 31.2 (3 , 3 , 3)

Auto-answer:

F. None of above.

QUESTION 31.3 (2 , 2 , 2)

Auto-answer:

C. The accelaration is $(1.5385ms^{-2}, 2243.1km/h^{2}, -96.154ms^{-2})$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (80.000, 9.0000, -5000.0)N$ and $m = 52.0000kg$, bring them into the above equation, then we get

$$\begin{aligned}\mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(80.000, 9.0000, -5000.0)N}{52.0000kg} \\ &= (1.5385, 0.17308, -96.154)ms^{-2} \\ &= (19938., 2243.1, -1.2462 \times 10^{6})km/h^{2}.\end{aligned}$$

QUESTION 31.4 (4 , 4 , 4)

Auto-answer:

Column Left	Column Right	Answers
A. B	YJH	**E.**
B. asdf(:)	a= 4	**C.**
C. A= 8/ 2	c	**D.**
D. C	b	**A.**
E. yjh	ASDF(:)	**B.**

QUESTION 31.5 (5 , 5 , 5)

Answer:

The correct answer	T	1. 50 is an even number.
The correct answer	F	2. Montreal is in Ontario province.
The correct answer	T	3. $\mathbf{F} = m\mathbf{a}$ is a mathmatical form of the Newton's Second Law.

QUESTION 31.6 (1 , 1 , 1)

Auto-answer:

B. The accelaration is $(0.769, 5.8 \times 10^{-2}, -115.38)ms^{-2}$.

Answer:

The correct answer from the choices is

B. The accelaration is $(0.769, 5.8 \times 10^{-2}, -115.38)ms^{-2}$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (40.0, 3.0, -6000.0)N$ and $m = 52.0000kg$, bring them into the above equation, then we get

$$\begin{aligned} \mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(40.0, 3.0, -6000.0)N}{52.0000kg} \\ &= (0.769, 5.8 \times 10^{-2}, -115.38)ms^{-2} \end{aligned}$$

You have done all the above? Excellent! Not much left, please continue.

QUESTION 31.7 (8 , 15 , 60)

Answer:

$$\begin{pmatrix} 5 & 6 & 6 & 6 \\ 6 & 4 & 4 & 4 \\ 5 & 6 & 5 & 5 \end{pmatrix} \times \begin{pmatrix} 2 \\ 2 \\ 2 \\ 2 \end{pmatrix} = \begin{pmatrix} 46 \\ 36 \\ 42 \end{pmatrix}$$

$$\begin{pmatrix} \Theta & \delta \\ \Xi & \varepsilon \\ \delta & \beta \\ \Phi & \Xi \end{pmatrix} \begin{pmatrix} \gamma \\ \beta \end{pmatrix} = \begin{pmatrix} \Theta \times \gamma + \delta \times \beta \\ \Xi \times \gamma + \varepsilon \times \beta \\ \delta \times \gamma + \beta \times \beta \\ \Phi \times \gamma + \Xi \times \beta \end{pmatrix}$$

Solution:

QUESTION 31.8 (7 , 14 , 50)

Auto-answer:

C. The accelaration is $(1.73, 9.6 \times 10^{-2}, -57.692)ms^{-2}$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (90.0, 5.0, -3000.0)N$ and $m = 52.0kg$, bring them into the above equation, then we get

$$\begin{aligned} \mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(90.0, 5.0, -3000.0)N}{52.0kg} \\ &= (1.73, 9.6 \times 10^{-2}, -57.692)ms^{-2} \end{aligned}$$

QUESTION 31.9 (9 , 16 , 70)

Answer:

13, 41

Solution:

Roots to the equation

$$3 \times x^2 - 162 \times x + 1599 = 0$$

are 13 and 41 .

Let us verity 13 first: $3 \times x^2 - 162 \times x + 1599 = 507 + (-2106) + (1599) = -1599 + (1599) = 0$

Then verity 41: $3 \times x^2 - 162 \times x + 1599 = 5043 + (-6642) + (1599) = -1599 + (1599) = 0$

Here are still some constants for use:

Constant	Symbol	Value
Mass of proton	m_p	$1.6726231 \times 10^{-27}$ kg
Boltzmann's constant	k	1.381×10^{-23} J/K

Thank you very much for answering these questions!

Please be advised that in this paper there are questions from 31.1 through 31.9. And any one of them may contain more than one sub-question, thus the total number of sub-questions here is around 14, of which 13 should be answered.

***** END OF PAPER, THANKS *****

By: 239 (26 , 34)

THIS IS THE ANSWER AND SOLUTION FOR PAPER NUMBER 32

THIS IS AN EXAMPLE OF PERSONALIZED TESTS.

If needed, please use the following constants.

Constant	Symbol	Value
Acceleration due to earth's gravity	g	$9.80\ \mathrm{m/s^2}$
Avogadro's number	N_A	$6.0221367 \times 10^{23}\ \mathrm{mol^{-1}}$
Boltzmann's constant	k	$1.380658 \times 10^{-23}\ \mathrm{J/K}$
Coulomb's constant	k	$8.99 \times 10^{9}\ \mathrm{N{\cdot}m^2/C^2}$
Electron charge magnitiude	e	$1.60217733 \times 10^{-19}\ \mathrm{C}$
Permeability of free space	μ_0	$1.25663706 \times 10^{-6}\ \mathrm{T{\cdot}m/A}$
Permittivity of free space	ϵ_0	$8.854187817 \times 10^{-12}\ \mathrm{C^2/(N{\cdot}m^2)}$
Pi	π	3.14159265
Planck's constant	h	$6.6260755 \times 10^{-34}\ \mathrm{J{\cdot}s}$
Mass of electron	m_e	$9.1093897 \times 10^{-31}\ \mathrm{kg}$
Constant	Symbol	Value
Mass of neutron	m_n	$1.6749286 \times 10^{-27}\ \mathrm{kg}$
Mass of proton	m_p	$1.6726231 \times 10^{-27}\ \mathrm{kg}$
Speed of light in vacuum	c	299792458. m/s
Universal gravitational constant	G	$6.67259 \times 10^{-11}\ \mathrm{N{\cdot}m^2/kg^2}$
Universal gas constant	R	$8.314510\ \mathrm{J/(mol{\cdot}K)}$

Please be advised that in this paper there are questions from 32.1 through 32.9. And any one of them may contain more than one sub-question, thus the total number of sub-questions here is around 14, of which 13 should be answered.

In this paper, big questions will be generated in the following order:
1 (6) , 2 (5) , 3 (3) , 4 (2) , 5 (4) , 6 (1) , 7 (8) , 8 (7) , 9 (9) .

QUESTION 32.1 (6)
Please answer ONLY 5 of the following 6

questions (Questions 32.1.1 through 32.1.6).

Here are still some constants for use in the following questions:

Constant	Symbol	Value
Boltzmann's constant	k	1.381×10^{-23} J/K
Avogadro's number	N_A	6.022×10^{23} mol^{-1}
Mass of electron	m_e	$9.1093897 \times 10^{-31}$ kg

In this big question of CHOOSE structure, 6 questions will be generated: 1 (8 , 23) , 2 (9 , 24) , 3 (12 , 27) , 4 (7 , 22) , 5 (6 , 21) , 6 (11 , 26) .

Question 32.1.1 (6 , 8 , 23)

Auto-answer:

A. The accelaration is $(0.34483ms^{-2}, 0.15517ms^{-2}, -893793.km/h^2)$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (20.0, 9.0, -4000.0)N$ and $m = 58.0kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(20.0, 9.0, -4000.0)N}{58.0kg} \\
&= (0.34483, 0.15517, -68.966)ms^{-2} \\
&= (4469.0, 2011.0, -893793.)km/h^2.
\end{aligned}$$

Question 32.1.2 (6 , 9 , 24)

Solution:

By using Newton's Law of Universal Gravitation:

$$F = G\frac{(Sun's\ \ mass) \times (Planet's\ \ mass)}{(distance)^2},$$

where $G = 6.67 \times 10^{-11} Nm^2(kg)^{-2}$, the forces can be easily calculated as

The Planet	Mass (kg)	Distanace from Sun (m)	The Force (N)
Mercury	$8.00000000 \times 10^{24}$	$3.000000000 \times 10^{24}$	4.15×10^{-10}
Venus	4.00×10^{24}	1.000×10^{25}	1.87×10^{-11}
Earth	3.00×10^{24}	5.00×10^{24}	5.60×10^{-11}
Mars	3.00×10^{24}	1.000×10^{25}	1.40×10^{-11}
Jupiter	1.000×10^{25}	4.00×10^{24}	2.92×10^{-10}
Saturn	4.00×10^{24}	8.00×10^{24}	2.92×10^{-11}
Uranus	4.00×10^{24}	2.00×10^{24}	4.67×10^{-10}
Neptune	3.00×10^{24}	5.00×10^{24}	5.60×10^{-11}

Answer:

By using Newton's Law of Universal Gravitation:

$$F = G\frac{(Sun's\ \ mass) \times (Planet's\ \ mass)}{(distance)^2},$$

where $G = 6.67 \times 10^{-11} Nm^2(kg)^{-2}$, the forces can be easily calculated as

The Planet	Mass (kg)	Distanace from Sun (m)	The Force (N)
Mercury	$8.00000000 \times 10^{24}$	$3.000000000 \times 10^{24}$	4.15×10^{-10}
Venus	4.00×10^{24}	1.000×10^{25}	1.87×10^{-11}
Earth	3.00×10^{24}	5.00×10^{24}	5.60×10^{-11}
Mars	3.00×10^{24}	1.000×10^{25}	1.40×10^{-11}
Jupiter	1.000×10^{25}	4.00×10^{24}	$2.92 \times 10^{-10}3$
Saturn	4.00×10^{24}	8.00×10^{24}	2.92×10^{-11}
Uranus	4.00×10^{24}	2.00×10^{24}	4.67×10^{-10}
Neptune	3.00×10^{24}	5.00×10^{24}	5.60×10^{-11}

Question 32.1.3 (6 , 12 , 27)

Solution:

Since the possiblity of non-smoking customer is $a = 0.580$, and the possiblity of equal-or-above 30 years old customer is $b = 0.3200$, the possiblity of smoking customer is $c = 1.0 - a = 1.0 - 0.580 = 0.420$ and the possiblity of under 30 years old customer is $d = 1.0 - b = 1.0 - 0.3200 = 0.6800$. Then

Customer	Possibility
smoking and equal-or-above 30 years old	$0.420 \times 0.3200 = 0.134$
smoking and under 30 years old	$0.420 \times 0.6800 = 0.286$
non-smoking and equal-or-above 30 years old	$0.580 \times 0.3200 = 0.186$
non-smoking and under 30 years old	$0.580 \times 0.6800 = 0.394$

And the total summation of all possibilities is 1.000.

Answer:

Customer	Possibility
smoking and equal-or-above 30 years old	0.134
smoking and under 30 years old	0.286
non-smoking and equal-or-above 30 years old	0.186
non-smoking and under 30 years old	0.394

And the total summation of all possibilities is 1.000.

Question 32.1.4 (6 , 7 , 22)

Auto-answer:

F. The accelaration (vector) is $(17280., 1512.0, -864000.)km/h^2$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (80.0, 7.0, -4000.0)N$ and $m = 60.0kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(80.0, 7.0, -4000.0)N}{60.0kg} \\
&= (1.3333, 0.11667, -66.667)ms^{-2} \\
&= (17280., 1512.0, -864000.)km/h^2.
\end{aligned}$$

Question 32.1.5 (6 , 6 , 21)

Answer:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (70.0, 4.0, -3000.0)N$ and $m = 56.0kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(70.0, 4.0, -3000.0)N}{56.0kg} \\
&= (1.2500, 7.1429 \times 10^{-2}, -53.571)ms^{-2} \\
&= (16200., 925.71, -694286.)km/h^2.
\end{aligned}$$

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (70.0, 4.0, -3000.0)N$ and $m = 56.0kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(70.0, 4.0, -3000.0)N}{56.0kg} \\
&= (1.2500, 7.1429 \times 10^{-2}, -53.571)ms^{-2} \\
&= (16200., 925.71, -694286.)km/h^2.
\end{aligned}$$

Question 32.1.6 (6 , 11 , 26)

Solution:

Since the possiblity of smoking customer is $a = 0.400$, and the possiblity of equal or above 30 years old customer is $b = 0.5400$, the possiblity of non-smoking customer is $c = 1.0 - a = 1.0 - 0.400 = 0.600$ and the possiblity of under 30 years old customer is $d = 1.0 - b = 1.0 - 0.5400 = 0.4600$. So the possibility of non-smoking and under 30 years old customer is $c \times d = 0.276$.

Answer:

The possibility of non-smoking and under 30 years old customer is $(1-a)(1-b) = 0.276$.

You have done all the above? A very good beginning, please go ahead.

More constants the Mass of electron m_e= 9.109390×10^{-31} kg , Universal gas constant R= 8.315 J/(mol·K) , e= $1.60217733 \times 10^{-19}$ C , and m_p= $1.6726231 \times 10^{-27}$ kg may be very helpful.

QUESTION 32.2 (5 , 5 , 5)

Answer:

The correct answer	F	1. 79 is an even number.
The correct answer	F	2. Montreal is in Ontario province.
The correct answer	T	3. $\mathbf{F} = m\mathbf{a}$ is a mathmatical form of the Newton's Second Law.

QUESTION 32.3 (3 , 3 , 3)

Auto-answer:

A. Canada has 10 provinces and 3 territories.

QUESTION 32.4 (2 , 2 , 2)

Auto-answer:

C. The accelaration is $(1.2963ms^{-2}, 960.00km/h^2, -55.556ms^{-2})$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (70.000, 4.0000, -3000.0)N$ and $m = 54.0000kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(70.000, 4.0000, -3000.0)N}{54.0000kg} \\
&= (1.2963, 7.4074 \times 10^{-2}, -55.556)ms^{-2} \\
&= (16800., 960.00, -720000.)km/h^2.
\end{aligned}$$

QUESTION 32.5 (4 , 4 , 4)

Auto-answer:

Column Left	Column Right	Answers
A. yjh	b	**D.**
B. er	YJH	**A.**
C. A= 2/ 2	ER	**B.**
D. B	a= 1	**C.**
E. asdf(:)	ASDF(:)	**E.**

QUESTION 32.6 (1 , 1 , 1)

Auto-answer:

B. The accelaration is $(1.67, 0.10, -116.67)ms^{-2}$.

Answer:

The correct answer from the choices is

B. The accelaration is $(1.67, 0.10, -116.67)ms^{-2}$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (100.0, 6.0, -7000.0)N$ and $m = 60.0000kg$, bring them into the above equation, then we get

$$\begin{aligned} \mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(100.0, 6.0, -7000.0)N}{60.0000kg} \\ &= (1.67, 0.10, -116.67)ms^{-2} \end{aligned}$$

You have done all the above? Excellent! Not much left, please continue.

QUESTION 32.7 (8 , 15 , 60)

Answer:

$$\begin{pmatrix} 5 & 4 & 6 & 4 \\ 6 & 6 & 6 & 4 \\ 5 & 4 & 4 & 6 \end{pmatrix} \times \begin{pmatrix} 2 \\ 2 \\ 2 \\ 2 \end{pmatrix} = \begin{pmatrix} 38 \\ 44 \\ 38 \end{pmatrix}$$

$$\begin{pmatrix} \alpha & \Delta \\ \sigma & \Gamma \\ \Lambda & \delta \\ \Xi & \varepsilon \end{pmatrix} \begin{pmatrix} \beta \\ \beta \end{pmatrix} = \begin{pmatrix} \alpha \times \beta + \Delta \times \beta \\ \sigma \times \beta + \Gamma \times \beta \\ \Lambda \times \beta + \delta \times \beta \\ \Xi \times \beta + \varepsilon \times \beta \end{pmatrix}$$

Solution:

QUESTION 32.8 (7 , 14 , 50)

Auto-answer:

A. The accelaration is $(0.667, 0.13, -83.333)ms^{-2}$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (40.0, 8.0, -5000.0)N$ and $m = 60.0kg$, bring them into the above equation, then we get

$$\begin{aligned}\mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(40.0, 8.0, -5000.0)N}{60.0kg} \\ &= (0.667, 0.13, -83.333)ms^{-2}\end{aligned}$$

QUESTION 32.9 (9 , 16 , 70)

Answer:

13, 41

Solution:

Roots to the equation

$$9 \times x^2 - 486 \times x + 4797 = 0$$

are 13 and 41 .

Let us verity 13 first: $9 \times x^2 - 486 \times x + 4797 = 1521 + (-6318) + (4797) = -4797 + (4797) = 0$

Then verity 41: $9 \times x^2 - 486 \times x + 4797 = 15129 + (-19926) + (4797) = -4797 + (4797) = 0$

Here are still some constants for use:

Constant	Symbol	Value
Mass of proton	m_p	$1.6726231 \times 10^{-27}$ kg
Boltzmann's constant	k	1.381×10^{-23} J/K

Thank you very much for answering these questions!

Please be advised that in this paper there are questions from 32.1 through 32.9. And any one of them may contain more than one sub-question, thus the total number of sub-questions here is around 14, of which 13 should be answered.

***** END OF PAPER, THANKS *****

By: 239 (26 , 34)

THIS IS THE ANSWER AND SOLUTION FOR PAPER NUMBER 33

THIS IS AN EXAMPLE OF PERSONALIZED TESTS.

If needed, please use the following constants.

Constant	Symbol	Value
Acceleration due to earth's gravity	g	$9.80\ \mathrm{m/s^2}$
Avogadro's number	N_A	$6.0221367 \times 10^{23}\ \mathrm{mol^{-1}}$
Boltzmann's constant	k	$1.380658 \times 10^{-23}\ \mathrm{J/K}$
Coulomb's constant	k	$8.99 \times 10^{9}\ \mathrm{N{\cdot}m^2/C^2}$
Electron charge magnitiude	e	$1.60217733 \times 10^{-19}\ \mathrm{C}$
Permeability of free space	μ_0	$1.25663706 \times 10^{-6}\ \mathrm{T{\cdot}m/A}$
Permittivity of free space	ϵ_0	$8.854187817 \times 10^{-12}\ \mathrm{C^2/(N{\cdot}m^2)}$
Pi	π	3.14159265
Planck's constant	h	$6.6260755 \times 10^{-34}\ \mathrm{J{\cdot}s}$
Mass of electron	m_e	$9.1093897 \times 10^{-31}\ \mathrm{kg}$

Constant	Symbol	Value
Mass of neutron	m_n	$1.6749286 \times 10^{-27}\ \mathrm{kg}$
Mass of proton	m_p	$1.6726231 \times 10^{-27}\ \mathrm{kg}$
Speed of light in vacuum	c	299792458. m/s
Universal gravitational constant	G	$6.67259 \times 10^{-11}\ \mathrm{N{\cdot}m^2/kg^2}$
Universal gas constant	R	$8.314510\ \mathrm{J/(mol{\cdot}K)}$

Please be advised that in this paper there are questions from 33.1 through 33.9. And any one of them may contain more than one sub-question, thus the total number of sub-questions here is around 14, of which 13 should be answered.

In this paper, big questions will be generated in the following order:
1 (6) , 2 (4) , 3 (3) , 4 (2) , 5 (1) , 6 (5) , 7 (7) , 8 (8) , 9 (9) .

QUESTION 33.1 (6)
Please answer ONLY 5 of the following 6

questions (Questions 33.1.1 through 33.1.6).

Here are still some constants for use in the following questions:

Constant	Symbol	Value
Boltzmann's constant	k	1.381×10^{-23} J/K
Avogadro's number	N_A	6.022×10^{23} mol^{-1}
Mass of electron	m_e	$9.1093897 \times 10^{-31}$ kg

In this big question of CHOOSE structure, 6 questions will be generated: 1 (7 , 22) , 2 (9 , 24) , 3 (10 , 25) , 4 (13 , 28) , 5 (11 , 26) , 6 (12 , 27) .

Question 33.1.1 (6 , 7 , 22)

Auto-answer:

J. The accelaration (vector) is $(9600.0, 2160.0, -1.2000 \times 10^6) km/h^2$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (40.0, 9.0, -5000.0)N$ and $m = 54.0kg$, bring them into the above equation, then we get

$$\begin{aligned} \mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(40.0, 9.0, -5000.0)N}{54.0kg} \\ &= (0.74074, 0.16667, -92.593)ms^{-2} \\ &= (9600.0, 2160.0, -1.2000 \times 10^6)km/h^2. \end{aligned}$$

Question 33.1.2 (6 , 9 , 24)

Solution:

By using Newton's Law of Universal Gravitation:

$$F = G\frac{(Sun's\ \ mass) \times (Planet's\ \ mass)}{(distance)^2},$$

where $G = 6.67 \times 10^{-11} Nm^2(kg)^{-2}$, the forces can be easily calculated as

The Planet	Mass (kg)	Distanace from Sun (m)	The Force (N)
Mercury	$7.00000000 \times 10^{24}$	$7.000000000 \times 10^{24}$	4.76×10^{-11}
Venus	8.00×10^{24}	8.00×10^{24}	4.17×10^{-11}
Earth	5.00×10^{24}	3.00×10^{24}	1.85×10^{-10}
Mars	9.00×10^{24}	6.00×10^{24}	8.34×10^{-11}
Jupiter	5.00×10^{24}	2.00×10^{24}	4.17×10^{-10}
Saturn	9.00×10^{24}	3.00×10^{24}	3.33×10^{-10}
Uranus	4.00×10^{24}	4.00×10^{24}	8.34×10^{-11}
Neptune	6.00×10^{24}	5.00×10^{24}	8.00×10^{-11}

Answer:

By using Newton's Law of Universal Gravitation:

$$F = G\frac{(Sun's\ \ mass) \times (Planet's\ \ mass)}{(distance)^2},$$

where $G = 6.67 \times 10^{-11} Nm^2(kg)^{-2}$, the forces can be easily calculated as

The Planet	Mass (kg)	Distanace from Sun (m)	The Force (N)
Mercury	$7.00000000 \times 10^{24}$	$7.000000000 \times 10^{24}$	4.76×10^{-11}
Venus	8.00×10^{24}	8.00×10^{24}	4.17×10^{-11}
Earth	5.00×10^{24}	3.00×10^{24}	1.85×10^{-10}
Mars	9.00×10^{24}	6.00×10^{24}	8.34×10^{-11}
Jupiter	5.00×10^{24}	2.00×10^{24}	$4.17 \times 10^{-10}3$
Saturn	9.00×10^{24}	3.00×10^{24}	3.33×10^{-10}
Uranus	4.00×10^{24}	4.00×10^{24}	8.34×10^{-11}
Neptune	6.00×10^{24}	5.00×10^{24}	8.00×10^{-11}

Question 33.1.3 (6 , 10 , 25)

Auto-answer:

A. A truck

Question 33.1.4 (6 , 13 , 28)

Answer:

7;

8;
The operation is MULTIPLICATION and the result is 56.000.

Question 33.1.5 (6 , 11 , 26)

Solution:

Since the possiblity of non-smoking customer is $a = 0.580$, and the possiblity of under 30 years old customer is $b = 4.00 \times 10^{-2}$, the possiblity of smoking customer is $c = 1.0 - a = 1.0 - 0.580 = 0.420$ and the possiblity of equal or above 30 years old customer is $d = 1.0 - b = 1.0 - 4.00 \times 10^{-2} = 0.9600$. So the possibility of smoking and equal or above 30 years old customer is $c \times d = 0.403$.

Answer:

The possibility of smoking and equal or above 30 years old customer is $(1 - a)(1 - b) = 0.403$.

Question 33.1.6 (6 , 12 , 27)

Solution:

Since the possiblity of smoking customer is $a = 0.890$, and the possiblity of equal-or-above 30 years old customer is $b = 0.6400$, the possiblity of non-smoking customer is $c = 1.0 - a = 1.0 - 0.890 = 0.110$ and the possiblity of under 30 years old customer is $d = 1.0 - b = 1.0 - 0.6400 = 0.3600$. Then

Customer	Possibility
smoking and equal-or-above 30 years old	$0.890 \times 0.6400 = 0.570$
smoking and under 30 years old	$0.890 \times 0.3600 = 0.320$
non-smoking and equal-or-above 30 years old	$0.110 \times 0.6400 = 7.04 \times 10^{-2}$
non-smoking and under 30 years old	$0.110 \times 0.3600 = 3.96 \times 10^{-2}$

And the total summation of all possibilities is 1.000.

Answer:

Customer	Possibility
smoking and equal-or-above 30 years old	0.570
smoking and under 30 years old	0.320
non-smoking and equal-or-above 30 years old	7.04×10^{-2}
non-smoking and under 30 years old	3.96×10^{-2}

And the total summation of all possibilities is 1.000.

You have done all the above? A very good beginning, please go ahead. More constants the Mass of electron m_e= 9.109390×10^{-31} kg , Universal gas constant R= 8.315 J/(mol·K) , e= $1.60217733 \times 10^{-19}$ C , and m_p= $1.6726231 \times 10^{-27}$ kg may be very helpful.

QUESTION 33.2 (4 , 4 , 4)

Auto-answer:

Column Left	Column Right	Answers
A. asdf(:)	c	**B.**
B. C	ER	**C.**
C. Er	b	**D.**
D. B	ASDF(:)	**A.**
E. A	a	**E.**

QUESTION 33.3 (3 , 3 , 3)

Auto-answer:

B. Canada has 10 provinces and 3 territories.

QUESTION 33.4 (2 , 2 , 2)

Auto-answer:

E. The accelaration is $(1.1111ms^{-2}, 960.00km/h^2, -148.15ms^{-2})$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (60.000, 4.0000, -8000.0)N$ and $m = 54.0000kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(60.000, 4.0000, -8000.0)N}{54.0000kg} \\
&= (1.1111, 7.4074 \times 10^{-2}, -148.15)ms^{-2} \\
&= (14400., 960.00, -1.9200 \times 10^{6})km/h^{2}.
\end{aligned}$$

QUESTION 33.5 (1 , 1 , 1)

Auto-answer:

C. The accelaration is $(0.833, 6.7 \times 10^{-2}, -33.333)ms^{-2}$.

Answer:

The correct answer from the choices is
C. The accelaration is $(0.833, 6.7 \times 10^{-2}, -33.333)ms^{-2}$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (50.0, 4.0, -2000.0)N$ and $m = 60.0000kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(50.0, 4.0, -2000.0)N}{60.0000kg} \\
&= (0.833, 6.7 \times 10^{-2}, -33.333)ms^{-2}
\end{aligned}$$

QUESTION 33.6 (5 , 5 , 5)

Answer:

The correct answer	F	1. 9 is an even number.
The correct answer	T	2. Toronto is in Ontario province.

The correct answer	T

3. $\mathbf{F} = m\mathbf{a}$ is a mathmatical form of the Newton's Second Law.

You have done all the above? Excellent! Not much left, please continue.

QUESTION 33.7 (7 , 14 , 50)

Auto-answer:

A. The accelaration is $(1.21, 0.16, -120.69)ms^{-2}$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (70.0, 9.0, -7000.0)N$ and $m = 58.0kg$, bring them into the above equation, then we get

$$\begin{aligned}\mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(70.0, 9.0, -7000.0)N}{58.0kg} \\ &= (1.21, 0.16, -120.69)ms^{-2}\end{aligned}$$

QUESTION 33.8 (8 , 15 , 60)

Answer:

$$\begin{pmatrix} 5 & 6 & 6 & 4 \\ 4 & 5 & 6 & 6 \\ 7 & 5 & 4 & 5 \end{pmatrix} \times \begin{pmatrix} 2 \\ 2 \\ 2 \\ 2 \end{pmatrix} = \begin{pmatrix} 42 \\ 42 \\ 42 \end{pmatrix}$$

$$\begin{pmatrix} \Theta & \Lambda \\ \gamma & \delta \\ \Lambda & \varepsilon \\ \alpha & \Xi \end{pmatrix} \begin{pmatrix} \beta \\ \beta \end{pmatrix} = \begin{pmatrix} \Theta \times \beta + \Lambda \times \beta \\ \gamma \times \beta + \delta \times \beta \\ \Lambda \times \beta + \varepsilon \times \beta \\ \alpha \times \beta + \Xi \times \beta \end{pmatrix}$$

Solution:

QUESTION 33.9 (9 , 16 , 70)

Answer:

29, 38

Solution:

Roots to the equation

$$-11 \times x^2 + 737 \times x - 12122 = 0$$

are 29 and 38 .

Let us verity 29 first: $-11 \times x^2 + 737 \times x - 12122 = -9251 + (21373) + (-12122) = 12122 + (-12122) = 0$

Then verity 38: $-11 \times x^2 + 737 \times x - 12122 = -15884 + (28006) + (-12122) = 12122 + (-12122) = 0$

Here are still some constants for use:

Constant	Symbol	Value
Mass of proton	m_p	$1.6726231 \times 10^{-27}$ kg
Boltzmann's constant	k	1.381×10^{-23} J/K

Thank you very much for answering these questions!

Please be advised that in this paper there are questions from 33.1 through 33.9. And any one of them may contain more than one sub-question, thus the total number of sub-questions here is around 14, of which 13 should be answered.

***** END OF PAPER, THANKS *****

By: 239 (26 , 34)

THIS IS THE ANSWER AND SOLUTION FOR PAPER NUMBER 34

THIS IS AN EXAMPLE OF PERSONALIZED TESTS.

If needed, please use the following constants.

Constant	Symbol	Value
Acceleration due to earth's gravity	g	$9.80\ \mathrm{m/s^2}$
Avogadro's number	N_A	$6.0221367 \times 10^{23}\ \mathrm{mol^{-1}}$
Boltzmann's constant	k	$1.380658 \times 10^{-23}\ \mathrm{J/K}$
Coulomb's constant	k	$8.99 \times 10^{9}\ \mathrm{N{\cdot}m^2/C^2}$
Electron charge magnitiude	e	$1.60217733 \times 10^{-19}\ \mathrm{C}$
Permeability of free space	μ_0	$1.25663706 \times 10^{-6}\ \mathrm{T{\cdot}m/A}$
Permittivity of free space	ϵ_0	$8.854187817 \times 10^{-12}\ \mathrm{C^2/(N{\cdot}m^2)}$
Pi	π	3.14159265
Planck's constant	h	$6.6260755 \times 10^{-34}\ \mathrm{J{\cdot}s}$
Mass of electron	m_e	$9.1093897 \times 10^{-31}\ \mathrm{kg}$

Constant	Symbol	Value
Mass of neutron	m_n	$1.6749286 \times 10^{-27}\ \mathrm{kg}$
Mass of proton	m_p	$1.6726231 \times 10^{-27}\ \mathrm{kg}$
Speed of light in vacuum	c	$299792458.\ \mathrm{m/s}$
Universal gravitational constant	G	$6.67259 \times 10^{-11}\ \mathrm{N{\cdot}m^2/kg^2}$
Universal gas constant	R	$8.314510\ \mathrm{J/(mol{\cdot}K)}$

Please be advised that in this paper there are questions from 34.1 through 34.9. And any one of them may contain more than one sub-question, thus the total number of sub-questions here is around 14, of which 13 should be answered.

In this paper, big questions will be generated in the following order:
1 (6) , 2 (5) , 3 (3) , 4 (1) , 5 (4) , 6 (2) , 7 (8) , 8 (7) , 9 (9) .

QUESTION 34.1 (6)
Please answer ONLY 5 of the following 6

questions (Questions 34.1.1 through 34.1.6).

Here are still some constants for use in the following questions:

Constant	Symbol	Value
Boltzmann's constant	k	1.381×10^{-23} J/K
Avogadro's number	N_A	6.022×10^{23} mol^{-1}
Mass of electron	m_e	$9.1093897 \times 10^{-31}$ kg

In this big question of CHOOSE structure, 6 questions will be generated:
1 (6 , 21) , 2 (11 , 26) , 3 (12 , 27) , 4 (8 , 23) , 5 (7 , 22) , 6 (13 , 28) .

Question 34.1.1 (6 , 6 , 21)

Answer:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (80.0, 4.0, -2000.0)N$ and $m = 52.0kg$, bring them into the above equation, then we get

$$\begin{aligned}
\mathbf{a} &= \frac{\mathbf{f}}{m} \\
&= \frac{(80.0, 4.0, -2000.0)N}{52.0kg} \\
&= (1.5385, 7.6923 \times 10^{-2}, -38.462)ms^{-2} \\
&= (19938., 996.92, -498462.)km/h^2.
\end{aligned}$$

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (80.0, 4.0, -2000.0)N$ and $m = 52.0kg$, bring them into the above equation, then we get

$$\begin{aligned}\mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(80.0, 4.0, -2000.0)N}{52.0kg} \\ &= (1.5385, 7.6923 \times 10^{-2}, -38.462)ms^{-2} \\ &= (19938., 996.92, -498462.)km/h^2.\end{aligned}$$

Question 34.1.2 (6 , 11 , 26)

Solution:

Since the possiblity of smoking customer is $a = 0.290$, and the possiblity of equal or above 30 years old customer is $b = 0.3200$, the possiblity of non-smoking customer is $c = 1.0 - a = 1.0 - 0.290 = 0.710$ and the possiblity of under 30 years old customer is $d = 1.0 - b = 1.0 - 0.3200 = 0.6800$. So the possibility of non-smoking and under 30 years old customer is $c \times d = 0.483$.

Answer:

The possibility of non-smoking and under 30 years old customer is $(1 - a)(1 - b) = 0.483$.

Question 34.1.3 (6 , 12 , 27)

Solution:

Since the possiblity of smoking customer is $a = 0.480$, and the possiblity of equal-or-above 30 years old customer is $b = 0.4400$, the possiblity of non-smoking customer is $c = 1.0 - a = 1.0 - 0.480 = 0.520$ and the possiblity of under 30 years old customer is $d = 1.0 - b = 1.0 - 0.4400 = 0.5600$. Then

Customer	Possibility
smoking and equal-or-above 30 years old	$0.480 \times 0.4400 = 0.211$
smoking and under 30 years old	$0.480 \times 0.5600 = 0.269$
non-smoking and equal-or-above 30 years old	$0.520 \times 0.4400 = 0.229$
non-smoking and under 30 years old	$0.520 \times 0.5600 = 0.291$

And the total summation of all possibilities is 1.000.

Answer:

Customer	Possibility
smoking and equal-or-above 30 years old	0.211
smoking and under 30 years old	0.269
non-smoking and equal-or-above 30 years old	0.229
non-smoking and under 30 years old	0.291

And the total summation of all possibilities is 1.000.

Question 34.1.4 (6 , 8 , 23)

Auto-answer:

E. none of these.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (20.0, 4.0, -8000.0)N$ and $m = 54.0kg$, bring them into the above equation, then we get

$$\begin{aligned} \mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(20.0, 4.0, -8000.0)N}{54.0kg} \\ &= (0.37037, 7.4074 \times 10^{-2}, -148.15)ms^{-2} \\ &= (4800.0, 960.00, -1.9200 \times 10^{6})km/h^{2}. \end{aligned}$$

Question 34.1.5 (6 , 7 , 22)

Auto-answer:

D. The accelaration (vector) is $(7476.9, 2243.1, -2.2431 \times 10^{6})km/h^{2}$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (30.0, 9.0, -9000.0)N$ and $m = 52.0kg$, bring them into the above equation, then we get

$$\begin{aligned}\mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(30.0, 9.0, -9000.0)N}{52.0kg} \\ &= (0.57692, 0.17308, -173.08)ms^{-2} \\ &= (7476.9, 2243.1, -2.2431 \times 10^{6})km/h^{2}.\end{aligned}$$

Question 34.1.6 (6 , 13 , 28)

Answer:

1;
4;
The operation is MULTIPLICATION and the result is 4.0000.

You have done all the above? A very good beginning, please go ahead.

More constants the Mass of electron $m_e = 9.109390 \times 10^{-31}$ kg , Universal gas constant $R = 8.315$ J/(mol·K) , $e = 1.60217733 \times 10^{-19}$ C , and $m_p = 1.6726231 \times 10^{-27}$ kg may be very helpful.

QUESTION 34.2 (5 , 5 , 5)

Answer:

The correct answer	T	1. 74 is an even number.
The correct answer	T	2. Toronto is in Ontario province.
The correct answer	T	3. $\lvert\mathbf{F}\rvert = Gm_1m_2r^{-2}$ is a mathmatical form of Newton's Law of Universal Gravitation.

QUESTION 34.3 (3 , 3 , 3)

Auto-answer:

E. Canada has 10 provinces and 3 territories.

QUESTION 34.4 (1 , 1 , 1)
Auto-answer:
G. The accelaration is $(1.55, 0.14, -68.966)ms^{-2}$.
Answer:
The correct answer from the choices is
G. The accelaration is $(1.55, 0.14, -68.966)ms^{-2}$.
Solution:
We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (90.0, 8.0, -4000.0)N$ and $m = 58.0000kg$, bring them into the above equation, then we get

$$\begin{aligned} \mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(90.0, 8.0, -4000.0)N}{58.0000kg} \\ &= (1.55, 0.14, -68.966)ms^{-2} \end{aligned}$$

QUESTION 34.5 (4 , 4 , 4)
Auto-answer:

Column Left	Column Right	Answers
A. asdf(:)	a	**C.**
B. Er	b	**D.**
C. A	eR	**B.**
D. B	ASDF(:)	**A.**
E. A= 4/ 2	a= 2	**E.**

QUESTION 34.6 (2 , 2 , 2)
Auto-answer:
B. The accelaration is $(1.4000ms^{-2}, 777.60km/h^2, -180.00ms^{-2})$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (70.000, 3.0000, -9000.0)N$ and $m = 50.0000kg$, bring them into the above equation, then we get

$$\begin{aligned}\mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(70.000, 3.0000, -9000.0)N}{50.0000kg} \\ &= (1.4000, 6.0000 \times 10^{-2}, -180.00)ms^{-2} \\ &= (18144., 777.60, -2.3328 \times 10^{6})km/h^{2}.\end{aligned}$$

You have done all the above? Excellent! Not much left, please continue.

QUESTION 34.7 (8 , 15 , 60)

Answer:

$$\begin{pmatrix} 5 & 4 & 4 & 6 \\ 6 & 4 & 6 & 4 \\ 5 & 4 & 5 & 5 \end{pmatrix} \times \begin{pmatrix} 2 \\ 2 \\ 2 \\ 2 \end{pmatrix} = \begin{pmatrix} 38 \\ 40 \\ 38 \end{pmatrix}$$

$$\begin{pmatrix} \Delta & \rho \\ \eta & \rho \\ \Xi & \sigma \\ \varepsilon & \epsilon \end{pmatrix} \begin{pmatrix} \beta \\ \beta \end{pmatrix} = \begin{pmatrix} \Delta \times \beta + \rho \times \beta \\ \eta \times \beta + \rho \times \beta \\ \Xi \times \beta + \sigma \times \beta \\ \varepsilon \times \beta + \epsilon \times \beta \end{pmatrix}$$

Solution:

QUESTION 34.8 (7 , 14 , 50)

Auto-answer:

D. The accelaration is $(1.54, 5.8 \times 10^{-2}, -173.08)ms^{-2}$.

Solution:

We will use the Newton's Second Law:

$$\mathbf{f} = m\mathbf{a}.$$

Since $\mathbf{f} = (80.0, 3.0, -9000.0)N$ and $m = 52.0kg$, bring them into the above equation, then we get

$$\begin{aligned}\mathbf{a} &= \frac{\mathbf{f}}{m} \\ &= \frac{(80.0, 3.0, -9000.0)N}{52.0kg} \\ &= (1.54, 5.8 \times 10^{-2}, -173.08)ms^{-2}\end{aligned}$$

QUESTION 34.9 (9 , 16 , 70)

Answer:

-3, 20

Solution:

Roots to the equation

$$-5 \times x^2 + 85 \times x + 300 = 0$$

are -3 and 20 .

Let us verity -3 first: $-5 \times x^2 + 85 \times x + 300 = -45 + (-255) + (300) = -300 + (300) = 0$

Then verity 20: $-5 \times x^2 + 85 \times x + 300 = -2000 + (1700) + (300) = -300 + (300) = 0$

Here are still some constants for use:

Constant	Symbol	Value
Mass of proton	m_p	$1.6726231 \times 10^{-27}$ kg
Boltzmann's constant	k	1.381×10^{-23} J/K

Thank you very much for answering these questions!

Please be advised that in this paper there are questions from 34.1 through 34.9. And any one of them may contain more than one sub-question, thus the total number of sub-questions here is around 14, of which 13 should be answered.

***** END OF PAPER, THANKS *****

By: 239 (26 , 34)

STATISTICS

Initial seed for random numbers	239
First paper number	26
Last paper number	34
Total papers to be generated	9
Total marks from input file	100.00
Total actual marks	100.00
Total lines of the input file	915
Total QUESTIONs in input file	16
Total CHOOSEs in input file	1
Total NOTEs in input file	2
Total (big) questions in each paper	9
Total actual (sub)questions in each paper	14
Total (sub)questions to be answered in each paper	13

For each big question

Big question	Choose?	Questions needed	Questions from	Question IDs
1 (4 ,3.12)	No	1 (1 , 1)	1 (1 ,3.12 ,10.00)	1
2 (4 ,1.56)	No	1 (1 , 1)	2 (0 ,1.56 ,5.00)	2
3 (4 ,1.56)	No	1 (1 , 1)	3 (1 ,1.56 ,5.00)	3
4 (4 ,3.12)	No	1 (1 , 1)	4 (0 ,3.12 ,10.00)	4
5 (4 ,1.56)	No	1 (1 , 1)	5 (0 ,1.56 ,5.00)	5
6 (2 ,62.50 ,40.00)	1	6 (5 , 8)	6 (0 ,12.50 ,5.00)	21
			7 (0 ,12.50 ,5.00)	22
			8 (0 ,12.50 ,6.00)	23
			9 (0 ,12.50 ,8.00)	24
			10 (1 ,12.50 ,5.70)	25
			11 (0 ,12.50 ,12.40)	26
			12 (0 ,12.50 ,24.50)	27

Big question	Choose?	Questions needed	Questions from	Question IDs
			13 (0 ,12.50 ,67.20)	28
7 (8 ,12.50)	No	1 (1 , 1)	14 (1 ,12.50 ,40.00)	50
8 (8 ,12.50)	No	1 (1 , 1)	15 (0 ,12.50 ,40.00)	60
9 (14 ,1.56)	No	1 (1 , 1)	16 (0 ,1.56 ,5.00)	70