PHYSICS

BOOKS - CBSE MODEL PAPER

QUESTION BANK 2021

Real Numbers Case Study Case Study 1

1. To enhance the reading skills of grade X students, the school nominates you and two of your friends to set up a class library. There

are two sections- section A and section Bof

grade X. There are 32 students in section A

and 36 students in section B.

What is the minimum number of books you

will acquire for the class library, so that they

can be distributed equally among students of

Section A or Section B?

A. 144

B. 128

C. 288

D. 272

Answer: C

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2. To enhance the reading skills of grade X students, the school nominates you and two of your friends to set up a class library. There are two sections- section A and section Bof

grade X. There are 32 students in section A and 36 students in section B.

If the product of two positive integers is equal to the product of their HCF and LCM is true then, the HCF (32 , 36) is

A. 2

B. 4

C. 6

D. 8

Answer: B

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3. To enhance the reading skills of grade X students, the school nominates you and two of your friends to set up a class library. There are two sections- section A and section B of grade X. There are 32 students in section A

and 36 students in section B.

36 can be expressed as a product of its primes as

A. $2^2 \times 3^2$

B. $2^1 \times 3^0$

C. $2^3 \times 3^1$

D. $2^0 \times 3^0$

Answer: A

4. To enhance the reading skills of grade X students, the school nominates you and two of your friends to set up a class library. There are two sections- section A and section Bof grade X. There are 32 students in section A and 36 students in section B.

$7 \times 11 \times 13 \times 15 + 15$ is a

A. Prime number

B. Composite number

C. Neither prime nor composite

D. None of the above

Answer: B

5. To enhance the reading skills of grade X students, the school nominates you and two of your friends to set up a class library. There are two sections- section A and section Bof grade X. There are 32 students in section A and 36 students in section B.

If p and q are positive integers such that $p = ab^2$ and $q = a^2b$, where a , b are prime numbers, then the LCM (p, q) is

A. ab

B. a^2b^2

C. a^3b^2

D. a^3b^3

Answer: B

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1. A seminar is being conducted by an Educational Organisation, where the participants will be educators of different subjects. The number of participants in Hindi, English and Mathematics are 60, 84 and 108 respectively.

In each room the same number of participants are to be seated and all of them being in the

same subject, hence maximum number participants that can accommodated in each room are

A. 14

B. 12

C. 16

D. 18

Answer: B

2. A seminar is being conducted by an Educational Organisation, where the participants will be educators of different subjects. The number of participants in Hindi, English and Mathematics are 60, 84 and 108 respectively.

What is the minimum number of rooms required during the event?

   A. 11

B. 31

C. 41

D. 21

Answer: D

 Watch Video Solution

3. A seminar is being conducted by an Educational Organisation, where the participants will be educators of different subjects. The number of participants in Hindi,

English and Mathematics are 60, 84 and 108 respectively.

The LCM of 60, 84 and 108 is

A. 3780

B. 3680

C. 4780

D. 4680

Answer: A

4. A seminar is being conducted by an Educational Organisation, where the participants will be educators of different subjects. The number of participants in Hindi, English and Mathematics are 60, 84 and 108 respectively.

The product of HCF and LCM of 60,84 and 108 is

A. 55360

B. 35360

C. 45500

D. 45360

Answer: D

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5. A seminar is being conducted by an Educational Organisation, where the participants will be educators of different

subjects. The number of participants in Hindi, English and Mathematics are 60, 84 and 108 respectively.

108 can be expressed as a product of its primes as

A. $2^3 \times 3^2$

B. $2^3 \times 3^3$
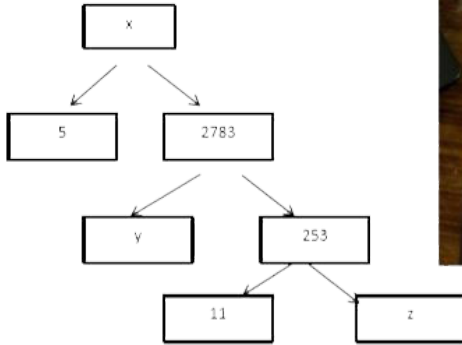
C. $2^2 \times 3^2$

D. $2^2 \times 3^3$

Answer: D

Real Numbers Case Study Case Study 3

1. A Mathematics Exhibition is being conducted in your School and one of your friends is making a model of a factor tree. He has some difficulty and asks for your help in completing a quiz for the audience.

Observe the following factor tree and answer

the following:

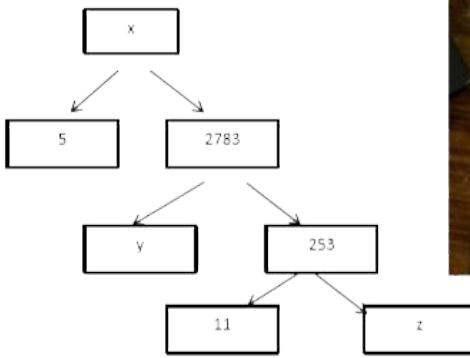What will be the value of x?

A. 15005

B. 13915

C. 56920

D. 17429

Answer: B

2. A Mathematics Exhibition is being conducted in your School and one of your friends is making a model of a factor tree. He has some difficulty and asks for your help in completing a quiz for the audience.

Observe the following factor tree and answer the following:
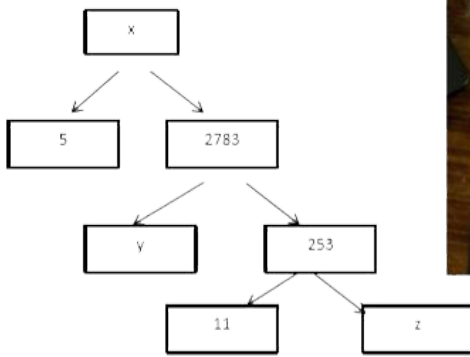
What will be the value of y?

A. 23

B. 22

C. 11

D. 19

Answer: C

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3. A Mathematics Exhibition is being conducted in your School and one of your friends is making a model of a factor tree. He has some difficulty and asks for your help in completing a quiz for the audience.

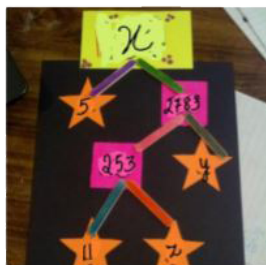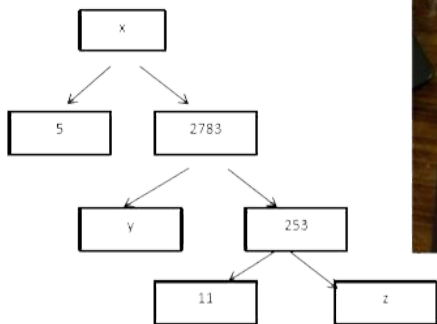Observe the following factor tree and answer the following:

What will be the value of z?

A. 22

B. 23

C. 17

D. 19

Answer: B

▶ Watch Video Solution

4. A Mathematics Exhibition is being conducted in your School and one of your friends is making a model of a factor tree. He has some difficulty and asks for your help in completing a quiz for the audience.

Observe the following factor tree and answer the following:

According to Fundamental Theorem of Arithmetic 13915 is a

A. Composite number

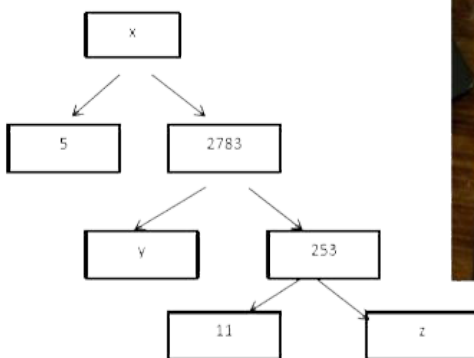B. Prime number

C. Neither prime nor composite

D. Even number

Answer: A

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5. A Mathematics Exhibition is being conducted in your School and one of your friends is making a model of a factor tree. He has some difficulty and asks for your help in completing a quiz for the audience.

Observe the following factor tree and answer the following:

The prime factorisation of 13915 is

A. $5 \times 11^3 \times 13^2$

B. $5 \times 11^3 \times 23^2$

C. $5 \times 11^2 \times 23$

D. $5 \times 11^2 \times 13^2$

Answer: C

Polynomials Case Study 1

1. The below picture are few natural examples of parabolic shape which is represented by a quadratic polynomial. A parabolic arch is an arch in the shape of a parabola. In structures, their curve represents an efficient method of load, and so can be found in bridges and in architecture in a variety of forms.

In the standard form of quadratic polynomial,

$ax^2 + bx + c$ a,b and c are

A. All are real numbers.

B. All are rational numbers.

C. 'a' is a non zero real number and b and c

are any real numbers.

D. All are integers.

Answer: C

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2. The below picture are few natural examples

of parabolic shape which is represented by a

quadratic polynomial. A parabolic arch is an

arch in the shape of a parabola. In structures,

their curve represents an efficient method of load, and so can be found in bridges and in architecture in a variety of forms.

If the roots of the quadratic polynomial are equal, where the discriminant $D = b^2 - 4ac$, then

A. $D > 0$

B. $D < 0$

C. $D \geq 0$

D. $D = 0$

Answer: D

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3. The below picture are few natural examples of parabolic shape which is represented by a quadratic polynomial. A parabolic arch is an

arch in the shape of a parabola. In structures, their curve represents an efficient method of load, and so can be found in bridges and in architecture in a variety of forms.

If a and $\dfrac{1}{a}$ are the zeroes of the qudratic polynomial $2x^2 - x + 8k$ then k is

A. 4

B. $\dfrac{1}{4}$

C. $\dfrac{-1}{4}$

D. 2

Answer: B

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4. The below picture are few natural examples of parabolic shape which is represented by a quadratic polynomial. A parabolic arch is an

arch in the shape of a parabola. In structures, their curve represents an efficient method of load, and so can be found in bridges and in architecture in a variety of forms.

The graph of $x^2 + 1 = 0$

A. Intersects x_axis at two distinct points.

B. Touches x_axis at a point.

C. Neither touches nor intersects x_axis.

D. Either touches or intersects x_ axis.

Answer: C

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5. The below picture are few natural examples of parabolic shape which is represented by a quadratic polynomial. A parabolic arch is an arch in the shape of a parabola. In structures,

their curve represents an efficient method of load, and so can be found in bridges and in architecture in a variety of forms.

If the sum of the roots is -p and product of the roots is $-\dfrac{1}{p}$, then the quadratic polynomial is

A. $k\left(-px^2 + \dfrac{x}{p} + 1 \right)$

B. $k\left(px^2 - \dfrac{x}{p} - 1\right)$

C. $k\left(x^2 + px - \dfrac{1}{p}\right)$

D. $k\left(x^2 - px + \dfrac{1}{p}\right)$

Answer: C

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Polynomials Case Study 2

1. An asana is a body posture, originally and still a general term for a sitting meditation

pose, and later extended in hatha yoga and modern yoga as exercise, to any type of pose or position, adding reclining, standing, inverted, twisting, and balancing poses. In the figure, one can observe that poses can be related to representation of quadratic polynomial.

The shape of the poses shown is

A. Spiral

B. Ellipse

C. Linear

D. Parabola

Answer: D

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2. An asana is a body posture, originally and still a general term for a sitting meditation pose, and later extended in hatha yoga and modern yoga as exercise, to any type of pose

or position, adding reclining, standing, inverted, twisting, and balancing poses. In the figure, one can observe that poses can be related to representation of quadratic polynomial.

The graph of parabola opens downwards, if _____

A. $a \geq 0$

B. $a = 0$

C. $a < 0$

D. $a > 0$

Answer: C

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3. An asana is a body posture, originally and still a general term for a sitting meditation pose, and later extended in hatha yoga and modern yoga as exercise, to any type of pose or position, adding reclining, standing,

inverted, twisting, and balancing poses. In the figure, one can observe that poses can be related to representation of quadratic polynomial.

In the graph, how many zeroes are there for the polynomial?

A. 0

B. 1

C. 2

D. 3

Answer: C

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4. An asana is a body posture, originally and still a general term for a sitting meditation pose, and later extended in hatha yoga and modern yoga as exercise, to any type of pose or position, adding reclining, standing,

inverted, twisting, and balancing poses. In the figure, one can observe that poses can be related to representation of quadratic polynomial.

The two zeroes in the above shown graph are

A. 2, 4

B. $-2, 4$

C. $-8, 4$

D. $2, \; -8$

Answer: B

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5. An asana is a body posture, originally and still a general term for a sitting meditation pose, and later extended in hatha yoga and modern yoga as exercise, to any type of pose or position, adding reclining, standing, inverted, twisting, and balancing poses. In the

figure, one can observe that poses can be related to representation of quadratic polynomial.

The zeroes of the quadratic polynomial $4\sqrt{3}x^2 + 5x - 2\sqrt{3}$ are

A. $\dfrac{2}{\sqrt{3}}, \dfrac{\sqrt{3}}{4}$

B. $-\dfrac{2}{\sqrt{3}}, \dfrac{\sqrt{3}}{4}$

C. $\dfrac{2}{\sqrt{3}}, -\dfrac{\sqrt{3}}{4}$

D. $-\dfrac{2}{\sqrt{3}}, \ -\dfrac{\sqrt{3}}{4}$
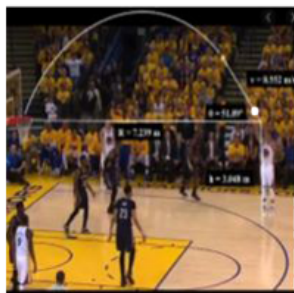
Answer: B

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Polynomials Case Study 3

1. Basketball and soccer are played with a spherical ball. Even though an athlete dribbles the ball in both sports, a basketball player uses his hands and a soccer player uses his

feet. Usually, soccer is played outdoors on a large field and basketball is played indoor on a court made out of wood. The projectile (path traced) of soccer ball and basketball are in the form of parabola representing quadratic polynomial.
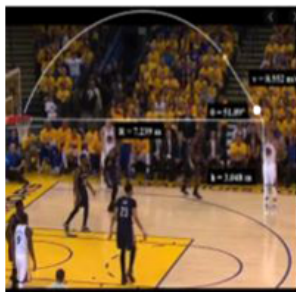
The shape of the path traced shown is

A. Spiral

B. Ellipse

C. Linear

D. Parabola

Answer: D

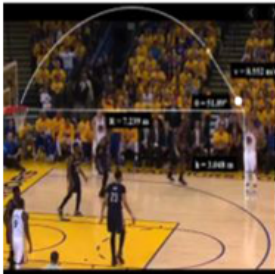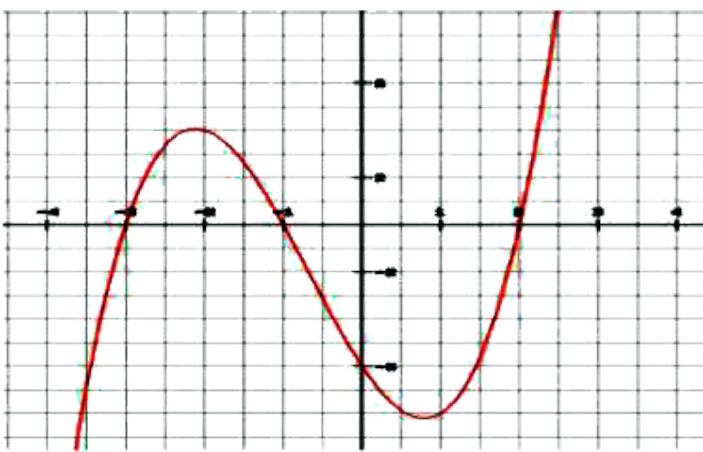▶ **Watch Video Solution**

2. Basketball and soccer are played with a spherical ball. Even though an athlete dribbles the ball in both sports, a basketball player uses his hands and a soccer player uses his feet. Usually, soccer is played outdoors on a

large field and basketball is played indoor on a court made out of wood. The projectile (path traced) of soccer ball and basketball are in the form of parabola representing quadratic polynomial.

The graph of parabola opens upwards, if

_____

A. a = 0

B. $a < 0$

C. $a > 0$

D. $a \geq 0$

Answer: C

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3. Basketball and soccer are played with a spherical ball. Even though an athlete dribbles the ball in both sports, a basketball player uses his hands and a soccer player uses his feet. Usually, soccer is played outdoors on a

large field and basketball is played indoor on a court made out of wood. The projectile (path traced) of soccer ball and basketball are in the form of parabola representing quadratic polynomial.

Observe the following graph and answer

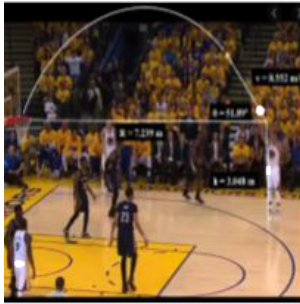In the above graph, how many zeroes are there for the polynomial?

A. 0

B. 1

C. 2

D. 3

Answer: D

4. Basketball and soccer are played with a spherical ball. Even though an athlete dribbles the ball in both sports, a basketball player uses his hands and a soccer player uses his feet. Usually, soccer is played outdoors on a large field and basketball is played indoor on a court made out of wood. The projectile (path traced) of soccer ball and basketball are in the

form of parabola representing quadratic polynomial.

The three zeroes in the above shown graph are

    A. 2, 3,-1

    B. $- 2, 3, 1$

    C. $- 3, - 1, 2$

    D. $- 2, - 3, - 1$

Answer: C

5. Basketball and soccer are played with a spherical ball. Even though an athlete dribbles the ball in both sports, a basketball player uses his hands and a soccer player uses his feet. Usually, soccer is played outdoors on a large field and basketball is played indoor on a court made out of wood. The projectile (path traced) of soccer ball and basketball are in the

form of parabola representing quadratic
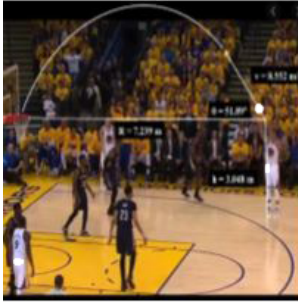
polynomial.

What will be the expression of the polynomial

?

A. $x^3 + 2x^2 - 5x - 6$

B. $x^3 + 2x^2 - 5x + 6$

C. $x^3 + 2x^2 + 5x - 6$

D. $x^3 + 2x^2 + 5x + 6$

Answer: A

Linear Equations Intwo Variables Case Study 1

1. A test consists of 'True' or 'False' questions. One mark is awarded for every correct answer while $\dfrac{1}{4}$ mark is deducted for every wrong answer. A student knew answers to some of the questions. Rest of the questions he attempted by guessing. He answered 120

questions and got 90 marks.

Type of Question	Marks given for correct answer	Marks deducted for wrong answer
True/False	1	0.25

If answer to all questions he attempted by guessing were wrong, then how many questions did he answer correctly?

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2. A test consists of 'True' or 'False' questions. One mark is awarded for every correct answer while $\dfrac{1}{4}$ mark is deducted for every wrong answer. A student knew answers to some of

the questions. Rest of the questions he attempted by guessing. He answered 120 questions and got 90 marks.

Type of Question	Marks given for correct answer	Marks deducted for wrong answer
True/False	1	0.25

How many questions did he guess?

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3. A test consists of 'True' or 'False' questions. One mark is awarded for every correct answer while $\dfrac{1}{4}$ mark is deducted for every wrong answer. A student knew answers to some of

the questions. Rest of the questions he attempted by guessing. He answered 120 questions and got 90 marks.

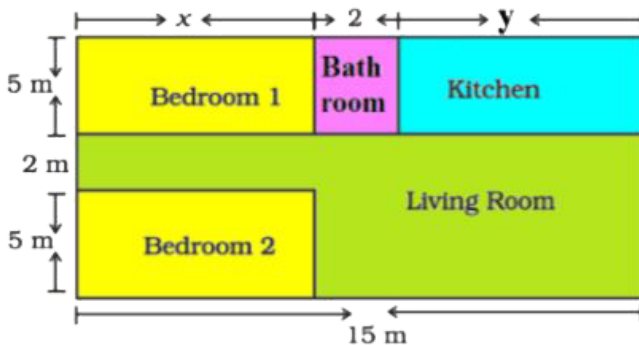| Type of Question	Marks given for correct answer	Marks deducted for wrong answer
True/False	1	0.25

If answer to all questions he attempted by guessing were wrong and answered 80 correctly, then how many marks he got?

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4. A test consists of 'True' or 'False' questions. One mark is awarded for every correct answer

while $\dfrac{1}{4}$ mark is deducted for every wrong answer. A student knew answers to some of the questions. Rest of the questions he attempted by guessing. He answered 120 questions and got 90 marks.

Type of Question	Marks given for correct answer	Marks deducted for wrong answer
True/False	1	0.25

If answer to all questions he attempted by guessing were wrong, then how many questions answered correctly to score 95 marks?

1. Amit is planning to buy a house and the layout is given below. The design and the measurement has been made such that areas of two bedrooms and kitchen together is 95 sq.m.

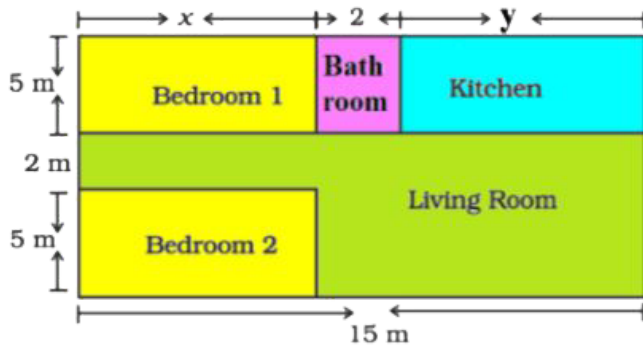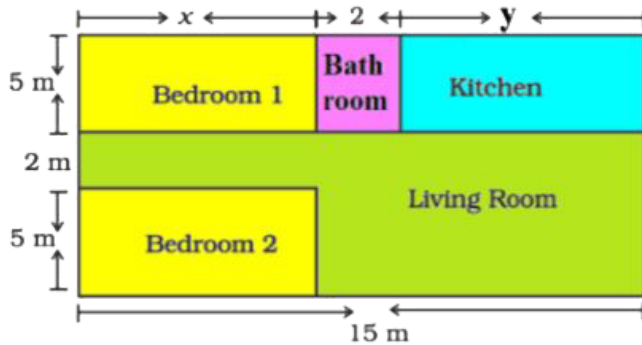Based on the above information, answer the

following questions:

Form the pair of linear equations in two variables from this situation.

2. Amit is planning to buy a house and the layout is given below. The design and the measurement has been made such that areas of two bedrooms and kitchen together is 95 sq.m.

Based on the above information, answer the following questions:

Find the length of the outer boundary of the layout.

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3. Amit is planning to buy a house and the layout is given below. The design and the

measurement has been made such that areas of two bedrooms and kitchen together is 95 sq.m.
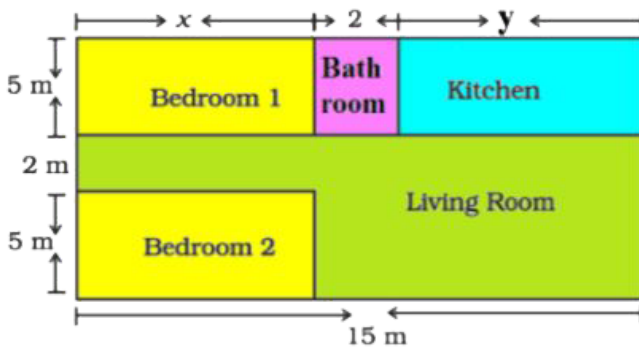

Based on the above information, answer the following questions:

Find the area of each bedroom and kitchen in the layout.

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4. Amit is planning to buy a house and the layout is given below. The design and the measurement has been made such that areas of two bedrooms and kitchen together is 95 sq.m.
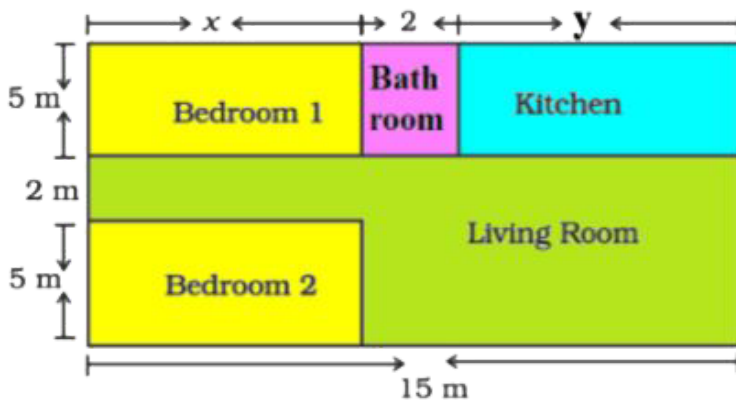

Based on the above information, answer the following questions:

Find the area of living room in the layout.

5. Amit is planning to buy a house and the layout is given below. The design and the measurement has been made such that areas of two bedrooms and kitchen together is 95 sq.m.

Based on the above information, answer the

following questions:

Find the cost of laying tiles in kitchen at the rate of Rs. 50 per sq.m

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Linear Equations Intwo Variables Case Study 3

1. It is common that Governments revise travel fares from time to time based on various factors such as inflation (a general increase in prices and fall in the purchasing value of

money) on different types of vehicles like auto, Rickshaws, taxis, Radio cab etc. The auto charges in a city comprise of a fixed charge together with the charge for the distance covered. Study the following situations

Name of the city	Distance travelled (Km)	Amount paid (Rs.)
City A	10	75
	15	110
City B	8	91
	14	145

Situation 1: In city A, for a journey of 10 km, the charge paid is Rs 75 and for a journey of 15 km, the charge paid is Rs 110.

Situation 2: In a city B, for a journey of 8km,

the charge paid is Rs91 and for a journey of 14km, the charge paid is Rs 145.

If the fixed charges of auto rickshaw be Rs x and the running charges be Rs y km/hr, the pair of linear equations representing the situation is

    A. $x + 10y = 110$, $x + 15y = 75$

    B. $x + 10y = 75$, $x + 15y = 110$

    C. $10x + y = 110$, $15x + y = 75$

    D. $10x + y = 75$, $15x + y = 110$

Answer: B

2. It is common that Governments revise travel fares from time to time based on various factors such as inflation (a general increase in prices and fall in the purchasing value of money) on different types of vehicles like auto, Rickshaws, taxis, Radio cab etc. The auto charges in a city comprise of a fixed charge together with the charge for the distance covered. Study the following situations

Name of the city	Distance travelled (Km)	Amount paid (Rs.)
City A	10	75
	15	110
City B	8	91
	14	145

Situation 1: In city A, for a journey of 10 km, the charge paid is Rs 75 and for a journey of 15 km, the charge paid is Rs 110.

Situation 2: In a city B, for a journey of 8km, the charge paid is Rs91 and for a journey of 14km, the charge paid is Rs 145.

Refer to situation 1:

A person travels a distance of 50km. The amount he has to pay is

A. Rs.155

B. Rs.255

C. Rs.355

D. Rs.455

Answer: C

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3. It is common that Governments revise travel

fares from time to time based on various

factors such as inflation (a general increase in

prices and fall in the purchasing value of money) on different types of vehicles like auto, Rickshaws, taxis, Radio cab etc. The auto charges in a city comprise of a fixed charge together with the charge for the distance covered. Study the following situations

Name of the city	Distance travelled (Km)	Amount paid (Rs.)
City A	10	75
	15	110
City B	8	91
	14	145

Situation 1: In city A, for a journey of 10 km, the charge paid is Rs 75 and for a journey of 15 km, the charge paid is Rs 110.

Situation 2: In a city B, for a journey of 8km, the charge paid is Rs91 and for a journey of 14km, the charge paid is Rs 145.

Refer to situation 2:

What will a person have to pay for travelling a distance of 30km?

A. Rs.185

B. Rs.289

C. Rs.275

D. Rs.305

Answer: B

Linear Equations Intwo Variables

1. It is common that Governments revise travel fares from time to time based on various factors such as inflation (a general increase in prices and fall in the purchasing value of money) on different types of vehicles like auto, Rickshaws, taxis, Radio cab etc. The auto charges in a city comprise of a fixed charge together with the charge for the distance
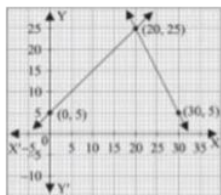
covered. Study the following situations

Name of the city	Distance travelled (Km)	Amount paid (Rs.)
City A	10	75
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City B	8	91
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Situation 1: In city A, for a journey of 10 km, the charge paid is Rs 75 and for a journey of 15 km, the charge paid is Rs 110.
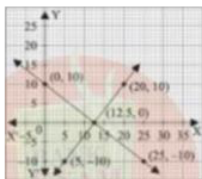
Situation 2: In a city B, for a journey of 8km, the charge paid is Rs91 and for a journey of 14km, the charge paid is Rs 145.

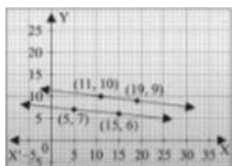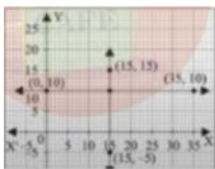The graph of lines representing the conditions are: (situation 2)

A.

B.

C.

D.

Answer: C

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1. Raj and Ajay are very close friends. Both the families decide to go to Ranikhet by their own cars. Raj's car travels at a speed of x km/h while Ajay's car travels 5 km/h faster than Raj's car. Raj took 4 hours more than Ajay to complete the journey of 400 km.

What will be the distance covered by Ajay's car in two hours?

A. 2(x +5)km

B. (x - 5)km

C. 2(x + 10)km

D. (2x + 5)km

Answer: A

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2. Raj and Ajay are very close friends. Both the families decide to go to Ranikhet by their own cars. Raj's car travels at a speed of x km/h while Ajay's car travels 5 km/h faster than Raj's car. Raj took 4 hours more than Ajay to complete the journey of 400 km.

Which of the following quadratic equation describe the speed of Raj's car?

A. $x^2 - 5x - 500 = 0$

B. $x^2 + 4x - 400 = 0$

C. $x^2 + 5x - 500 = 0$

D. $x^2 - 4x + 400 = 0$

Answer: C

▶ **Watch Video Solution**

3. Raj and Ajay are very close friends. Both the families decide to go to Ranikhet by their own cars. Raj's car travels at a speed of x km/h

while Ajay's car travels 5 km/h faster than Raj's car. Raj took 4 hours more than Ajay to complete the journey of 400 km.

What is the speed of Raj's car ?

    A. 20 km/hour

    B. 15 km/hour

    C. 25 km/hour

D. 10 km/hour

Answer: A

▶ **Watch Video Solution**

4. Raj and Ajay are very close friends. Both the families decide to go to Ranikhet by their own cars. Raj's car travels at a speed of x km/h while Ajay's car travels 5 km/h faster than Raj's car. Raj took 4 hours more than Ajay to complete the journey of 400 km.

How much time took Ajay to travel 400 km?

A. 20 hour

B. 40 hour

C. 25 hour

D. 16 hour

Answer: D

Quadratic Equations Case Study 2

1. The speed of a motor boat is 20 km/hr. For covering the distance of 15 km the boat took 1 hour more for upstream than downstream.

Let speed of the stream be x km/hr. then speed of the motorboat in upstream will be

A. 20 km/hr

B. (20 + x) km/hr

C. (20 - x) km/hr

D. 2 km/hr

Answer: C

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2. The speed of a motor boat is 20 km/hr. For covering the distance of 15 km the boat took 1 hour more for upstream than downstream.

What is the relation between speed ,distance and time?

A. speed = (distance)/time

B. distance = (speed)/time

C. time = speed x distance

D. speed = distance x time

Answer: B

▶ Watch Video Solution

3. The speed of a motor boat is 20 km/hr. For covering the distance of 15 km the boat took 1 hour more for upstream than downstream.

Which is the correct quadratic equation for the speed of the current ?

A. $x^2 + 30x - 200 = 0$

B. $x^2 + 20x - 400 = 0$

C. $x^2 + 30x - 400 = 0$

D. $x^2 - 20x - 400 = 0$

Answer: C

▶ **Watch Video Solution**

4. The speed of a motor boat is 20 km/hr. For covering the distance of 15 km the boat took 1 hour more for upstream than downstream.

What is the speed of current ?

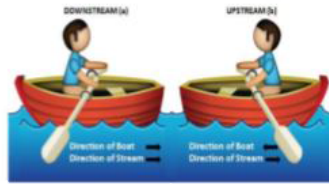A. 20 km/hour

B. 10 km/hour

C. 15 km/hour

D. 25 km/hour

Answer: B

▶ **Watch Video Solution**

5. The speed of a motor boat is 20 km/hr. For covering the distance of 15 km the boat took 1 hour more for upstream than downstream.

How much time boat took in downstream?

A. 90 minute

B. 15 minute

C. 30 minute

D. 45 minute

Answer: C

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1. India is competitive manufacturing location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6th year and 22600 in 9th year.

Based on the above information, answer the following questions:

Find the production during first year.

Watch Video Solution

2. India is competitive manufacturing location due to the low cost of manpower and strong

technical and engineering capabilities contributing to higher quality production runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6th year and 22600 in 9th year.

Based on the above information, answer the following questions:

Find the production during 8th year.

3. India is competitive manufacturing location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6th year and 22600 in 9th year.

Based on the above information, answer the following questions:

Find the production during first 3 years.

4. India is competitive manufacturing location due to the low cost of manpower and strong

technical and engineering capabilities contributing to higher quality production runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6th year and 22600 in 9th year.

Based on the above information, answer the following questions:

In which year, the production is Rs 29,200.

5. India is competitive manufacturing location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6th year and 22600 in 9th year.

Based on the above information, answer the following questions:

Find the difference of the production during 7th year and 4th year.

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Arithmetic Progression Case Study 2

1. Your friend Veer wants to participate in a 200m race. He can currently run that distance in 51 seconds and with each day of practice it takes him 2 seconds less.He wants to do in 31 seconds .

Which of the following terms are in AP for the given situation

A. 51,53,55....

B. 51, 49, 47....

C. $-51,\ -53,\ -55....$

D. 51, 55, 59...

Answer: B

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2. Your friend Veer wants to participate in a 200m race. He can currently run that distance in 51 seconds and with each day of practice it takes him 2 seconds less.He wants to do in 31

seconds .

What is the minimum number of days he needs to practice till his goal is achieved

A. 10

B. 12

C. 11

D. 9

Answer: B

3. Your friend Veer wants to participate in a 200m race. He can currently run that distance in 51 seconds and with each day of practice it takes him 2 seconds less.He wants to do in 31 seconds .

Which of the following term is not in the AP of the above given situation

A. 41

B. 30

C. 37

D. 39

Answer: B

4. Your friend Veer wants to participate in a 200m race. He can currently run that distance in 51 seconds and with each day of practice it takes him 2 seconds less.He wants to do in 31 seconds .

If n^{th} term of an AP is given by $a_n = 2n + 3$ then common difference of an AP is

A. 2

B. 3

C. 5

D. 1

Answer: A

▶ **Watch Video Solution**

5. Your friend Veer wants to participate in a 200m race. He can currently run that distance in 51 seconds and with each day of practice it takes him 2 seconds less.He wants to do in 31 seconds .

The value of x, for which 2x, x+ 10, 3x + 2 are three consecutive terms of an AP

A. 6

B. -6

C. 18

D. -18

Answer: A

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Arithmetic Progression Case Study 3

1. Your elder brother wants to buy a car and plans to take loan from a bank for his car. He repays his total loan of Rs 1,18,000 by paying every month starting with the first instalment of Rs 1000. If he increases the instalment by Rs 100 every month , answer the following:

The amount paid by him in 30th installment is

A. 3900

B. 3500

C. 3700

D. 3600

Answer: A

▶ **Watch Video Solution**

2. Your elder brother wants to buy a car and

plans to take loan from a bank for his car. He

repays his total loan of Rs 1,18,000 by paying

every month starting with the first instalment

of Rs 1000. If he increases the instalment by Rs

100 every month , answer the following:

The amount paid by him in the 30 installments

is

A. 37000

B. 73500

C. 75300

D. 75000

Answer: B

3. Your elder brother wants to buy a car and plans to take loan from a bank for his car. He repays his total loan of Rs 1,18,000 by paying every month starting with the first instalment of Rs 1000. If he increases the instalment by Rs 100 every month , answer the following:

What amount does he still have to pay after 30th installment?

A. 45500

B. 49000

C. 44500

D. 54000

Answer: C

4. Your elder brother wants to buy a car and plans to take loan from a bank for his car. He repays his total loan of Rs 1,18,000 by paying every month starting with the first instalment of Rs 1000. If he increases the instalment by Rs 100 every month , answer the following:

If total installments are 40 then amount paid in the last installment?

A. 4900

B. 3900

C. 5900

D. 9400

Answer: A

5. Your elder brother wants to buy a car and plans to take loan from a bank for his car. He repays his total loan of Rs 1,18,000 by paying every month starting with the first instalment of Rs 1000. If he increases the instalment by Rs 100 every month , answer the following:

The ratio of the 1st installment to the last installment is

A. $1 : 49$

B. $10 : 49$

C. $10 : 38$

D. $39 : 10$

Answer: B

▶ **Watch Video Solution**

Vijay's House   Tower   Ajay's House
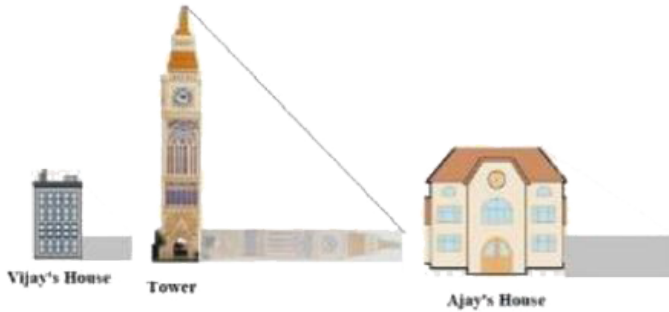
6.

Vijay is trying to find the average height of a tower near his house. He is using the properties of similar triangles.The height of Vijay's house if 20m when Vijay's house casts a shadow 10m long on the ground. At the same time, the tower casts a shadow 50m long on the ground and the house of Ajay casts 20m

shadow on the ground.
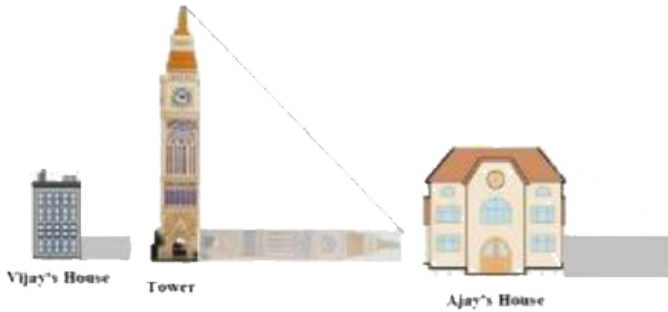
What is the height of the tower?

A. 20 m

B. 50 m

C. 100 m

D. 200 m

Answer: C

Similar Triangles Case Study 1

Vijay's House   Tower   Ajay's House
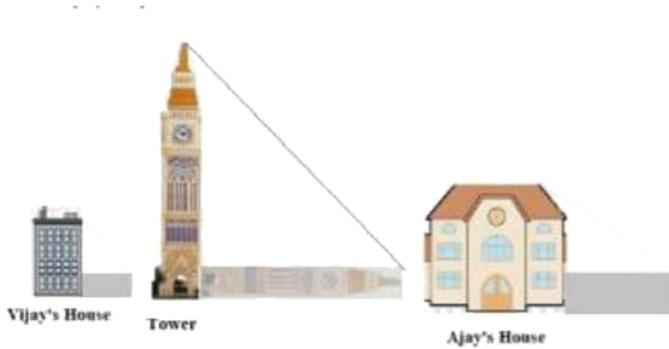
1.

Vijay is trying to find the average height of a tower near his house. He is using the properties of similar triangles.The height of Vijay's house if 20m when Vijay's house casts a shadow 10m long on the ground. At the same time, the tower casts a shadow 50m long on the ground and the house of Ajay casts 20m

shadow on the ground.

What will be the length of the shadow of the tower when Vijay's house casts a shadow of 12m?

A. 75m

B. 50m

C. 45m

D. 60m

Answer: D

Vijay's House   Tower   Ajay's House
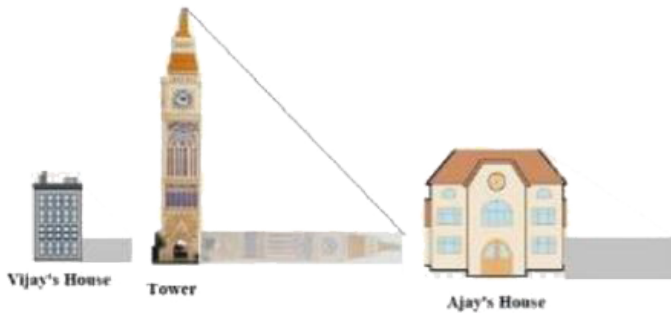
2.

Vijay is trying to find the average height of a tower near his house. He is using the properties of similar triangles.The height of Vijay's house if 20m when Vijay's house casts a shadow 10m long on the ground. At the same time, the tower casts a shadow 50m long on the ground and the house of Ajay casts 20m

shadow on the ground.

What is the height of Ajay's house?

A. 30m

B. 40m

C. 50m

D. 20m

Answer: B

▶ **Watch Video Solution**

Vijay's House   Tower   Ajay's House

3.

Vijay is trying to find the average height of a tower near his house. He is using the properties of similar triangles.The height of Vijay's house if 20m when Vijay's house casts a shadow 10m long on the ground. At the same time, the tower casts a shadow 50m long on the ground and the house of Ajay casts 20m shadow on the ground.

When the tower casts a shadow of 40m, same time what will be the length of the shadow of Ajay's house?

A. 16m

B. 32m

C. 20m

D. 8m

Answer: A

▶ **Watch Video Solution**

Vijay's House   Tower
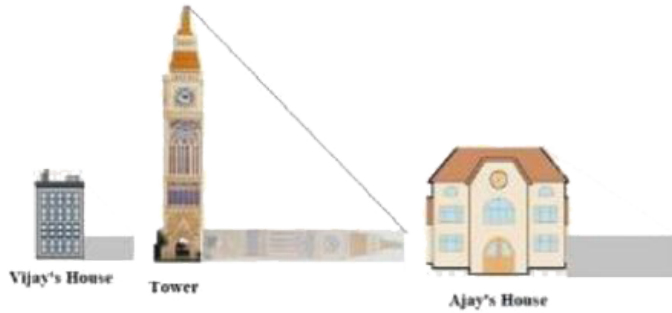
Ajay's House

4.

Vijay is trying to find the average height of a tower near his house. He is using the properties of similar triangles.The height of Vijay's house if 20m when Vijay's house casts a shadow 10m long on the ground. At the same time, the tower casts a shadow 50m long on the ground and the house of Ajay casts 20m shadow on the ground.

When the tower casts a shadow of 40m, same

time what will be the length of the shadow of Vijay's house?

A. 15m

B. 32m

C. 16m

D. 8m

Answer: D

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Similar Triangles Case Study 2

1. Rohan wants to measure the distance of a pond during the visit to his native. He marks points A and B on the opposite edges of a pond as shown in the figure below. To find the distance between the points, he makes a right-angled triangle using rope connecting B with another point C are a distance of 12m, connecting C to point D at a distance of 40m from point C and the connecting D to the point A which is are a distance of 30m from D such the $\angle DC = 90^0$
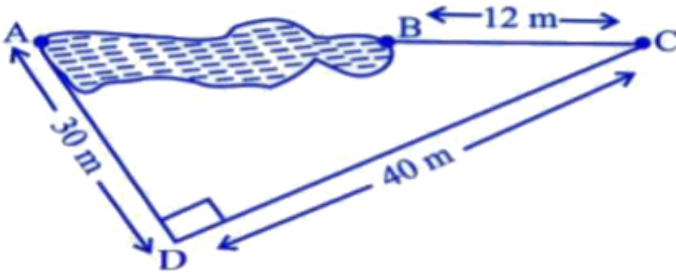
Which property of geometry will be used to find the distance AC?

A. Similarity of triangles

B. Thales Theorem

C. Pythagoras Theorem

D. Area of similar triangles

Answer: C

2. Rohan wants to measure the distance of a pond during the visit to his native. He marks points A and B on the opposite edges of a pond as shown in the figure below. To find the distance between the points, he makes a right-angled triangle using rope connecting B with another point C are a distance of 12m, connecting C to point D at a distance of 40m from point C and the connecting D to the point A which is are a distance of 30m from D

such the $\angle DC = 90^0$
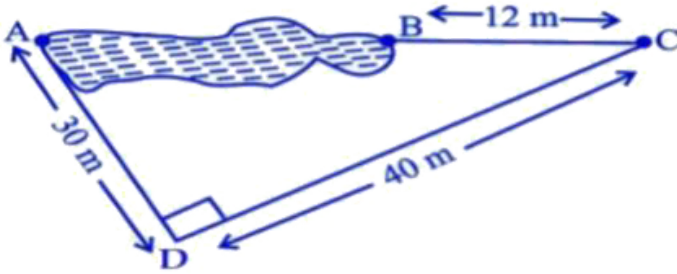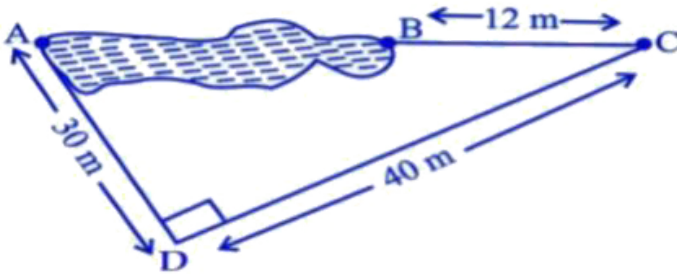

What is the distance AC?

A. 50m

B. 12m

C. 100m

D. 70m

Answer: A

3. Rohan wants to measure the distance of a pond during the visit to his native. He marks points A and B on the opposite edges of a pond as shown in the figure below. To find the distance between the points, he makes a right-angled triangle using rope connecting B with another point C are a distance of 12m, connecting C to point D at a distance of 40m from point C and the connecting D to the point A which is are a distance of 30m from D

such the $\angle DC = 90^0$
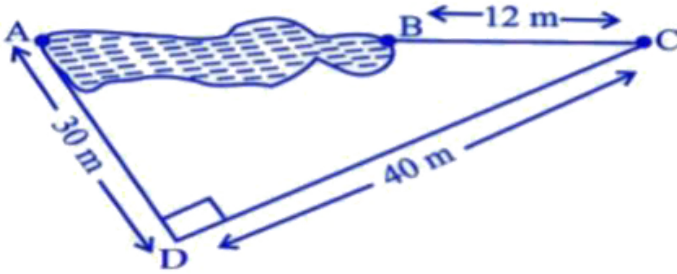
Which is the following does not form a Pythagoras triplet?

A. (7,24,25)

B. (15,8,17)

C. (5,12,13)

D. (21,20,28)

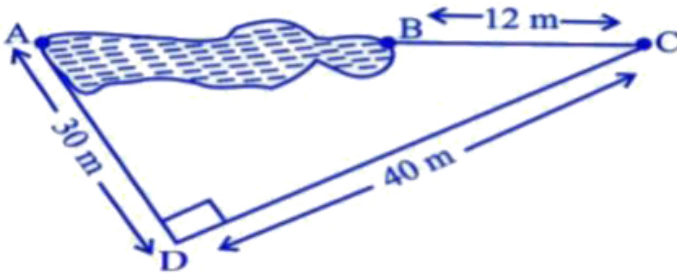**Answer: D**

4. Rohan wants to measure the distance of a pond during the visit to his native. He marks points A and B on the opposite edges of a pond as shown in the figure below. To find the distance between the points, he makes a right-angled triangle using rope connecting B with another point C are a distance of 12m, connecting C to point D at a distance of 40m

from point C and the connecting D to the

point A which is are a distance of 30m from D

such the $\angle DC = 90^0$

Find the length AB?

A. 12m

B. 38m

C. 50m

D. 100m

Answer: B

5. Rohan wants to measure the distance of a pond during the visit to his native. He marks points A and B on the opposite edges of a pond as shown in the figure below. To find the distance between the points, he makes a right-angled triangle using rope connecting B with another point C are a distance of 12m, connecting C to point D at a distance of 40m

from point C and the connecting D to the

point A which is are a distance of 30m from D

such the $\angle DC = 90^0$

Find the length of the rope used.

A. 120m

B. 70m

C. 82m

D. 22m

Answer: C

Scale Factor Case Study

1. A scale drawing of an object is the same shape at the object but a different size. The scale of a drawing is a comparison of the length used on a drawing to the length it represents. The scale is written as a ratio. The ratio of two corresponding sides in similar

figures is called the scale factor.

Scale factor= length in image / corresponding length in object.

If one shape can become another using revising, then the shapes are similar. Hence, two shapes are similar when one can become the other after a resize, flip, slide or turn. In the photograph below showing the side view of a train engine. Scale factor is 1:200.

This means that a length of 1 cm on the

photograph above corresponds to a length of 200cm or 2 m, of the actual engine. The scale can also be written as the ratio of two lengths. If the length of the model is 11cm, then the overall length of theengine in the photograph above, including the couplings(mechanism used to connect) is:

A. 22 cm

B. 220 cm

C. 220 m

D. 22 m

Answer: A

2. A scale drawing of an object is the same shape at the object but a different size. The scale of a drawing is a comparison of the length used on a drawing to the length it represents. The scale is written as a ratio. The ratio of two corresponding sides in similar figures is called the scale factor.

Scale factor= length in image / corresponding

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This means that a length of 1 cm on the photograph above corresponds to a length of 200cm or 2 m, of the actual engine. The scale

can also be written as the ratio of two lengths. What will affect the similarity of any two polygons?

   A. They are flipped horizontally

   B. They are dilated by a scale factor

   C. They are translated down

   D. They are not the mirror image of one another.

Answer: D

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3. A scale drawing of an object is the same shape at the object but a different size. The scale of a drawing is a comparison of the length used on a drawing to the length it represents. The scale is written as a ratio. The ratio of two corresponding sides in similar figures is called the scale factor.

Scale factor= length in image / corresponding length in object.

If one shape can become another using revising, then the shapes are similar. Hence,

two shapes are similar when one can become the other after a resize, flip, slide or turn. In the photograph below showing the side view of a train engine. Scale factor is 1:200.

This means that a length of 1 cm on the photograph above corresponds to a length of 200cm or 2 m, of the actual engine. The scale can also be written as the ratio of two lengths. What is the actual width of the door if the width of the door in photograph is 0.35cm?

A. $0.7m$

B. $0.7cm$

C. $0.07cm$

D. $0.07m$

Answer: A

▶ **Watch Video Solution**

4. A scale drawing of an object is the same shape at the object but a different size. The scale of a drawing is a comparison of the

length used on a drawing to the length it represents. The scale is written as a ratio. The ratio of two corresponding sides in similar figures is called the scale factor.

Scale factor= length in image / corresponding length in object.

If one shape can become another using revising, then the shapes are similar. Hence, two shapes are similar when one can become the other after a resize, flip, slide or turn. In the photograph below showing the side view of a train engine. Scale factor is 1:200.

This means that a length of 1 cm on the photograph above corresponds to a length of 200cm or 2 m, of the actual engine. The scale can also be written as the ratio of two lengths. If two similar triangles have a scale factor 5:3 which statement regarding the two triangles is true?

    A. The ratio of their perimeters is 15:1

    B. Their altitudes have a ratio 25:15

C. Their medians have a ratio 10:4

D. Their angle bisectors have a ratio 11:5

Answer: B

▶ **Watch Video Solution**

5. A scale drawing of an object is the same shape at the object but a different size. The scale of a drawing is a comparison of the length used on a drawing to the length it represents. The scale is written as a ratio. The

ratio of two corresponding sides in similar figures is called the scale factor.

Scale factor= length in image / corresponding length in object.

If one shape can become another using revising, then the shapes are similar. Hence, two shapes are similar when one can become the other after a resize, flip, slide or turn. In the photograph below showing the side view of a train engine. Scale factor is 1:200.

This means that a length of 1 cm on the photograph above corresponds to a length of 200cm or 2 m, of the actual engine. The scale can also be written as the ratio of two lengths.

The length of AB in the given figure:
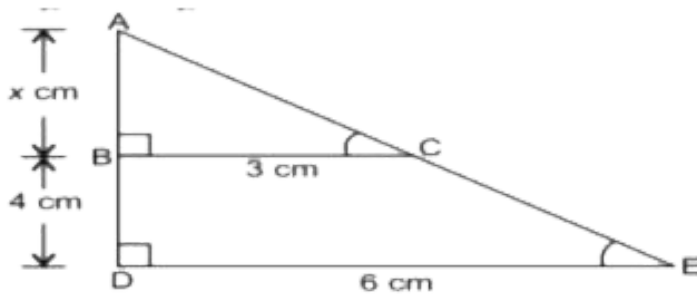
A. 8 cm

B. 6 cm

C. 4 cm

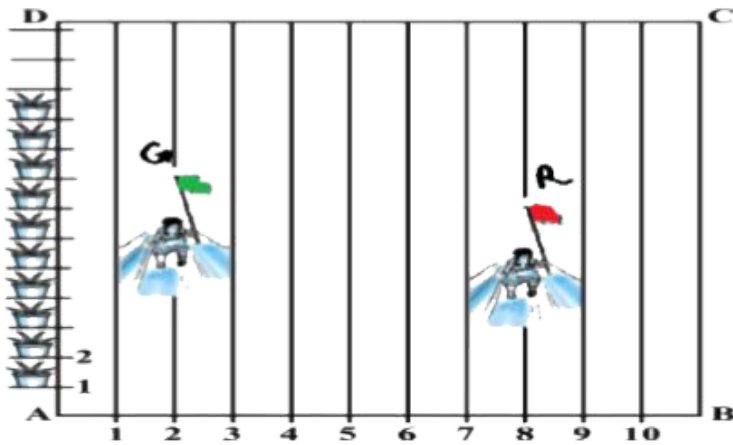D. 10 cm

Answer: C

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Coordinate Geometry Case Study 1
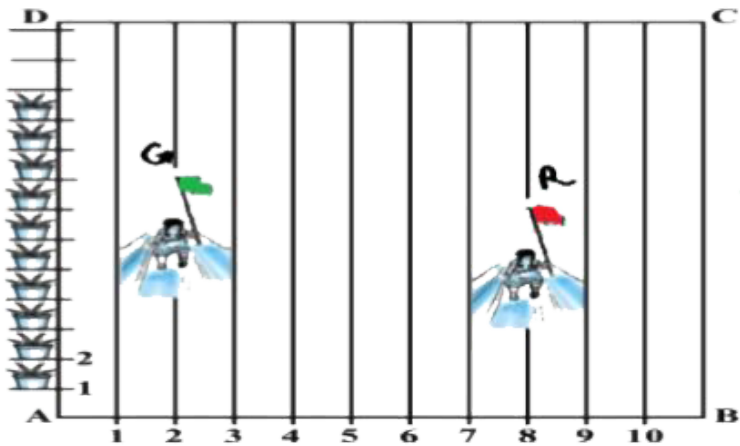
1. In order to conduct Sports Day activities in your School, lines have been drawn with chalk powder at a distance of 1 m each, in a rectangular shaped ground ABCD, 100

flowerpots have been placed at a distance of 1 m from each other along AD, as shown in given figure below. Niharika runs 1/4 th the distance AD on the 2nd line and posts a green flag. Preet runs 1/5 th distance AD on the eighth line and posts a red flag.
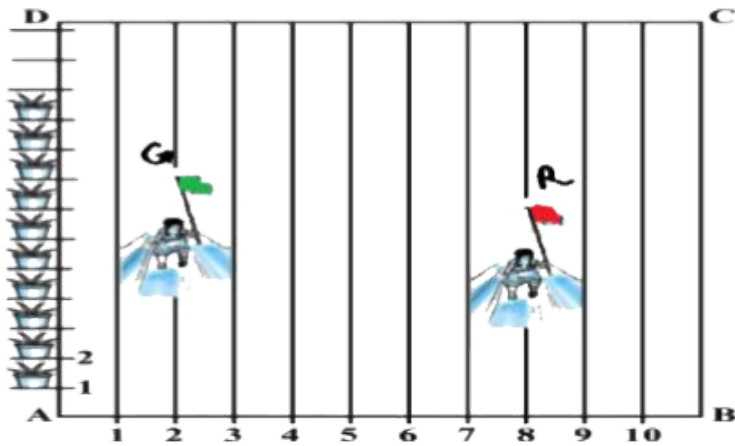
Find the position of green flag

A. (2,25)

B. (2,0.25)

C. (25,2)

D. (0, -25)

Answer: A

2. In order to conduct Sports Day activities in your School, lines have been drawn with chalk powder at a distance of 1 m each, in a rectangular shaped ground ABCD, 100

flowerpots have been placed at a distance of 1 m from each other along AD, as shown in given figure below. Niharika runs 1/4 th the distance AD on the 2nd line and posts a green flag. Preet runs 1/5 th distance AD on the eighth line and posts a red flag.

Find the position of red flag

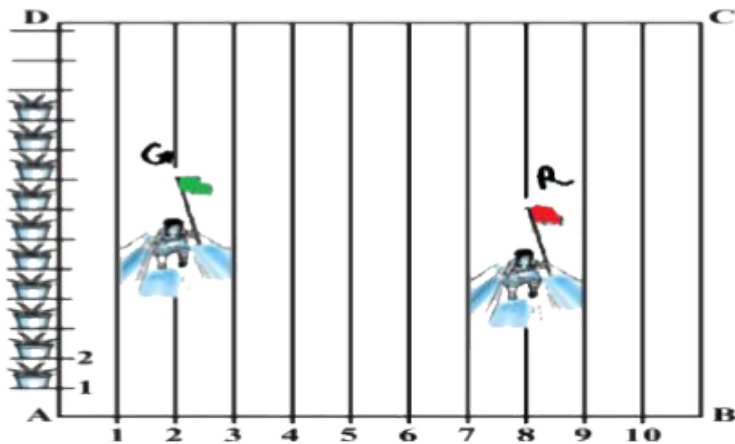A. (8,0)

B. (20,8)

C. (8,20)

D. (8,0.2)

Answer: C

▶ **Watch Video Solution**

3. In order to conduct Sports Day activities in your School, lines have been drawn with chalk powder at a distance of 1 m each, in a rectangular shaped ground ABCD, 100

flowerpots have been placed at a distance of 1 m from each other along AD, as shown in given figure below. Niharika runs 1/4 th the distance AD on the 2nd line and posts a green flag. Preet runs 1/5 th distance AD on the eighth line and posts a red flag.

What is the distance between both the flags?

A. $\sqrt{41}$

B. $\sqrt{11}$

C. $\sqrt{61}$

D. $\sqrt{51}$

Answer: C

▶ **Watch Video Solution**

4. In order to conduct Sports Day activities in your School, lines have been drawn with chalk powder at a distance of 1 m each, in a rectangular shaped ground ABCD, 100

flowerpots have been placed at a distance of 1 m from each other along AD, as shown in given figure below. Niharika runs 1/4 th the distance AD on the 2nd line and posts a green flag. Preet runs 1/5 th distance AD on the eighth line and posts a red flag.

If Rashmi has to post a blue flag exactly halfway between the line segment joining the two flags, where should she post her flag?

A. $(5, 22.5)$

B. $(10, 22)$

C. $(2, 8.5)$

D. $(2.5, 20)$

Answer: A

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5. In order to conduct Sports Day activities in your School, lines have been drawn with chalk powder at a distance of 1 m each, in a

rectangular shaped ground ABCD, 100 flowerpots have been placed at a distance of 1 m from each other along AD, as shown in given figure below. Niharika runs 1/4 th the distance AD on the 2nd line and posts a green flag. Preet runs 1/5 th distance AD on the eighth line and posts a red flag.
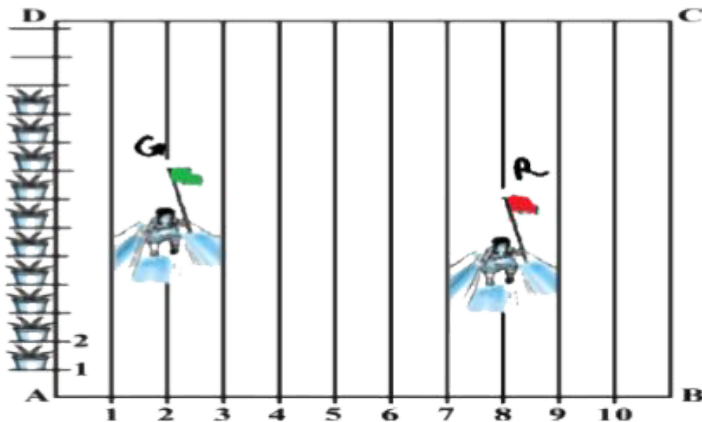
If Joy has to post a flag at one-fourth distance from green flag ,in the line segment joining

the green and red flags, then where should he post his flag?

A. $(3.5, 24)$

B. $(0.5, 12.5)$

C. $(2.25, 8.5)$

D. $(25, 20)$

Answer: A

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Coordinate Geometry Case Study 2

1. The class X students school in krishnagar have been allotted a rectangular plot of land for their gardening activity. Saplings of Gulmohar are planted on the boundary at a distance of 1 m from each other. There is triangular grassy lawn in the plot as shown in the figure. The students are to sow seeds of flowering plants on the remaining area of the plot.
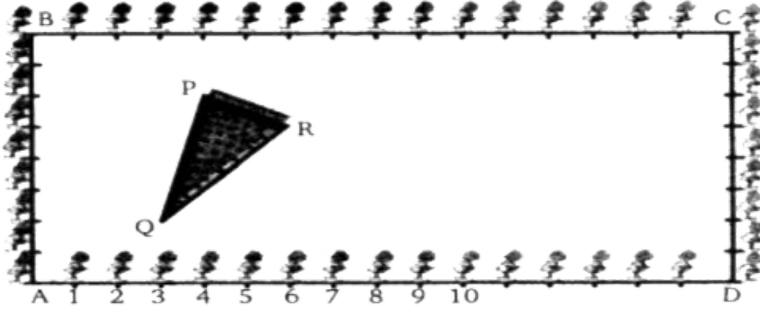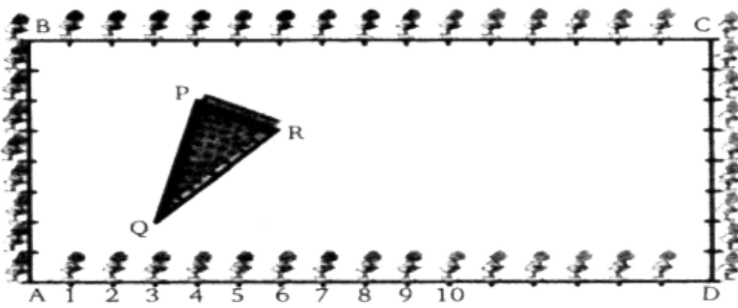
Taking A as origin, find the coordinates of P

A. (4,6)

B. (6,4)

C. (0,6)

D. (4,0)

Answer: A

2. The class X students school in krishnagar have been allotted a rectangular plot of land for their gardening activity. Saplings of Gulmohar are planted on the boundary at a distance of 1 m from each other. There is triangular grassy lawn in the plot as shown in the figure. The students are to sow seeds of flowering plants on the remaining area of the plot.
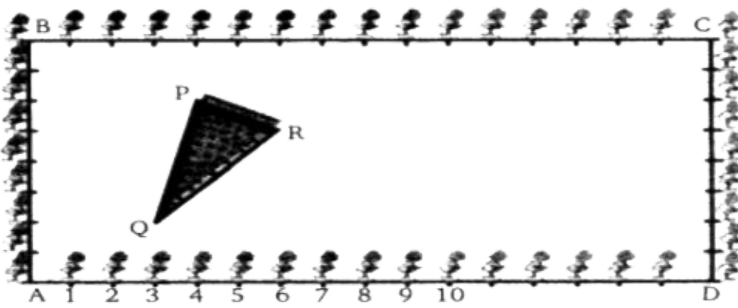
What will be the coordinates of R, if C is the origin?

A. (8,6)

B. (3,10)

C. (10,3)

D. (0,6)

Answer: C

3. The class X students school in krishnagar have been allotted a rectangular plot of land for their gardening activity. Saplings of Gulmohar are planted on the boundary at a distance of 1 m from each other. There is triangular grassy lawn in the plot as shown in the figure. The students are to sow seeds of flowering plants on the remaining area of the plot.

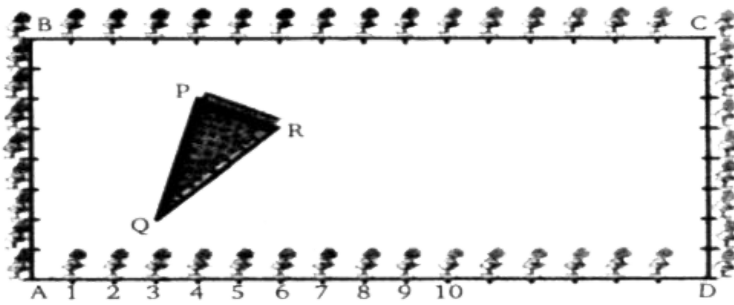What will be the coordinates of Q, if C is the origin?

A. (6,13)

B. (-6,13)

C. (-13,6)

D. (13,6)

Answer: D

4. The class X students school in krishnagar have been allotted a rectangular plot of land for their gardening activity. Saplings of Gulmohar are planted on the boundary at a distance of 1 m from each other. There is triangular grassy lawn in the plot as shown in the figure. The students are to sow seeds of flowering plants on the remaining area of the plot.

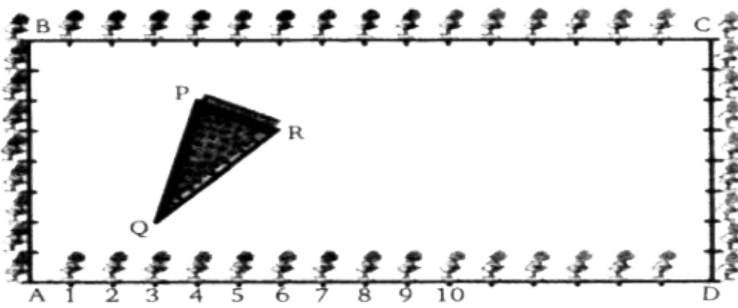Calculate the area of the triangles if A is the origin

A. 4.5

B. 6

C. 8

D. 6.25

Answer: A

5. The class X students school in krishnagar have been allotted a rectangular plot of land for their gardening activity. Saplings of Gulmohar are planted on the boundary at a distance of 1 m from each other. There is triangular grassy lawn in the plot as shown in the figure. The students are to sow seeds of flowering plants on the remaining area of the plot.

Calculate the area of the triangles if C is the origin

A. 8

B. 5

C. 6.25

D. 4.5

Answer: D

Circles Case Study 1

1. A Ferris wheel (or a big wheel in the United Kingdom) is an amusement ride consisting of a rotating upright wheel with multiple passenger-carrying components (commonly referred to as passenger cars, cabins, tubs, capsules, gondolas, or pods) attached to the rim in such a way that as the wheel turns, they are kept upright, usually by gravity.

After taking a ride in Ferris wheel, Aarti came out from the crowd and was observing her friends who were enjoying the ride . She was curious about the different angles and measures that the wheel will form. She forms the figure as given below.
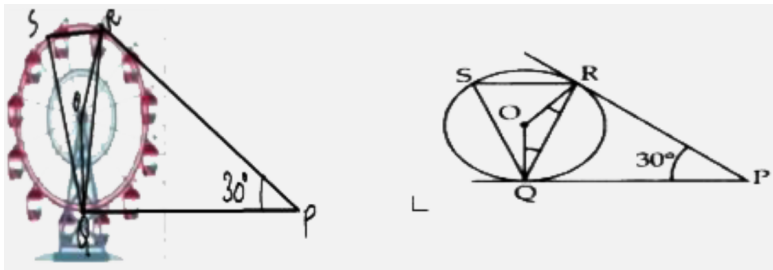
In the given figure find $\angle RPQ$

A. 60
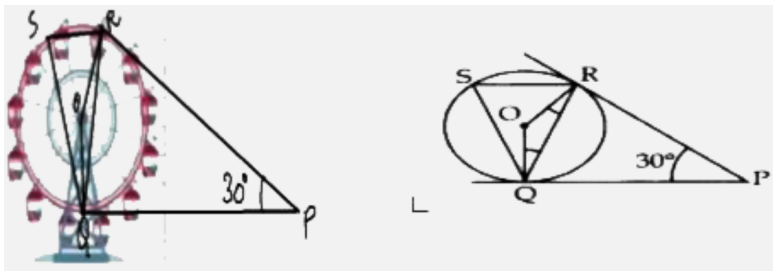
B. 100

C. 150

D. 90

Answer: C

▶ **Watch Video Solution**

2. A Ferris wheel (or a big wheel in the United Kingdom) is an amusement ride consisting of a rotating upright wheel with multiple passenger-carrying components (commonly referred to as passenger cars, cabins, tubs,

capsules, gondolas, or pods) attached to the rim in such a way that as the wheel turns, they are kept upright, usually by gravity.

After taking a ride in Ferris wheel, Aarti came out from the crowd and was observing her friends who were enjoying the ride . She was curious about the different angles and measures that the wheel will form. She forms the figure as given below.

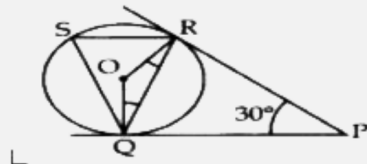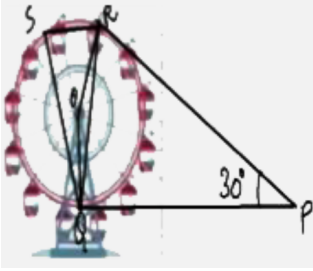Find $\angle RQP$

A. 75

B. 60

C. 30

D. 90

Answer: A

▶ **Watch Video Solution**

3. A Ferris wheel (or a big wheel in the United

Kingdom) is an amusement ride consisting of

a rotating upright wheel with multiple

passenger-carrying components (commonly referred to as passenger cars, cabins, tubs, capsules, gondolas, or pods) attached to the rim in such a way that as the wheel turns, they are kept upright, usually by gravity.

After taking a ride in Ferris wheel, Aarti came out from the crowd and was observing her friends who were enjoying the ride . She was curious about the different angles and measures that the wheel will form. She forms the figure as given below.

Find $\angle RSQ$.

A. 60

B. 75

C. 100

D. 30

Answer: B

Watch Video Solution

4. A Ferris wheel (or a big wheel in the United Kingdom) is an amusement ride consisting of a rotating upright wheel with multiple passenger-carrying components (commonly referred to as passenger cars, cabins, tubs, capsules, gondolas, or pods) attached to the rim in such a way that as the wheel turns, they are kept upright, usually by gravity.

After taking a ride in Ferris wheel, Aarti came out from the crowd and was observing her friends who were enjoying the ride . She was curious about the different angles and

measures that the wheel will form. She forms

the figure as given below.
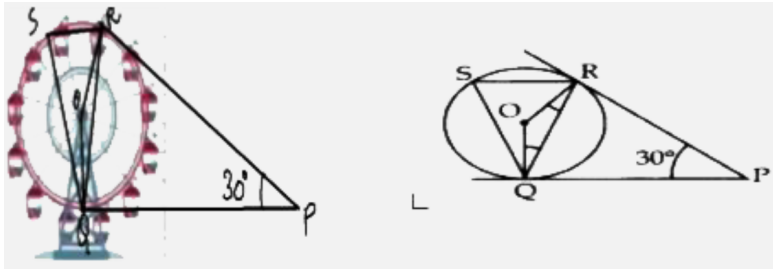
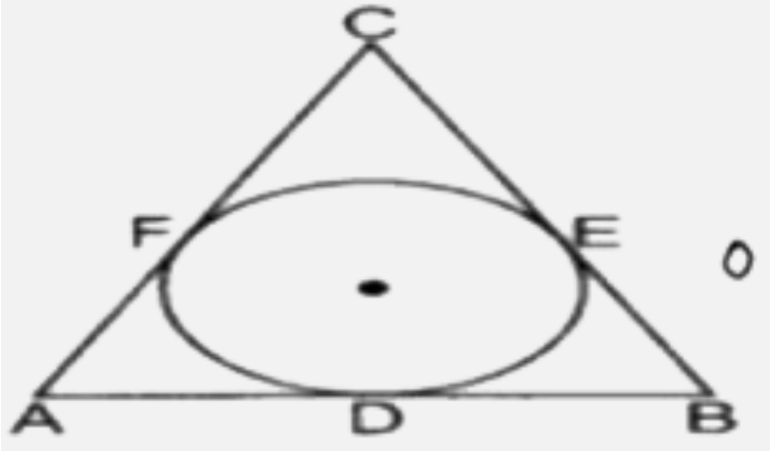

Find $\angle ORP$

A. 90

B. 70

C. 100

D. 60

Answer: A

Circles Case Study 2

1. Varun has been selected by his School to design logo for Sports Day T-shirts for students and staff . The logo design is as given in the figure and he is working on the

fonts and different colours according to the theme. In given figure, a circle with centre O is inscribed in a △ABC, such that it touches the sides AB, BC and CA at points D, E and F respectively. The lengths of sides AB, BC and CA are 12 cm, 8 cm and 10 cm respectively.

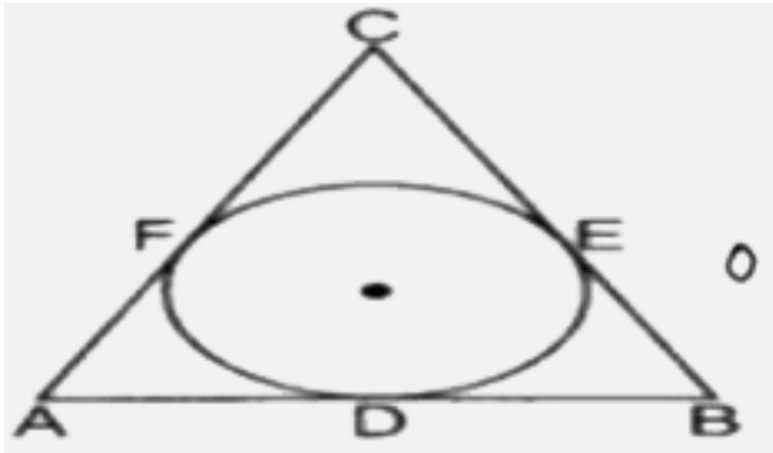Find the length of AD.

A. 7

B. 8

C. 5

D. 9

Answer: A

2. Varun has been selected by his School to design logo for Sports Day T-shirts for students and staff . The logo design is as given in the figure and he is working on the

fonts and different colours according to the theme. In given figure, a circle with centre O is

inscribed in a △ABC, such that it touches the sides AB, BC and CA at points D, E and F respectively. The lengths of sides AB, BC and CA are 12 cm, 8 cm and 10 cm respectively.

Find the lenght of BE .

A. 8
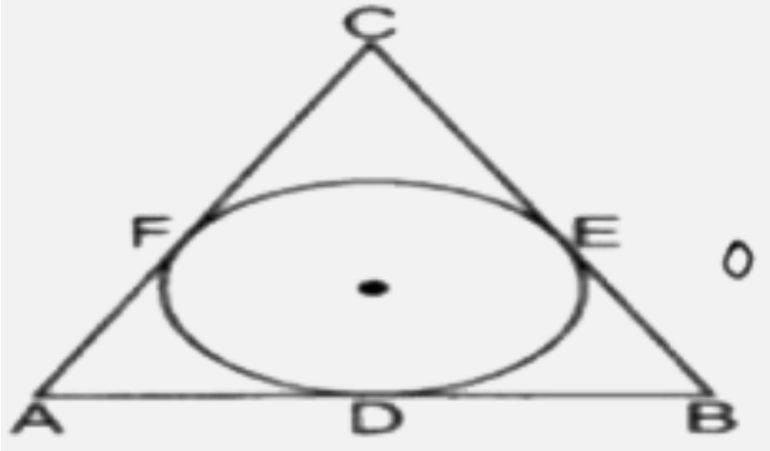
B. 5

C. 2

D. 9

Answer: B

> ▶ **Watch Video Solution**

3. Varun has been selected by his School to design logo for Sports Day T-shirts for students and staff . The logo design is as given in the figure and he is working on the

fonts and different colours according to the theme. In given figure, a circle with centre O is inscribed in a △ABC, such that it touches the sides AB, BC and CA at points D, E and F respectively. The lengths of sides AB, BC and CA are 12 cm, 8 cm and 10 cm respectively.

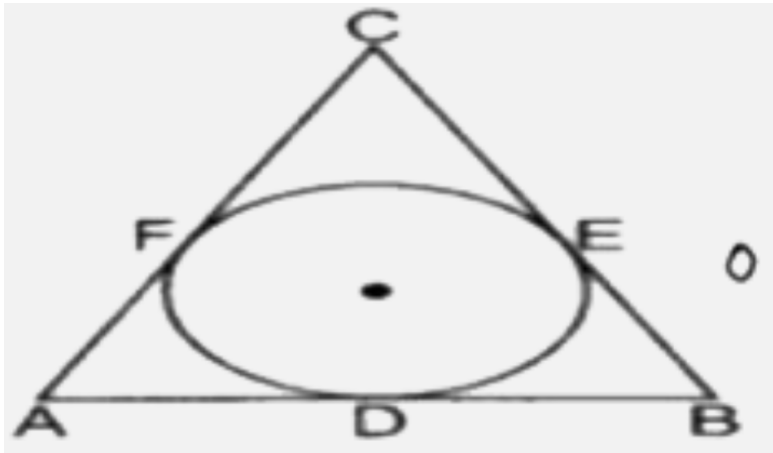Find the lenght of CF.

A. 9

B. 5

C. 2

D. 3

Answer: D

4. Varun has been selected by his School to design logo for Sports Day T-shirts for students and staff . The logo design is as given in the figure and he is working on the

fonts and different colours according to the theme. In given figure, a circle with centre O is

inscribed in a $\triangle ABC$, such that it touches the sides AB, BC and CA at points D, E and F respectively. The lengths of sides AB, BC and CA are 12 cm, 8 cm and 10 cm respectively.

if radius of the circle is 4 cm , Find the area of $\triangle AOB$.

A. 20

B. 36

C. 24

D. 48

Answer: C

▶ **Watch Video Solution**

5. Varun has been selected by his School to design logo for Sports Day T-shirts for students and staff . The logo design is as given in the figure and he is working on the

fonts and different colours according to the theme. In given figure, a circle with centre O is inscribed in a △ABC, such that it touches the sides AB, BC and CA at points D, E and F respectively. The lengths of sides AB, BC and CA are 12 cm, 8 cm and 10 cm respectively.
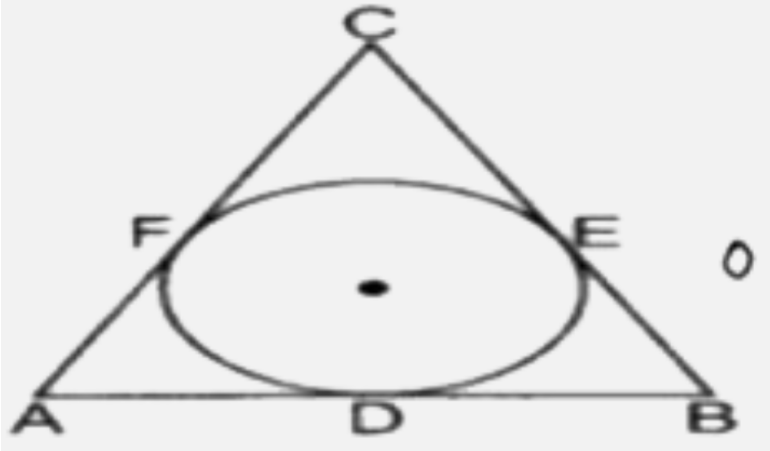
Find area of $\triangle ABC$.

A. 50

B. 60

C. 100

D. 90

Answer: B

Some Application Of Trigonometry Case Study 1

1. A group of students of class X visited India Gate on an education trip. The teacher and students had interest in history as well. The teacher narrated that India Gate, official name Delhi Memorial, originally called All-India War Memorial, monumental sandstone arch in New Delhi, dedicated to the troops of British India who died in wars fought between 1914 and

1919.The teacher also said that India Gate, which is located at the eastern end of the Rajpath (formerly called the Kingsway), is about 138 feet (42 metres) in height.

What is the angle of elevation if they are standing at a distance of 42m away from the monument?

A. $30°$

B. $45°$

C. $60°$

D. $0°$

Answer: B

▶ **Watch Video Solution**

2. A group of students of class X visited India Gate on an education trip. The teacher and students had interest in history as well. The teacher narrated that India Gate, official name Delhi Memorial, originally called All-India War

Memorial, monumental sandstone arch in New Delhi, dedicated to the troops of British India who died in wars fought between 1914 and 1919.The teacher also said that India Gate, which is located at the eastern end of the Rajpath (formerly called the Kingsway), is about 138 feet (42 metres) in height.

They want to see the tower at an angle of 60 . So, they want to know the distance where they should stand and hence find the distance.

A. 25.24 m

B. 20.12 m

C. 42 m

D. 24.64 m

Answer: A

▶ **Watch Video Solution**

3. A group of students of class X visited India Gate on an education trip. The teacher and students had interest in history as well. The

teacher narrated that India Gate, official name Delhi Memorial, originally called All-India War Memorial, monumental sandstone arch in New Delhi, dedicated to the troops of British India who died in wars fought between 1914 and 1919.The teacher also said that India Gate, which is located at the eastern end of the Rajpath (formerly called the Kingsway), is about 138 feet (42 metres) in height.

If the altitude of the Sun is at 60 , then the

height of the vertical tower that will cast a shadow of length 20 m is

A. $2\sqrt{3}m$

B. $\dfrac{20}{\sqrt{2}}m$

C. $\dfrac{15}{\sqrt{2}}m$

D. $15\sqrt{3}m$

Answer: A

4. A group of students of class X visited India Gate on an education trip. The teacher and students had interest in history as well. The teacher narrated that India Gate, official name Delhi Memorial, originally called All-India War Memorial, monumental sandstone arch in New Delhi, dedicated to the troops of British India who died in wars fought between 1914 and 1919.The teacher also said that India Gate, which is located at the eastern end of the Rajpath (formerly called the Kingsway), is about 138 feet (42 metres) in height.

The ratio of the length of a rod and its shadow

is 1:1 . The angle of elevation of the Sun is

A. $30°$

B. $45°$

C. $60°$

D. $90°$

Answer: B

▶ Watch Video Solution

5. A group of students of class X visited India Gate on an education trip. The teacher and students had interest in history as well. The teacher narrated that India Gate, official name Delhi Memorial, originally called All-India War Memorial, monumental sandstone arch in New Delhi, dedicated to the troops of British India who died in wars fought between 1914 and 1919.The teacher also said that India Gate, which is located at the eastern end of the Rajpath (formerly called the Kingsway), is

about 138 feet (42 metres) in height.

The angle formed by the line of sight with the

horizontal when the object viewd is below the

horizontal level is

A. corresponding angle

B. angle of elevation

C. angle of depression

D. complete angle

Answer: A
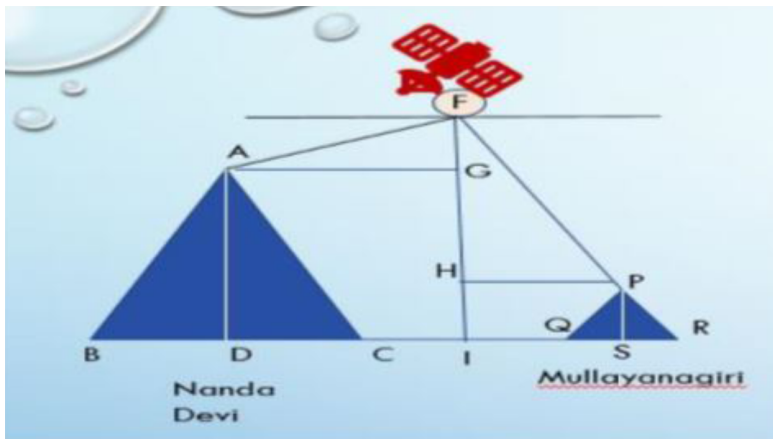
Some Application Of Trigonometry Case Study 2

1. A Satellite flying at height h is watching the top of the two tallest mountains in Uttarakhand and Karnataka ,them being Nanda Devi(height 7,816m) and Mullayanagiri (height 1,930 m). The angles of depression from the satellite , to the top of Nanda Devi

and Mullayanagiri are $30°$ and $60°$ respectively.

If the distance between the peaks of two mountains is 1937 km , and the satellite is vertically above the midpoint of the distance between the two mountains.

The distance of the satellite from the top of Nanda Devi is

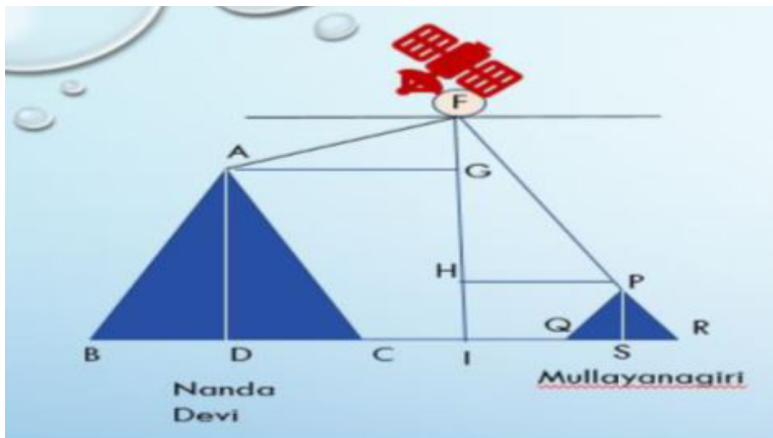A. 1139.4 km

B. 577.52 km

C. 1937 km

D. 1025.36 km

Answer: A

▶ **Watch Video Solution**

2. A Satellite flying at height h is watching the

top of the two tallest mountains in

Uttarakhand and Karnataka ,them being

Nanda Devi(height 7,816m) and Mullayanagiri

(height 1,930 m). The angles of depression from the satellite , to the top of Nanda Devi and Mullayanagiri are $30°$ and $60°$ respectively. If the distance between the peaks of two mountains is 1937 km , and the satellite is vertically above the midpoint of the distance between the two mountains.

B
D
Nanda
Devi
C
I
A
F
G
H
P
Q
R
S
Mullayanagiri

The distance of the satellite from the top of Mullayanagiri is

A. 1139.4 km

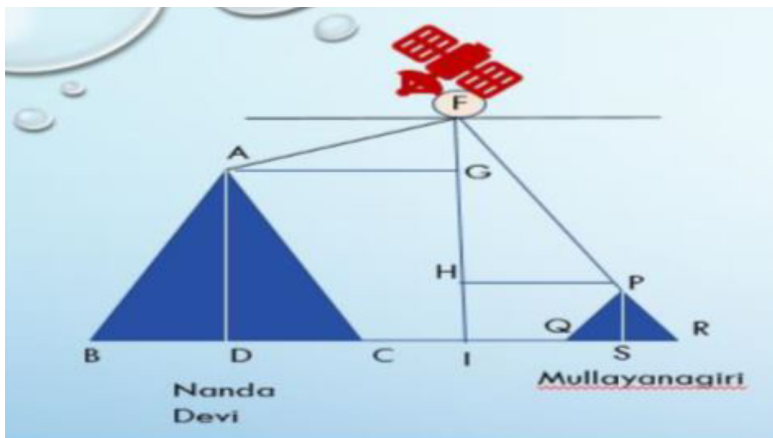B. 577.52 km

C. 1937 km

D. 1025.36 km

Answer: C

▶ **Watch Video Solution**

3. A Satellite flying at height h is watching the

top of the two tallest mountains in

Uttarakhand and Karnataka ,them being

Nanda Devi(height 7,816m) and Mullayanagiri

(height 1,930 m). The angles of depression

from the satellite , to the top of Nanda Devi

and Mullayanagiri are $30°$ and $60°$ respectively.

If the distance between the peaks of two

mountains is 1937 km , and the satellite is

vertically above the midpoint of the distance

between the two mountains.

The distance of the satellite from the ground is

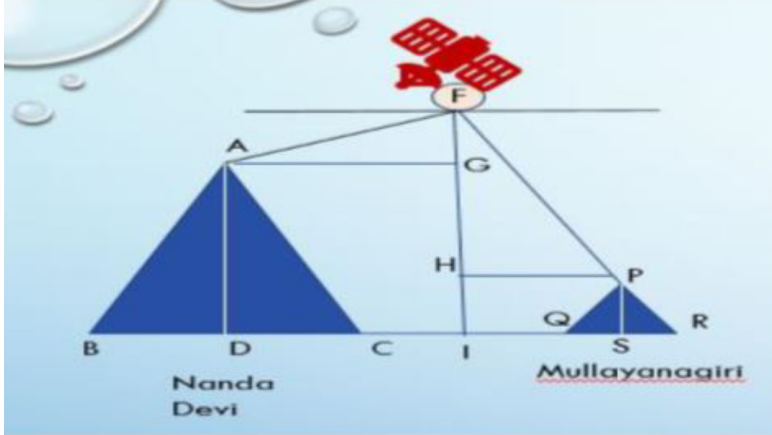A. 1139.4 km

B. 577.52 km

C. 1937 km

D. 1025.36 km

Answer: B

▶ **Watch Video Solution**

4. A Satellite flying at height h is watching the top of the two tallest mountains in Uttarakhand and Karnataka ,them being Nanda Devi(height 7,816m) and Mullayanagiri (height 1,930 m). The angles of depression from the satellite , to the top of Nanda Devi and Mullayanagiri are $30°$ and $60°$ respectively. If the distance between the peaks of two mountains is 1937 km , and the satellite is vertically above the midpoint of the distance between the two mountains.

What is the angle of elevation if a man is standing at a distance of 7816m from Nanda Devi?

A. $30°$

B. $45°$

C. $60°$

D. $0°$

Answer: B

5. A Satellite flying at height h is watching the top of the two tallest mountains in Uttarakhand and Karnataka ,them being Nanda Devi(height 7,816m) and Mullayanagiri (height 1,930 m). The angles of depression from the satellite , to the top of Nanda Devi and Mullayanagiri are $30°$ and $60°$ respectively. If the distance between the peaks of two

mountains is 1937 km , and the satellite is

vertically above the midpoint of the distance

between the two mountains.

If a mile stone very far away from, makes 45 to

the top of Mullanyangiri montain .So, find the

distance of this mile stone form the mountain.

A. 1118.327 km

B. 566.976 km

C. 1937 km

D. 1025.36 km

Answer: C

▶ **Watch Video Solution**
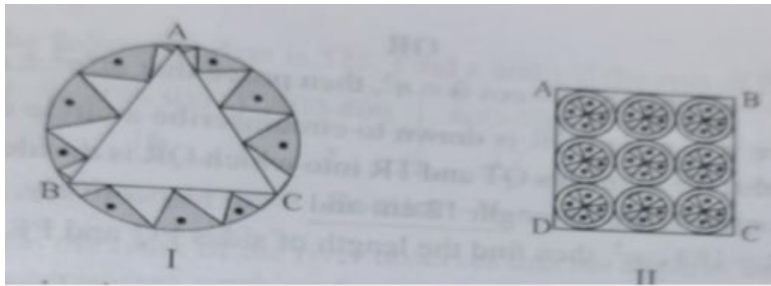
Areas Related To Circles Case Study 3

1. Pookalam is the flower bed or flower pattern designed during Onam in Kerala. It is similar as Rangoli in North India and Kolam in Tamil

Nadu.

During the festival of Onam , your school is planning to conduct a Pookalam competition. Your friend who is a partner in competition , suggests two designs given below.

Observe these carefully.

Design I: This design is made with a circle of radius 32cm leaving equilateral triangle ABC in the middle as shown in the given figure.

Design II: This Pookalam is made with 9

circular design each of radius 7cm.

Refer Design I :

The side of equilateral triangle is

A. $12\sqrt{3}cm$

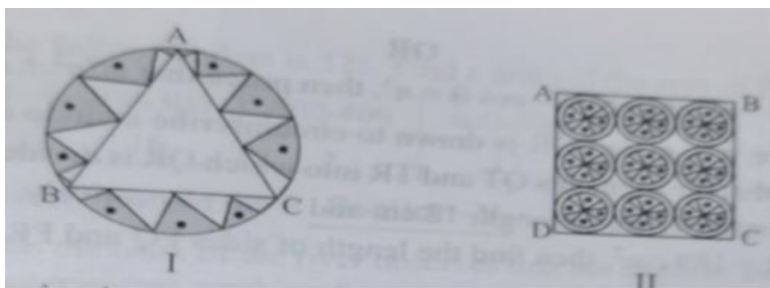B. $32\sqrt{3}cm$

C. $48cm$

D. $64cm$

Answer: B

2. Pookalam is the flower bed or flower pattern designed during Onam in Kerala. It is similar as Rangoli in North India and Kolam in Tamil Nadu.

During the festival of Onam , your school is planning to conduct a Pookalam competition. Your friend who is a partner in competition , suggests two designs given below.

Observe these carefully.

Design I: This design is made with a circle of

radius 32cm leaving equilateral triangle ABC in the middle as shown in the given figure.

Design II: This Pookalam is made with 9 circular design each of radius 7cm.

Refer Design I :

The altitude of the equilateral triangle is

    A. 8 cm

    B. 12 cm

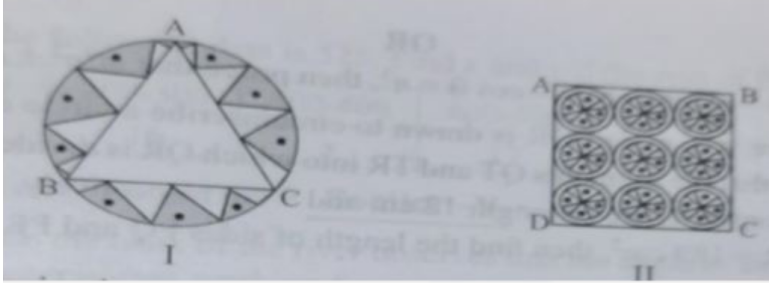   C. 48 cm

    D. 52 cm

Answer: C

3. Pookalam is the flower bed or flower pattern designed during Onam in Kerala. It is similar as Rangoli in North India and Kolam in Tamil Nadu.

During the festival of Onam , your school is planning to conduct a Pookalam competition. Your friend who is a partner in competition , suggests two designs given below.

Observe these carefully.

Design I: This design is made with a circle of radius 32cm leaving equilateral triangle ABC in the middle as shown in the given figure.

Design II: This Pookalam is made with 9 circular design each of radius 7cm.

Refer Design II :

The area of square is

A. $1264cm^2$

B. $1764cm^2$

C. $1830 cm^2$

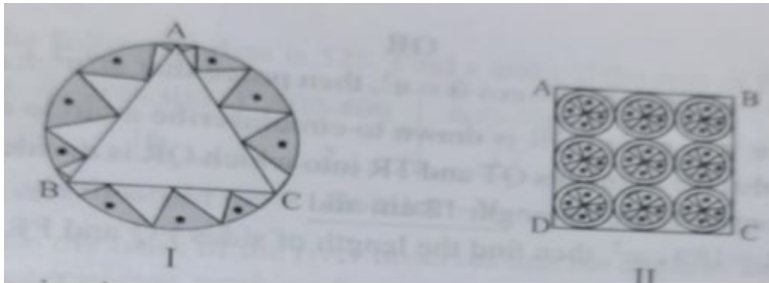D. $1944 cm^2$

Answer: B

▶ **Watch Video Solution**

4. Pookalam is the flower bed or flower pattern designed during Onam in Kerala. It is similar as Rangoli in North India and Kolam in Tamil Nadu.

During the festival of Onam , your school is

planning to conduct a Pookalam competition.

Your friend who is a partner in competition ,

suggests two designs given below.

Observe these carefully.

Design I: This design is made with a circle of

radius 32cm leaving equilateral triangle ABC in

the middle as shown in the given figure.

Design II: This Pookalam is made with 9

circular design each of radius 7cm.

Refer Design II :

Area of each circular design is

A. $124cm^2$

B. $132cm^2$

C. $144cm^2$

D. $154cm^2$

Answer: D

▶ **Watch Video Solution**

5. Pookalam is the flower bed or flower pattern designed during Onam in Kerala. It is similar as Rangoli in North India and Kolam in Tamil Nadu.

During the festival of Onam , your school is planning to conduct a Pookalam competition. Your friend who is a partner in competition , suggests two designs given below.

Observe these carefully.
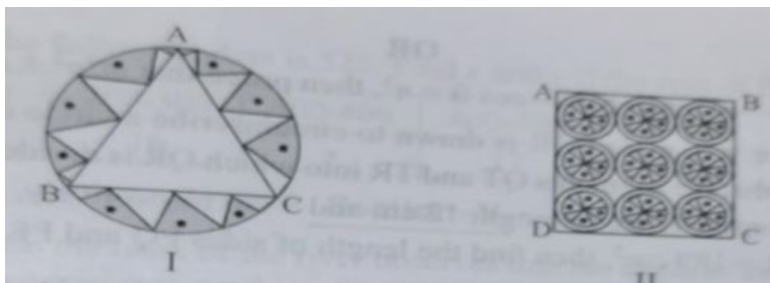
Design I: This design is made with a circle of radius 32cm leaving equilateral triangle ABC in the middle as shown in the given figure.

Design II: This Pookalam is made with 9 circular design each of radius 7cm.

Refer Design II :

Area of the remaining portion of the square ABCD is
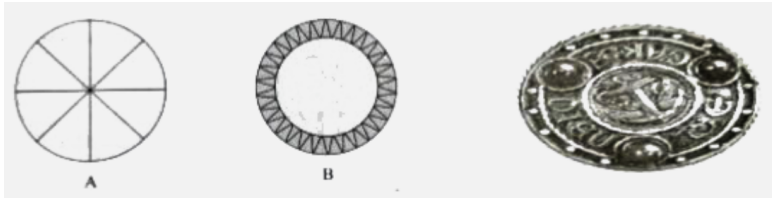
A. $378cm^2$

B. $260cm^2$

C. $340cm^2$

D. $278cm^2$

Answer: A

▶ **Watch Video Solution**

A Brooch Case Study 4

1. A brooch is a small piece of jewellery which has a pin at the back so it can be fastened on a dress, blouse or coat.Designs of some brooch are shown below. Observe them

carefully.

Design A: Brooch A is made with silver wire in the form of a circle with diameter 28mm. The wire used for making 4 diameters which divide the circle into 8 equal parts.

Design B: Brooch b is made two colours_ Gold and silver. Outer part is made with Gold. The circumference of silver part is 44mm and the gold part is 3mm wide everywhere.

Refer to Design A

The total length of silver wire required is
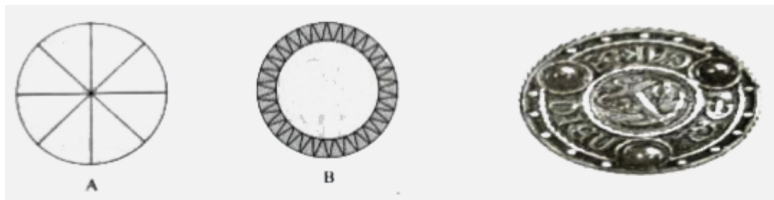
A. 180 mm

B. 200 mm

C. 250 mm

D. 280 mm

Answer: B

▶ **Watch Video Solution**

2. A brooch is a small piece of jewellery which has a pin at the back so it can be fastened on a dress, blouse or coat.Designs of some

brooch are shown below. Observe them carefully.

Design A: Brooch A is made with silver wire in the form of a circle with diameter 28mm. The wire used for making 4 diameters which divide the circle into 8 equal parts.

Design B: Brooch b is made two colours_ Gold and silver. Outer part is made with Gold. The circumference of silver part is 44mm and the gold part is 3mm wide everywhere.

Refer to Design A

The area of each sector of the brooch is
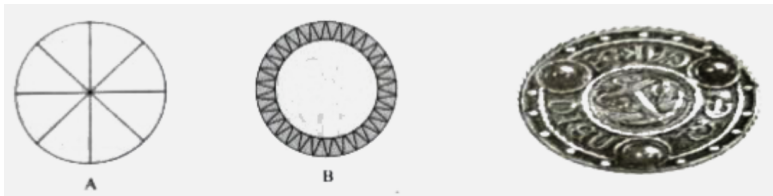
A. $44mm^2$

B. $52mm^2$

C. $77mm^2$

D. $68mm^2$

Answer: C

3. A brooch is a small piece of jewellery which has a pin at the back so it can be fastened on a dress, blouse or coat.Designs of some brooch are shown below. Observe them carefully.

Design A: Brooch A is made with silver wire in the form of a circle with diameter 28mm. The wire used for making 4 diameters which divide the circle into 8 equal parts.

Design B: Brooch b is made two colours_ Gold

and silver. Outer part is made with Gold. The circumference of silver part is 44mm and the gold part is 3mm wide everywhere.

Refer to Design B

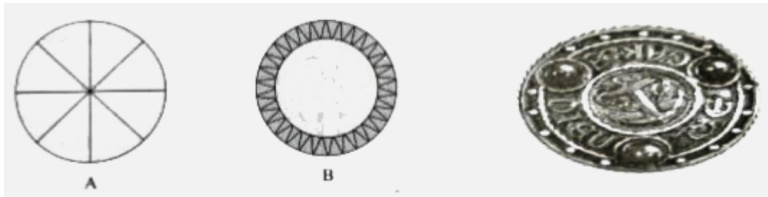The circumference of outer part (golden) is

A. $48.49mm$

B. $82.2mm$

C. $72.50mm$

D. $62.86mm$

Answer: D

4. A brooch is a small piece of jewellery which has a pin at the back so it can be fastened on a dress, blouse or coat.Designs of some brooch are shown below. Observe them carefully.

Design A: Brooch A is made with silver wire in the form of a circle with diameter 28mm. The wire used for making 4 diameters which divide

the circle into 8 equal parts.

Design B: Brooch b is made two colours_ Gold and silver. Outer part is made with Gold. The circumference of silver part is 44mm and the gold part is 3mm wide everywhere.

Refer to Design B

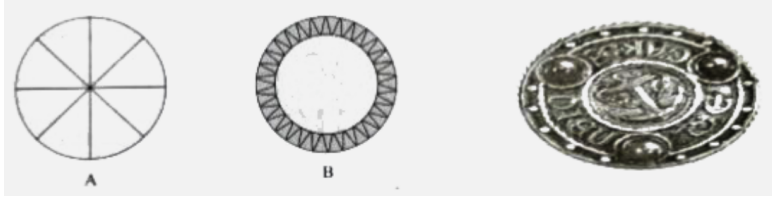The difference of areas of golden and silver parts is

A. 18π

B. 44π

C. 51π

D. 64π

Answer: C

> ▶ **Watch Video Solution**

5. A brooch is a small piece of jewellery which has a pin at the back so it can be fastened on a dress, blouse or coat.Designs of some brooch are shown below. Observe them carefully.

Design A: Brooch A is made with silver wire in the form of a circle with diameter 28mm. The wire used for making 4 diameters which divide the circle into 8 equal parts.

Design B: Brooch b is made two colours_ Gold and silver. Outer part is made with Gold. The circumference of silver part is 44mm and the gold part is 3mm wide everywhere.

Refer to Design B

A boy is playing with brooch B. He makes revolution with it along its edge. How many

complete revolutions must it take to cover 80π mm ?
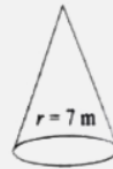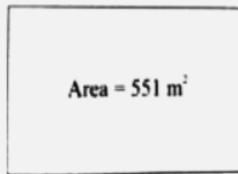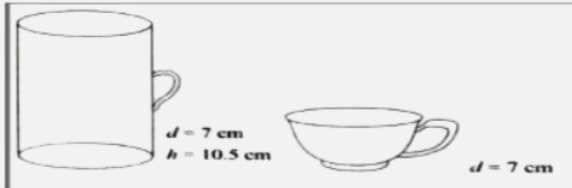
A. 2

B. 3

C. 4

D. 5

Answer: C

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Surface Areas And Volumes Case Study 1

1. Adventure camps are the perfect place for the children to practice decision making for themselves without parents and teachers guiding their every move. Some students of a school reached for adventure at Sakleshpur. At the camp, the waiters served some students with a welcome drink in a cylindrical glass and some students in a hemispherical cup whose dimensions are shown below. After that they went for a jungle trek. The jungle trek was enjoyable but tiring. As dusk fell, it was time to

take shelter. Each group of four students was given a canvas of area 551m2. Each group had to make a conical tent to accommodate all the four students. Assuming that all the stitching and wasting incurred while cutting, would amount to 1m2, the students put the tents. The radius of the tent is 7m.

d = 7 cm
h = 10.5 cm

d = 7 cm

Area = 551 m²

r = 7 m

The volume of cylindrical cup is
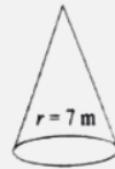
A. $295.75cm^3$

B. $7415.5cm^3$

C. $384.88cm^3$

D. $404.25cm^3$

Answer: D

2. Adventure camps are the perfect place for the children to practice decision making for themselves without parents and teachers guiding their every move. Some students of a school reached for adventure at Sakleshpur. At the camp, the waiters served some students with a welcome drink in a cylindrical glass and some students in a hemispherical cup whose

dimensions are shown below. After that they went for a jungle trek. The jungle trek was enjoyable but tiring. As dusk fell, it was time to take shelter. Each group of four students was given a canvas of area 551m2. Each group had to make a conical tent to accommodate all the four students. Assuming that all the stitching and wasting incurred while cutting, would amount to 1m2, the students put the tents. The radius of the tent is 7m.

d = 7 cm
h = 10.5 cm

d = 7 cm

Area = 551 m²

r = 7 m

The volume of hemispherical cup is

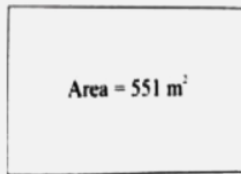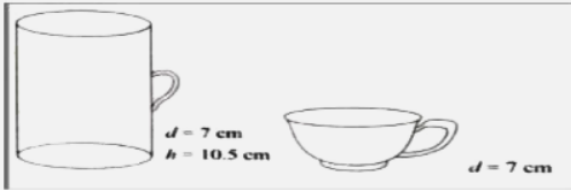A. $179.67 cm^3$

B. $89.83 cm^3$

C. $172.25 cm^3$

D. $210.60 cm^3$

Answer: B

3. Adventure camps are the perfect place for the children to practice decision making for themselves without parents and teachers guiding their every move. Some students of a school reached for adventure at Sakleshpur. At the camp, the waiters served some students with a welcome drink in a cylindrical glass and some students in a hemispherical cup whose

dimensions are shown below. After that they went for a jungle trek. The jungle trek was enjoyable but tiring. As dusk fell, it was time to take shelter. Each group of four students was given a canvas of area 551m2. Each group had to make a conical tent to accommodate all the four students. Assuming that all the stitching and wasting incurred while cutting, would amount to 1m2, the students put the tents. The radius of the tent is 7m.

d = 7 cm
h = 10.5 cm
d = 7 cm
Area = 551 m²
r = 7 m

Which container had more juice and by how much?

A. Hemispherical cup, $195cm^3$

B. Cylindrical glass, $207cm^3$

C. Hemispherical cup, $280.85cm^3$
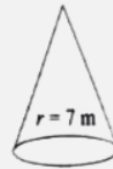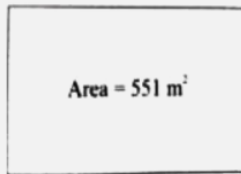
D. Cylindrical glass, $314.42 cm^3$

Answer: D

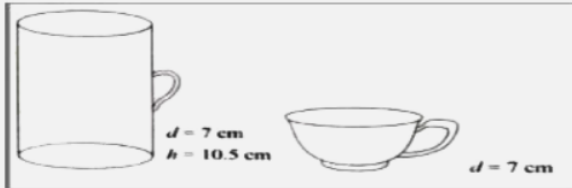▶ **Watch Video Solution**

4. Adventure camps are the perfect place for the children to practice decision making for themselves without parents and teachers guiding their every move. Some students of a school reached for adventure at Sakleshpur. At the camp, the waiters served some students

with a welcome drink in a cylindrical glass and some students in a hemispherical cup whose dimensions are shown below. After that they went for a jungle trek. The jungle trek was enjoyable but tiring. As dusk fell, it was time to take shelter. Each group of four students was given a canvas of area 551m2. Each group had to make a conical tent to accommodate all the four students. Assuming that all the stitching and wasting incurred while cutting, would amount to 1m2, the students put the tents. The radius of the tent is 7m.

d = 7 cm
h = 10.5 cm

d = 7 cm

Area = 551 m²

r = 7 m

The height of the conical tent prepared to accommodate four students is
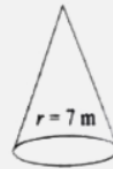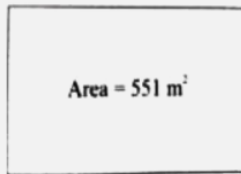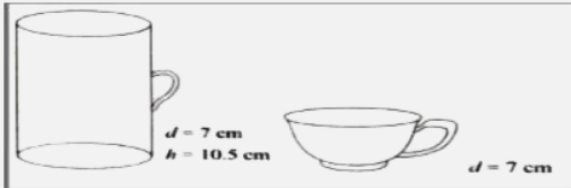
A. 18 m

B. 10 m

C. 24 m

D. 14 m

Answer: C

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5. Adventure camps are the perfect place for the children to practice decision making for themselves without parents and teachers guiding their every move. Some students of a school reached for adventure at Sakleshpur. At the camp, the waiters served some students

with a welcome drink in a cylindrical glass and some students in a hemispherical cup whose dimensions are shown below. After that they went for a jungle trek. The jungle trek was enjoyable but tiring. As dusk fell, it was time to take shelter. Each group of four students was given a canvas of area 551m2. Each group had to make a conical tent to accommodate all the four students. Assuming that all the stitching and wasting incurred while cutting, would amount to 1m2, the students put the tents. The radius of the tent is 7m.

d = 7 cm
h = 10.5 cm

d = 7 cm

Area = 551 m²

r = 7 m

How much space on the ground is occupied by each student in the conical tent.

A. $54m^2$

B. $38.5cm^2$

C. $86m^2$

D. $24m^2$

Answer: B

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Surface Areas And Volumes Case Study 2
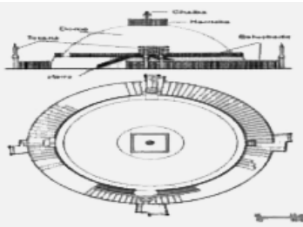
1.

The Great Stupa at Sanchi is one of the oldest stone structures in India, and an important monument of Indian Architecture. It was originally commissioned by the emperor Ashoka in the 3rd century BCE. Its nucleus was a simple hemispherical brick structure built over the relics of the Buddha. .It is a perfect

example of combination of solid figures. A big hemispherical dome with a cuboidal structure mounted on it. (Take $= \pi = \dfrac{22}{7}$)

Calculate the volume of the hemispherical dome if the height of the dome is 21 m –

A. 19404 cu. m

B. 2000 cu .m

C. 15000 cu. m

D. 19000 cu. m

Answer: A

2.

The Great Stupa at Sanchi is one of the oldest stone structures in India, and an important monument of Indian Architecture. It was originally commissioned by the emperor Ashoka in the 3rd century BCE. Its nucleus was

a simple hemispherical brick structure built over the relics of the Buddha. .It is a perfect example of combination of solid figures. A big hemispherical dome with a cuboidal structure mounted on it. (Take $= \pi = \frac{22}{7}$)

The formula to find the Volume of Sphere is-

A. $\frac{2}{3}\pi r^2$

B. $\frac{4}{3}\pi r^2$

C. $4\pi r^2$

D. $2\pi r^2$

Answer: B
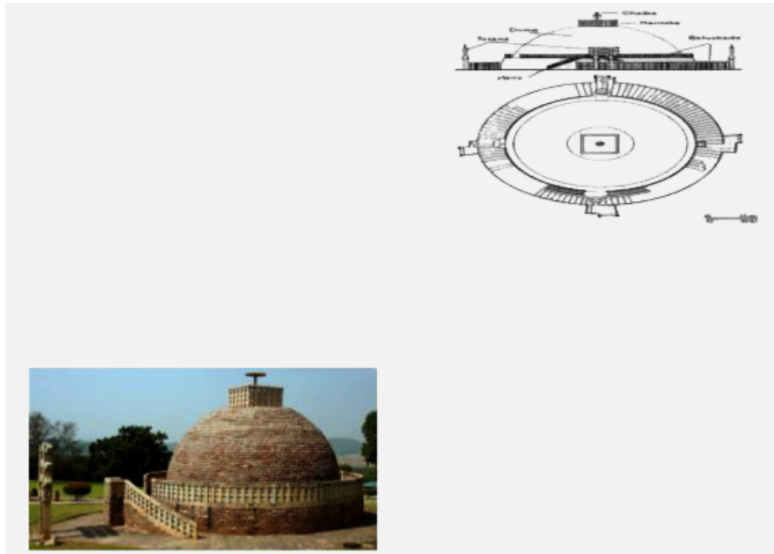
3.

The Great Stupa at Sanchi is one of the oldest stone structures in India, and an important monument of Indian Architecture. It was originally commissioned by the emperor Ashoka in the 3rd century BCE. Its nucleus was

a simple hemispherical brick structure built over the relics of the Buddha. .It is a perfect example of combination of solid figures. A big hemispherical dome with a cuboidal structure mounted on it. (Take $= \pi = \frac{22}{7}$)

The cloth require to cover the hemispherical dome if the radius of its base is 14m is

A. 1222 sq.m

B. 1232 sq.m

C. 1200 sq.m

D. 1400 sq.m

Answer: B
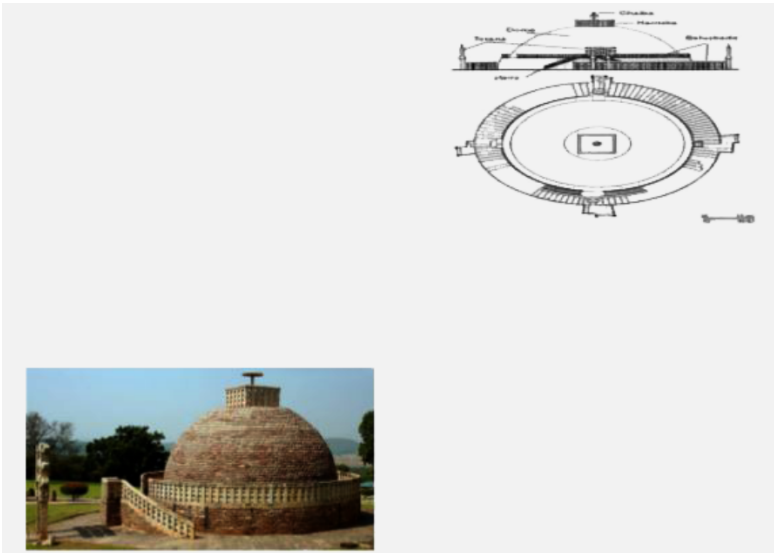
4.

The Great Stupa at Sanchi is one of the oldest stone structures in India, and an important monument of Indian Architecture. It was

originally commissioned by the emperor Ashoka in the 3rd century BCE. Its nucleus was a simple hemispherical brick structure built over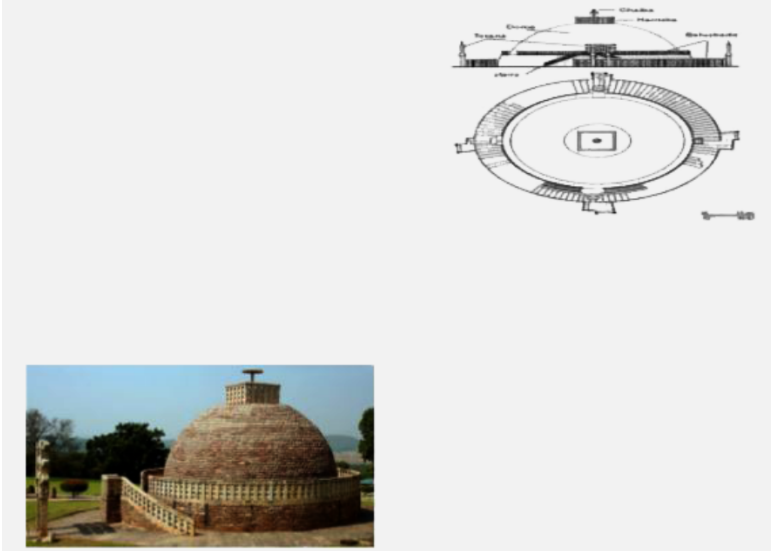 the relics of the Buddha. .It is a perfect example of combination of solid figures. A big hemispherical dome with a cuboidal structure mounted on it. (Take = $\pi = \dfrac{22}{7}$)

The total surface area of the combined figure i.e. hemispherical dome with radius 14m and cuboidal shaped top with dimensions 8m 6m 4m is

A. 1200 sq. m

B. 1232 sq. m

C. 1392 sq.m

D. 1932 sq. m

Answer: C
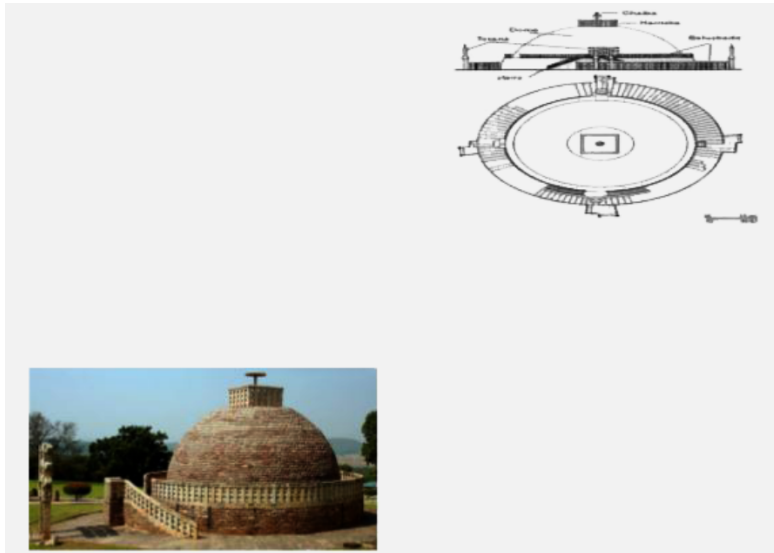
5.

The Great Stupa at Sanchi is one of the oldest stone structures in India, and an important monument of Indian Architecture. It was originally commissioned by the emperor Ashoka in the 3rd century BCE. Its nucleus was a simple hemispherical brick structure built over the relics of the Buddha. .It is a perfect

example of combination of solid figures. A big hemispherical dome with a cuboidal structure mounted on it. (Take = $\pi = \dfrac{22}{7}$)

The volume of the cuboidal shaped top is with dimensions mentioned in question 4.

A. $182.45m^3$

B. $282.\ 45m^3$

C. $292m^3$

D. $192m^3$

Answer: D

Surface Areas And Volumes Case Study 3

1. On a Sunday, your Parents took you to a fair. You could see lot of toys displayed,and you wanted them to buy a RUBIK's cube and strawberry ice-cream for you.Observe the figures and answer the questions-:

The length of the diagonal if each edge measures 6cm is

A. $3\sqrt{3}$

B. $3\sqrt{6}$

C. $\sqrt{12}$

D. $6\sqrt{3}$

Answer: D

▶ **Watch Video Solution**

2. On a Sunday, your Parents took you to a fair. You could see lot of toys displayed,and you wanted them to buy a RUBIK's cube and strawberry ice-cream for you.Observe the figures and answer the questions-:

Volume of the solid figure if the length of the edge is 7cm is-

A. $256cm^3$

B. $196 cm^3$

C. $343 cm^3$

D. $434 cm^3$

Answer: C

▶ **Watch Video Solution**

3. On a Sunday, your Parents took you to a fair. You could see lot of toys displayed,and you wanted them to buy a RUBIK's cube and strawberry ice-cream for you.Observe the

figures and answer the questions-:

What is the curved surface area of hemisphere (ice cream) if the base radius is 7cm?

A. $309cm^2$

B. $308cm^2$

C. $803cm^2$

D. $903cm^2$

Answer: B

4. On a Sunday, your Parents took you to a fair. You could see lot of toys displayed,and you wanted them to buy a RUBIK's cube and strawberry ice-cream for you.Observe the figures and answer the questions-:

Slant height of a cone if the radius is 7cm and the height is 24 cm___.

A. 26 cm

B. 25 cm

C. 52 cm

D. 62 cm

Answer: B

▶ **Watch Video Solution**

5. On a Sunday, your Parents took you to a fair. You could see lot of toys displayed,and you wanted them to buy a RUBIK's cube and

strawberry ice-cream for you.Observe the figures and answer the questions-:

The total surface area of cone with hemispherical ice cream is

A. $858cm^2$

B. $885cm^2$

C. $588cm^2$

D. $855cm^2$

Answer: A

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Statistics Case Study 1

1. COVID-19 Pandemic

The COVID-19 pandemic, also known as coronavirus pandemic, is an ongoing pandemic of coronavirus disease caused by the transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) among

humans.

The following tables shows the age distribution of case admitted during a day in two different hospitals .

Table 1

Age (in years)	5-15	15-25	25-35	35-45	45-55	55-65
No. of cases	6	11	21	23	14	5

Table 2

Age (in years)	5-15	15-25	25-35	35-45	45-55	55-65
No. of cases	8	16	10	42	24	12

Refer to table 1.

The average age for which maximum cases occurred is

A. 32.24

B. 34.36

C. 36.82

D. 42.24

Answer: C

▶ **Watch Video Solution**

2. COVID-19 Pandemic

The COVID-19 pandemic, also known as

coronavirus pandemic, is an ongoing

pandemic of coronavirus disease caused by the transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) among humans.

The following tables shows the age distribution of case admitted during a day in two different hospitals .

Table 1

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No. of cases	6	11	21	23	14	5

Table 2

Age (in years)	5-15	15-25	25-35	35-45	45-55	55-65
No. of cases	8	16	10	42	24	12

Refer to table 1.

The upper limit of modal class is

A. 15

B. 25

C. 35

D. 45

Answer: D

3. COVID-19 Pandemic

The COVID-19 pandemic, also known as coronavirus pandemic, is an ongoing pandemic of coronavirus disease caused by the transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) among humans.

The following tables shows the age distribution of case admitted during a day in

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No. of cases	6	11	21	23	14	5

Table 2

Age (in years)	5-15	15-25	25-35	35-45	45-55	55-65
No. of cases	8	16	10	42	24	12

Refer to table 1.

The mean of the given data is

A. 26.2

B. 32.4

C. 33.5

D. 35.4

Answer: D

4. COVID-19 Pandemic

The COVID-19 pandemic, also known as coronavirus pandemic, is an ongoing pandemic of coronavirus disease caused by the transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) among humans.

The following tables shows the age distribution of case admitted during a day in two different hospitals .

Table 1

Age (in years)	5-15	15-25	25-35	35-45	45-55	55-65
No. of cases	6	11	21	23	14	5

Table 2

Age (in years)	5-15	15-25	25-35	35-45	45-55	55-65
No. of cases	8	16	10	42	24	12

Refer to table 2.

The mode of the given data is

A. 41.4

B. 48.2

C. 55.3

D. 64.6

Answer: A

5. COVID-19 Pandemic

The COVID-19 pandemic, also known as coronavirus pandemic, is an ongoing pandemic of coronavirus disease caused by the transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) among humans.

COVID-19

The following tables shows the age distribution of case admitted during a day in two different hospitals .

Table 1

Age (in years)	5-15	15-25	25-35	35-45	45-55	55-65
No. of cases	6	11	21	23	14	5

Table 2

Age (in years)	5-15	15-25	25-35	35-45	45-55	55-65
No. of cases	8	16	10	42	24	12

Refer to table 2.

The median of the given data is

A. 32.7

B. 40.2

C. 42.3

D. 48.6

Answer: B

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Electric Energy Consumption Case Study 2

1. Electricity energy consumption is the form of energy consumption that uses electric

energy. Global electricity consumption continues to increase faster than world population, leading to an increase in the average amount of electricity consumed per person (per capita electricity consumption).

Tariff	: LT - Residential	Bill Number	: 384756
Type of Supply	: Single Phase	Connected Load	: 3 kW
Meter Reading Date	: 31-11-13	Meter Reading	: 65789
Previous Reading Date	: 31-10-13	Previous Meter Reading	: 65500
		Units Consumed	: 289

A survey is conducted for 56 families of a Colony A. The following tables gives the weekly consumption of electricity of these families.

Weekly consumption (in units)	0-10	10-20	20-30	30-40	40-50	50-60
No. of families	16	12	18	6	4	0

The similar survey is conducted for 80 families of Colony B and the data is recorded as below:

Weekly consumption (in units)	0-10	10-20	20-30	30-40	40-50	50-60
No. of families	0	5	10	20	40	5

Refer to data received from Colony A

The median weekly consumption is

A. 12 units

B. 16 units

C. 20 units

D. None of these

Answer: C

▶ Watch Video Solution

2. Electricity energy consumption is the form of energy consumption that uses electric energy. Global electricity consumption continues to increase faster than world population, leading to an increase in the average amount of electricity consumed per person (per capita electricity consumption).

Tariff	: LT - Residential	Bill Number	: 384756
Type of Supply	: Single Phase	Connected Load	: 3 kW
Meter Reading Date	: 31-11-13	Meter Reading	: 65789
Previous Reading Date	: 31-10-13	Previous Meter Reading	: 65500
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A survey is conducted for 56 families of a Colony A. The following tables gives the weekly consumption of electricity of these families.

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No. of families	16	12	18	6	4	0

The similar survey is conducted for 80 families

of Colony B and the data is recorded as below:

Weekly consumption (in units)	0-10	10-20	20-30	30-40	40-50	50-60
No. of families	0	5	10	20	40	5

Refer to data received from Colony A

The mean weekly consumption is

A. 19.64 units

B. 22.5 units

C. 26 units

D. None of these

Answer: A

3. Electricity energy consumption is the form of energy consumption that uses electric energy. Global electricity consumption continues to increase faster than world population, leading to an increase in the average amount of electricity consumed per person (per capita electricity consumption).

Tariff	: LT - Residential	Bill Number	: 384756
Type of Supply	: Single Phase	Connected Load	: 3 kW
Meter Reading Date	: 31-11-13	Meter Reading	: 65789
Previous Reading Date	: 31-10-13	Previous Meter Reading	: 65500
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A survey is conducted for 56 families of a

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consumption of electricity of these families.

Weekly consumption (in units)	0-10	10-20	20-30	30-40	40-50	50-60
No. of families	16	12	18	6	4	0

The similar survey is conducted for 80 families

of Colony B and the data is recorded as below:

Weekly consumption (in units)	0-10	10-20	20-30	30-40	40-50	50-60
No. of families	0	5	10	20	40	5

Refer to data received from Colony A

The modal class of the above data is I

A. $0 - 10$

B. $10 - 20$

C. $20 - 30$

D. $30 - 40$

Answer: C

▶ **Watch Video Solution**

4. Electricity energy consumption is the form of energy consumption that uses electric energy. Global electricity consumption continues to increase faster than world

population, leading to an increase in the average amount of electricity consumed per person (per capita electricity consumption).

Tariff	: LT - Residential	Bill Number	: 384756
Type of Supply	: Single Phase	Connected Load	: 3 kW
Meter Reading Date	: 31-11-13	Meter Reading	: 65789
Previous Reading Date	: 31-10-13	Previous Meter Reading	: 65500
		Units Consumed	: 289

A survey is conducted for 56 families of a Colony A. The following tables gives the weekly consumption of electricity of these families.

Weekly consumption (in units)	0-10	10-20	20-30	30-40	40-50	50-60
No. of families	16	12	18	6	4	0

The similar survey is conducted for 80 families of Colony B and the data is recorded as below:

Weekly consumption (in units)	0-10	10-20	20-30	30-40	40-50	50-60
No. of families	0	5	10	20	40	5

Refer to data received from Colony B

The modal weekly consumption is

A. 38.2 units

B. 43.6 units

C. 26 units

D. 32 units

Answer: B

5. Electricity energy consumption is the form of energy consumption that uses electric energy. Global electricity consumption continues to increase faster than world population, leading to an increase in the average amount of electricity consumed per person (per capita electricity consumption).

Tariff	: LT - Residential	Bill Number	: 384756
Type of Supply	: Single Phase	Connected Load	: 3 kW
Meter Reading Date	: 31-11-13	Meter Reading	: 65789
Previous Reading Date	: 31-10-13	Previous Meter Reading	: 65500
		Units Consumed	: 289

A survey is conducted for 56 families of a Colony A. The following tables gives the weekly consumption of electricity of these families.

Weekly consumption (in units)	0-10	10-20	20-30	30-40	40-50	50-60
No. of families	16	12	18	6	4	0

The similar survey is conducted for 80 families

of Colony B and the data is recorded as below:

Weekly consumption (in units)	0-10	10-20	20-30	30-40	40-50	50-60
No. of families	0	5	10	20	40	5

Refer to data received from Colony A

The mean weekly consumption is

A. 15.65 units

B. 32.8 units

C. 38.75 units

D. 48 units

Answer: C

Probability Case Study 1

1. On a weekend Rani was playing cards with her family .The deck has 52 cards.If her brother drew one card .

Find the probability of getting a king of red colour.

A. $\dfrac{1}{26}$

B. $\dfrac{1}{13}$

C. $\dfrac{1}{52}$

D. $\dfrac{1}{4}$

Answer: A

2. On a weekend Rani was playing cards with her family .The deck has 52 cards.If her brother drew one card .

Find the probability of getting a face card.

A. $\dfrac{1}{26}$

B. $\dfrac{1}{13}$

C. $\dfrac{2}{13}$

D. $\dfrac{3}{13}$

Answer: D

▶ **Watch Video Solution**

3. On a weekend Rani was playing cards with her family .The deck has 52 cards.If her brother drew one card .

Find the probability of getting a red face card.

A. $\dfrac{3}{13}$

B. $\dfrac{1}{13}$

C. $\dfrac{1}{52}$

D. $\dfrac{1}{4}$

Answer: B

4. On a weekend Rani was playing cards with her family .The deck has 52 cards.If her brother drew one card .

Find the probability of getting a jack of hearts.

A. $\dfrac{3}{13}$

B. $\dfrac{1}{13}$

C. $\dfrac{1}{52}$

D. $\dfrac{1}{4}$

Answer: A

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5. On a weekend Rani was playing cards with her family .The deck has 52 cards.If her brother drew one card .

Find the probability of getting a spade.

A. $\dfrac{1}{26}$

B. $\dfrac{1}{13}$

C. $\dfrac{1}{52}$

D. $\dfrac{1}{4}$

Answer: D

Probability Case Study 2

1. Rahul and Ravi planned to play Business (board game) in which they were supposed to use two dice.

Ravi got first chance to roll the dice. What is the probability that he got the sum of the two

numbers appearing on the top face of the dice

is 8?

A. $\dfrac{1}{26}$

B. $\dfrac{5}{36}$

C. $\dfrac{1}{18}$

D. 0

Answer: B

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2. Rahul and Ravi planned to play Business (board game) in which they were supposed to use two dice.

Rahul got next chance. What is the probability that he got the sum of the two numbers appearing on the top face of the dice is 13?

A. 1

B. $\dfrac{5}{36}$

C. $\dfrac{1}{18}$

D. 0

Answer: D

3. Rahul and Ravi planned to play Business (board game) in which they were supposed to use two dice.

Now it was Ravi's turn. He rolled the dice. What

is the probability that he got the sum of the two numbers appearing on the top face of the dice is less than or equal to 12 ?

A. 1

B. $\dfrac{5}{36}$

C. $\dfrac{1}{18}$

D. 0

Answer: A

4. Rahul and Ravi planned to play Business (board game) in which they were supposed to use two dice.
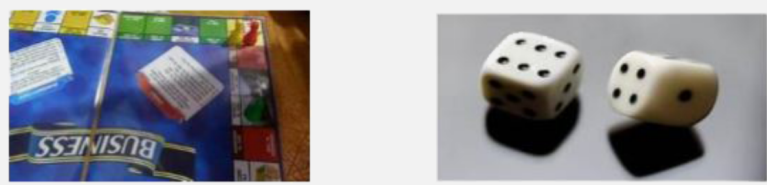
Rahul got next chance. What is the probability that he got the sum of the two numbers appearing on the top face of the dice is equal to 7 ?

A. $\dfrac{5}{9}$

B. $\dfrac{5}{36}$

C. $\dfrac{1}{6}$

D. 0

Answer: C

▶ **Watch Video Solution**

5. Rahul and Ravi planned to play Business (board game) in which they were supposed to use two dice.

Now it was Ravi's turn. He rolled the dice. What is the probability that he got the sum of the two numbers appearing on the top face of the dice is greater than 8 ?

A. 1

B. $\dfrac{5}{36}$

C. $\dfrac{1}{18}$

D. $\dfrac{5}{18}$

Answer: D

▶ **Watch Video Solution**

1. A biogas plant is where biogas is produced by fermenting biomass
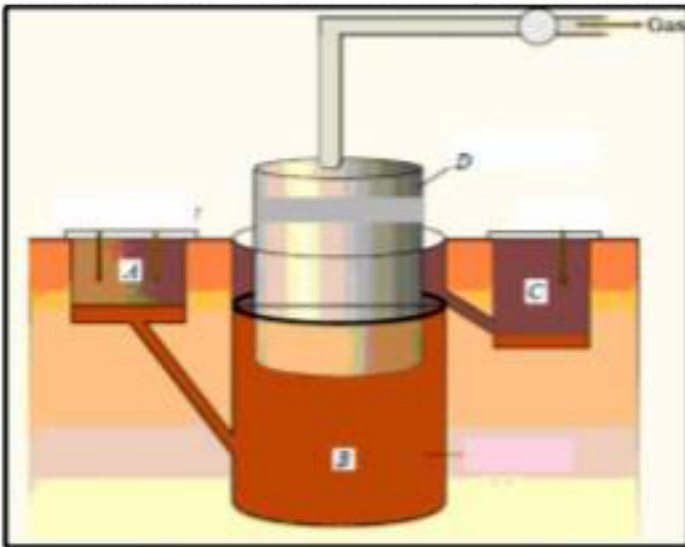
In which of the parts would you find anaerobic bacteria ?

A. A

B. B

C. C

D. D

Answer: B

▶ **Watch Video Solution**

2. A biogas plant is where biogas is produced

by fermenting biomass
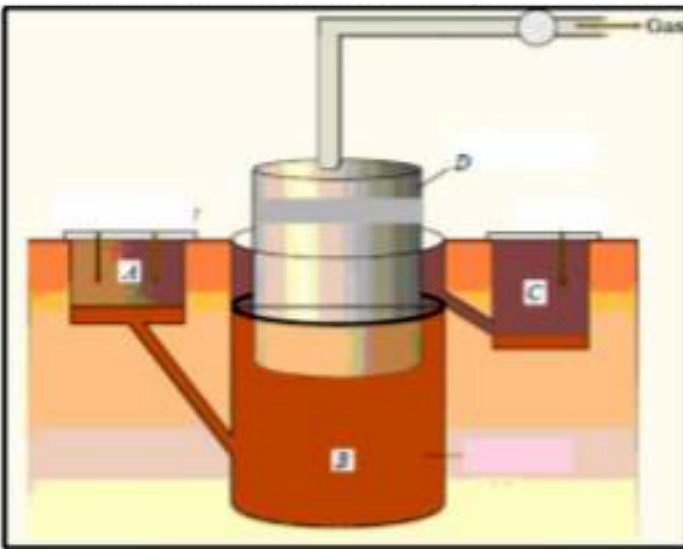
Which one of the following is NOT correct for biogas

    A. its carbon neutral

    B. its non-renewable

    C. it depends on micro-organisms

    D. yields rich manure

Answer: B

3. A biogas plant is where biogas is produced by fermenting biomass
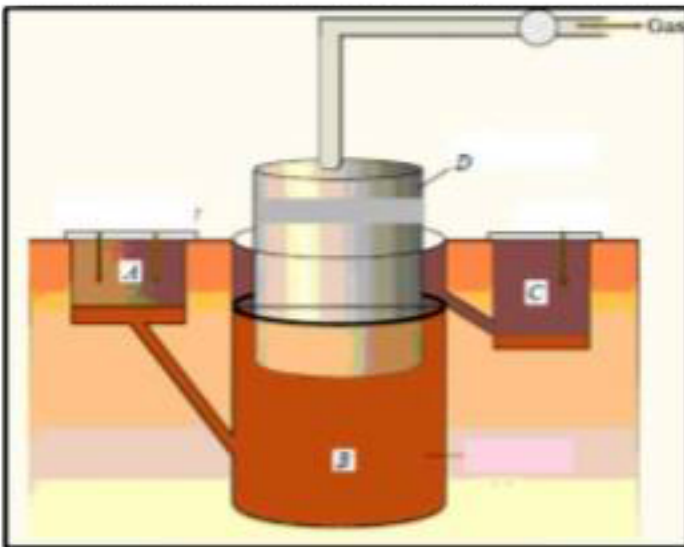
Which of the following best indicates the steps of anaerbic diaestion?

A. Waste watezr feed → biogas storage → generator → biogas b

B. Waste water feed → digester → biogas → biogas storage → generator

C. Generator → waste water feed → digester → biogas → biogas storage

D. Waste water feed $\rightarrow$ biogas $\rightarrow$

digester $\rightarrow$ biogas storage $\rightarrow$

generator

Answer: B

▶ **Watch Video Solution**

4. A biogas plant is where biogas is produced by fermenting biomass
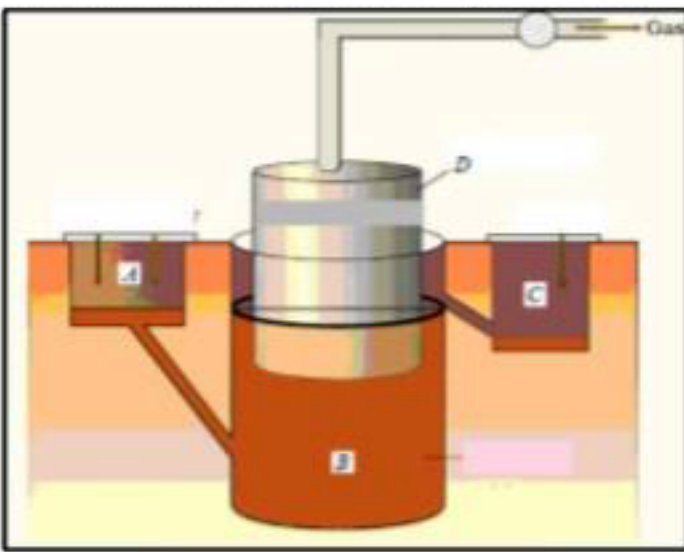
Biogas is a better fuel than animal dung cake because q

(a)Biogas is a renewable source of energy

(b) Animal dung cake has higher calorific value

(c) Biogas has high heating capacity

(d)Biogas burns without smoke

A. (a) only

B. (b) only

C. (c) and (d)

D. (a) and (b)

Answer: C

▶ Watch Video Solution

5. A biogas plant is where biogas is produced

by fermenting biomass
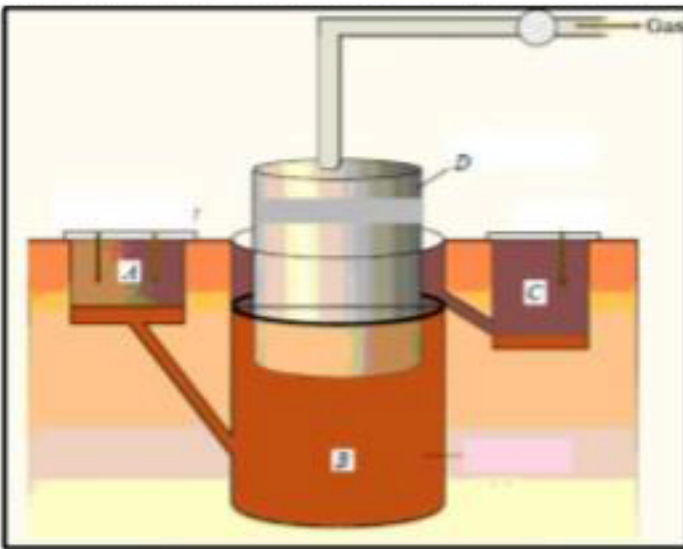
Biogas is formed in the

A. presence of air only

B. presence of water only

C. presence of air and absence of water

D. presence of water and absence of air

Answer: D

6. Food chains are very important for the survival of most species
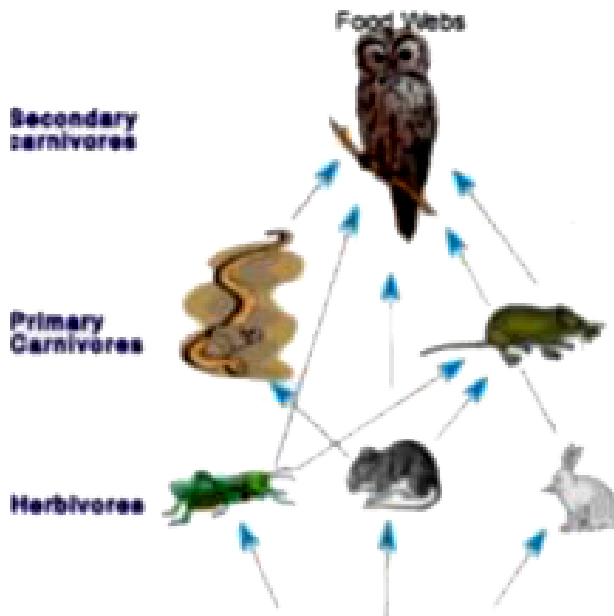
If 10,000 J solar energy falls on green plants in a terrestrial ecosystem, what percentage of solar energy will be converted into food energy?

A. $10, 000J$

B. $100J$

C. $1000J$

D. It will depend on the type of the terrestrial plant

Answer: B

7. Food chains are very important for the survival of most species

Food Webs

Secondary carnivores

Primary Carnivores

Herbivores
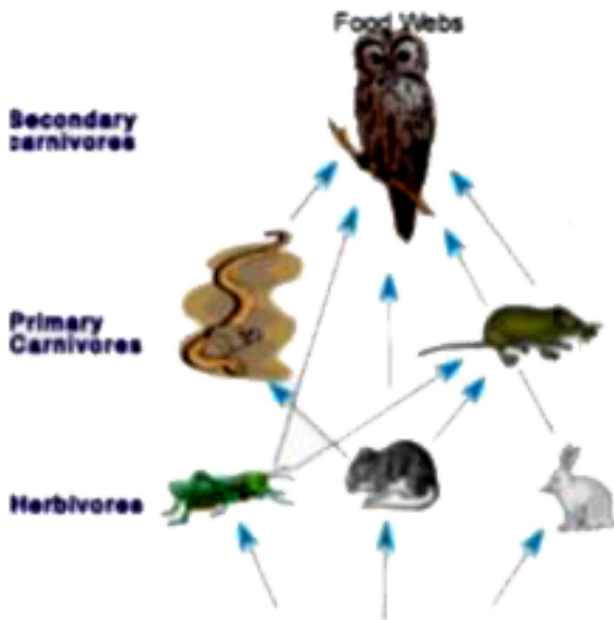
If Ravi is consuming curd/yogurt for lunch ,

which trophic level in a food chain he should be considered as occupying ?

A. First trophic level

B. Second trophic level

C. Third trophic level

D. Fourth trophic level

Answer: C

▶ Watch Video Solution

8. Food chains are very important for the survival of most species
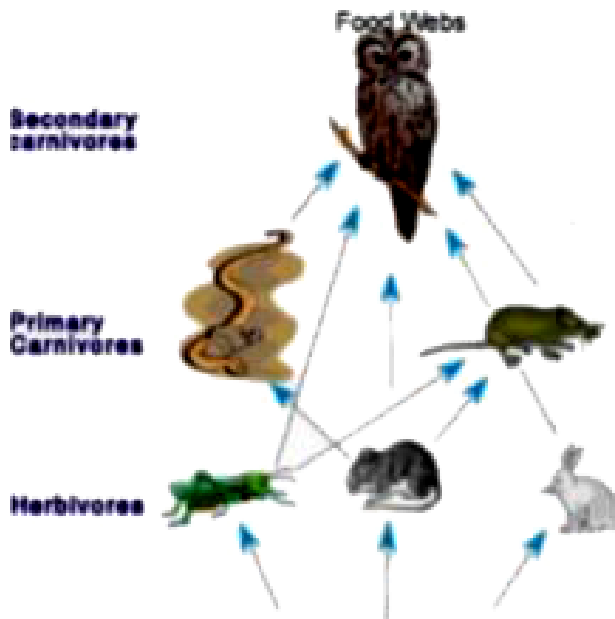
Food Webs

Secondary carnivores

Primary Carnivores

Herbivores

The decomposers are not included in the food chain.The correct reason for the same is because decomposers:

A. Act at every trophic level of the food

chain

B. Do not breakdown organic compounds

C. Convert organic material to inorganic

forms

D. Release enzymes outside their body to

convert organic material to inorganic

forms

Answer: A

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9. Food chains are very important for the survival of most species
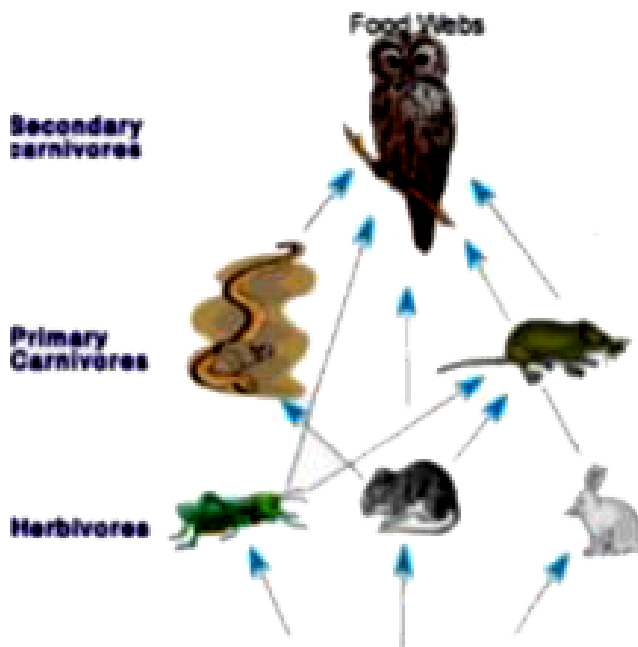
survival of most species

Food Webs

Secondary carnivores

Primary Carnivores

Herbivores

Matter and energy are two fundamental inputs of an ecosystem. Movement of

A. Energy is bidirectional and matter is repeatedly circulating

B. Energy is repeatedly circulation and matter is unidirectional

C. Energy is unidirectional and matter is repeatedly circulating

D. Energy is multidirectional and matter is bidirectional

Answer: C

10. Food chains are very important for the survival of most species

Food Webs

Secondary carnivores

Primary Carnivores

Herbivores

Which of the following limits the number of trophic levels in a food chain?

A. Decrease in energy at higher trophic levels

B. Less availability of food

C. Polluted air

D. Water

Answer: A

▶ **Watch Video Solution**

11. Observe the food web and answer the questions given below -
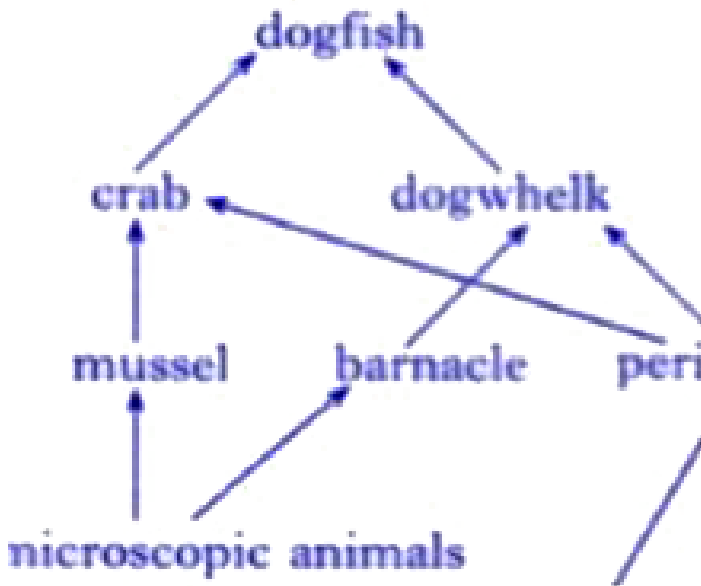
The mussel can be described as

A. Producer

B. Primary consumer

C. Secondary consumer

D. decomposer

Answer: C

▶ **Watch Video Solution**

12. Observe the food web and answer the questions given below -
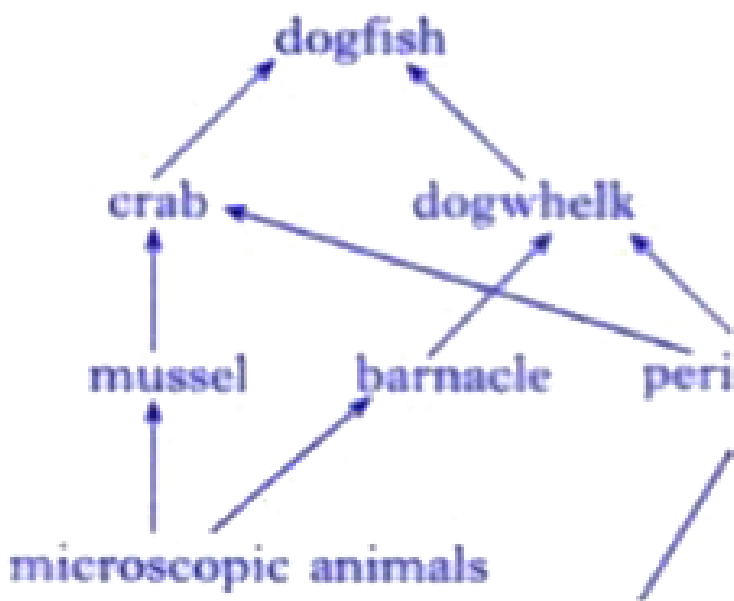
Which trophic level is incorrectly defined?

A. Carnivores – secondary or tertiary consumers

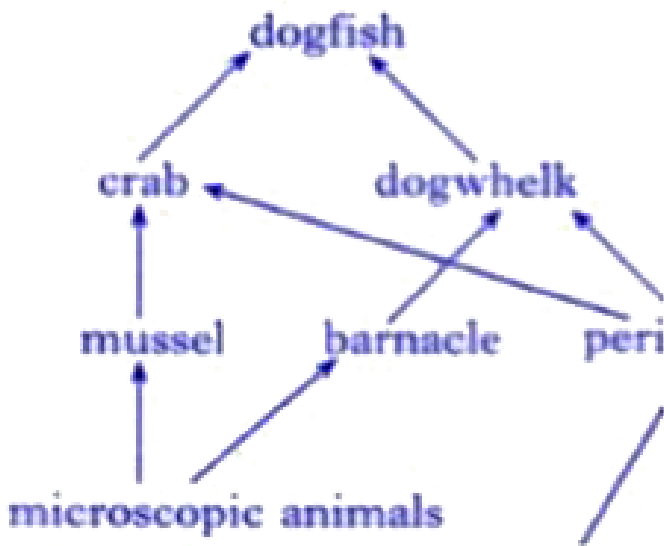B. Decomposers – microbial heterotrophs

C. Herbivores – primary consumers

D. Omnivores – molds, yeast and

mushrooms

Answer: D

▶ **Watch Video Solution**

13. Observe the food web and answer the

questions given below -

The given figure best represents:

A. Grassland food chain

B. Parasitic food chain

C. Forest food chain

D. Aquatic food chain

Answer: A

▶ **Watch Video Solution**

14. Observe the food web and answer the questions given below -

Why do all food chains start with plants?

    A. Because plants are easily grown

    B. Because plants are nutritious
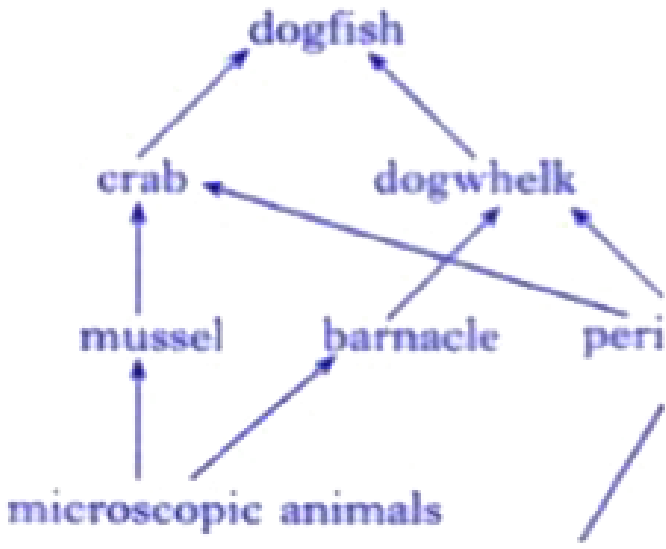
    C. Because plants can produce its own

       energy
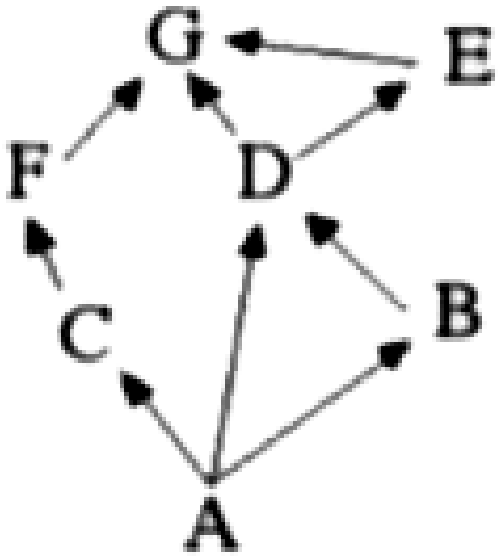
D. Because plants do not require energy

Answer: C

> ▶ **Watch Video Solution**

15. Observe the food web and answer the questions given below -

dogfish

crab   dogwhelk

mussel   barnacle   peri

microscopic animals

In the food web, what two organisms are competing for food ?

A. A and B

B. A and C

C. D and F

D. B and D

Answer: D

▶ **Watch Video Solution**

16.

Choose the waste management strategy that is matched with correct example

A. Refuse - choose products that use less packing

B. Reduce - Give unwanted toys and books to hospitals or schools

C. Reuse -Not using single use plastic

D. Repurpose -Making flower pot from used

plastic bottle

Answer: D

▶ **Watch Video Solution**

17.

Recycling of paper is a good practice but recycled paper should not be used as food packaging because

A. recycled papers may release color /dyes on food items

B. recycled papers are not absorbent

C. recycled papers can cause infection due

   to release of methane

D. recycled papers are costly

Answer: C

▶ **Watch Video Solution**

Refuse
what you do not need

Reduce
what you do need

Reuse
what you consume

Recycle
what you cannot refuse,
reduce, or reuse

Rot
(compost)
the
rest

18.

According to the 'Solid Waste Management Rule 2016', the waste should be segregated into three categories. Observe the table below and select the row that has correct information

	Wet waste	Dry waste	Hazardous waste
a)	Cooked food, vegetable peels	Used bulbs, fluorescent lamps	Plastic carry bags, bottles, newspaper, cardboard
b)	Coffee and tea powder, garden waste	Plastic carry bags, bottles, newspaper, cardboard	Expired medicines, razors, paint cans
c)	Leftover food, vegetable peels	Coffee and tea powder, garden waste	Insect repellents, cleaning solutions
d)	Uncooked food, tea leaves	Old crockery, frying pans	Coffee and tea powder, garden waste

Refuse
what you do not need

Reduce
what you do need

Reuse
what you consume

Recycle
what you cannot refuse,
reduce, or reuse

Rot
(compost)
the
rest

19.

Effective segregation of wastes at the point of generation is very important. Select the appropriate statements giving the importance of waste segregation.

(i)less waste goes to the landfills

(ii) better for public health and the environment

(iii)help in reducing the waste

(iv) resulting in deterioration of a waste picker's health

A. both i) and ii)

B. both i) and iii)

C. both ii) and iii)

D. both i) and iv)

Answer: A

Refuse
what you do not need

Reduce
what you do need

Reuse
what you consume

Recycle
what you cannot refuse,
reduce, or reuse

Rot
(compost)
the
rest

20.

When recycling a plastic water bottle, what should you do with the cap?

A. The cap goes into a garbage can and the bottle goes in a recycling bin

B. Screw the cap back on the bottle, then put the bottle and cap in a recycling bin

C. Screw the cap back on the bottle, then put the bottle and cap in the garbage can

D. Recycle the cap separately.
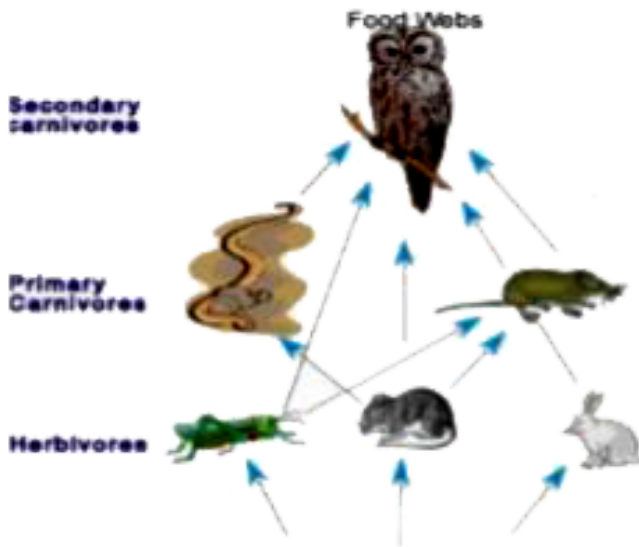
Answer: A

▶ **Watch Video Solution**

21. Food chains are very important for the survival of most species. When only one element is removed from the food chain it can result in extinction of a species in some cases. The foundation of the food chain consists of primary producers

Primary producers, or autotrophs, can use either solar energy or chemical energy to create complex organic compounds, whereas species at higher trophic levels cannot and so must consume producers or other life that itself consumes producers. Because the sun's

light is necessary for photosynthesis, most life could not exist if the sun disappeared. Even so, it has recently been discovered that there are some forms of life, chemotrophs, that appear to gain all their metabolic energy from chemosythesis driven by hydrothermal vents, thus showing that some life may not require solar energy to thrive.

Food Webs

Secondary carnivores

Primary Carnivores

Herbivores

If 10,000 J solar energy falls on green plants in a terrestrial ecosystem, what percentage of solar energy will be converted into food energy?

A. 10, 000J

B. 100J

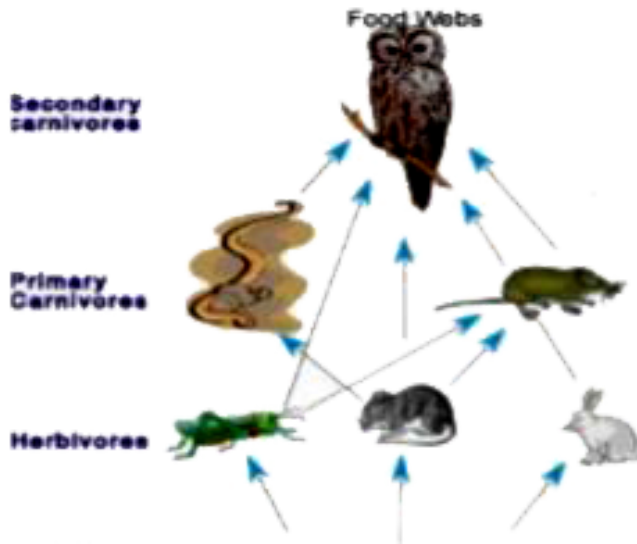C. 1000J

D. It will depend on the type of the terrestrial plant.

Answer: B

22. Food chains are very important for the survival of most species. When only one element is removed from the food chain it can result in extinction of a species in some cases. The foundation of the food chain consists of primary producers

Primary producers, or autotrophs, can use either solar energy or chemical energy to create complex organic compounds, whereas species at higher trophic levels cannot and so

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Food Webs

Secondary carnivores

Primary Carnivores

Herbivores

Mr. X is eating curd/yogurt. For this food intake in a food chain he should be considered as occupying

A. First trophic level

B. Second trophic level

C. Third trophic level
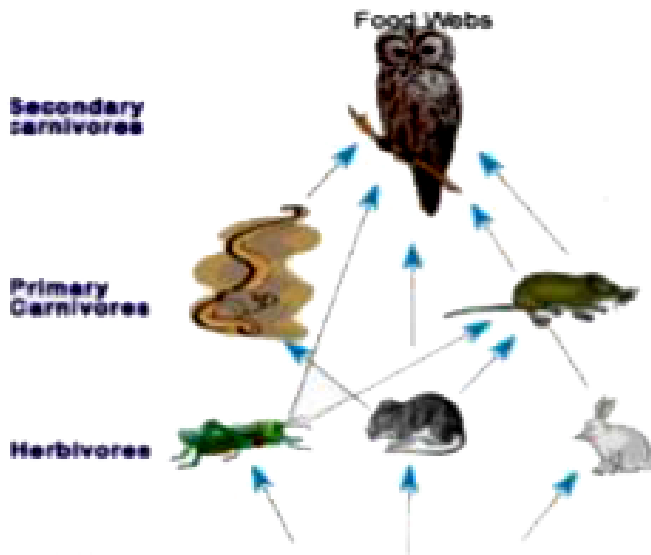
D. Fourth trophic level

Answer: C

▶ **Watch Video Solution**

23. Food chains are very important for the survival of most species. When only one element is removed from the food chain it can result in extinction of a species in some cases. The foundation of the food chain consists of primary producers

Primary producers, or autotrophs, can use either solar energy or chemical energy to create complex organic compounds, whereas species at higher trophic levels cannot and so must consume producers or other life that itself consumes producers. Because the sun's light is necessary for photosynthesis, most life could not exist if the sun disappeared. Even so, it has recently been discovered that there are some forms of life, chemotrophs, that appear to gain all their metabolic energy from chemosythesis driven by hydrothermal vents, thus showing that some life may not require

solar energy to thrive.

Food Webs

Secondary
carnivores

Primary
Carnivores

Herbivores

The decomposers are not included in the food

chain. The correct reason for the same is

because decomposers:

A. Act at every trophic level of the food

   chain

B. Do not breakdown organic compounds

C. Convert organic material to inorganic forms

D. Release enzymes outside their body to convert organic material to inorganic forms
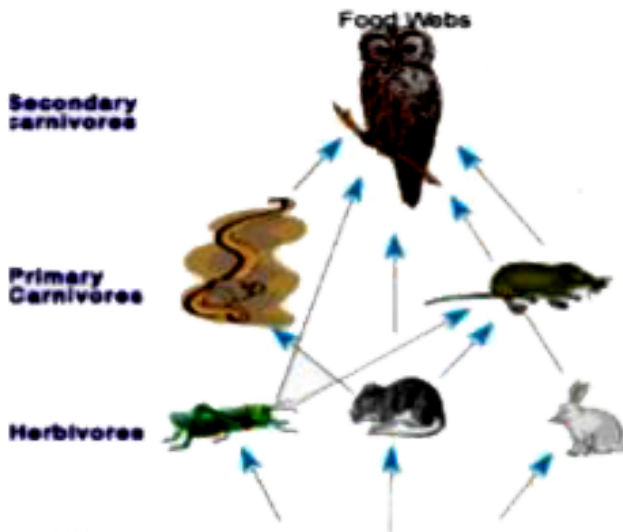
Answer: A

24. Food chains are very important for the survival of most species. When only one element is removed from the food chain it can result in extinction of a species in some cases. The foundation of the food chain consists of primary producers

Primary producers, or autotrophs, can use either solar energy or chemical energy to create complex organic compounds, whereas species at higher trophic levels cannot and so must consume producers or other life that itself consumes producers. Because the sun's

light is necessary for photosynthesis, most life could not exist if the sun disappeared. Even so, it has recently been discovered that there are some forms of life, chemotrophs, that appear to gain all their metabolic energy from chemosythesis driven by hydrothermal vents, thus showing that some life may not require solar energy to thrive.

Food Webs

Secondary
carnivores

Primary
Carnivores

Herbivores

Matter and energy are two fundamental inputs of an ecosystem. Movement of

A. Energy is bidirectional and matter is repeatedly circulating.

B. Energy is repeatedly circulation and matter is unidirectional

C. Energy is unidirectional and matter is repeatedly circulating

D. Energy is multidirectional and matter is bidirectional

Answer: C

▶ Watch Video Solution

25. Food chains are very important for the survival of most species. When only one element is removed from the food chain it can

result in extinction of a species in some cases.

The foundation of the food chain consists of primary producers

Primary producers, or autotrophs, can use either solar energy or chemical energy to create complex organic compounds, whereas species at higher trophic levels cannot and so must consume producers or other life that itself consumes producers. Because the sun's light is necessary for photosynthesis, most life could not exist if the sun disappeared. Even so, it has recently been discovered that there are some forms of life, chemotrophs, that appear

to gain all their metabolic energy from chemosythesis driven by hydrothermal vents, thus showing that some life may not require solar energy to thrive.

Food Webs

Secondary carnivores

Primary Carnivores

Herbivores

Which of the following limits the number of trophic levels in a food chain?

A. Decrease in energy at higher trophic

levels

B. Less availability of food

C. Polluted air
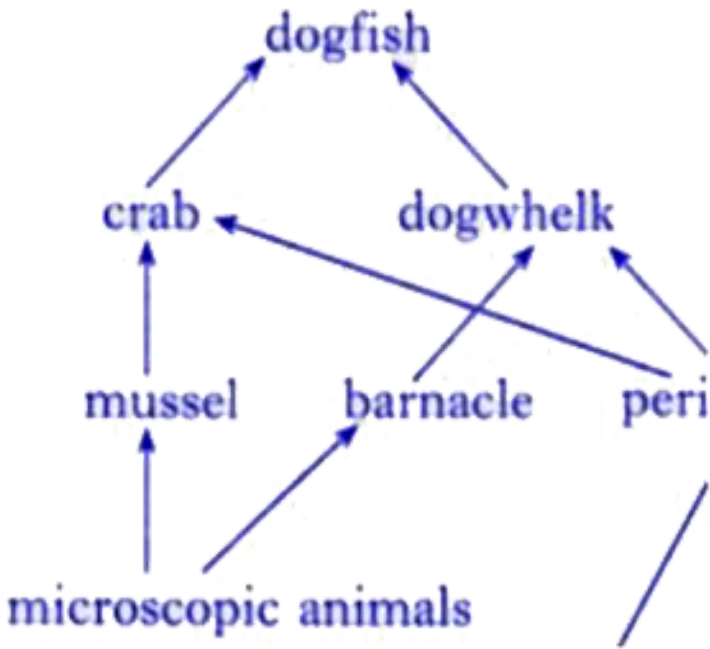
D. Water

Answer: A

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26. Biosphere is a global ecosystem composed of living organisms and abiotic factors from which they derive energy and nutrients. And ecosystem is defined as structural and functional unit of the biosphere comprising of living and non-living environment that interact by means of food chains and chemical cycles resulting in energy flow, biotic diversity and material cycling to form a stable, self-supporting system

Biotic vs. Abiotic Factors

- Living
- Examples
  - Plants
  - Animals
  - Fungi
  - Bacteria

- Non-Living
- Examples
  - Water
  - Sunlight
  - Soil
  - Air
  - Temperatu

Which trophic level is incorrectly defined?

A. Carnivores – secondary or tertiary

consumers

B. Decomposers – microbial heterotrophs

C. Herbivores – primary consumers

D. Omnivores – molds, yeast and

mushrooms

Answer: D

▶ **Watch Video Solution**

27. Biosphere is a global ecosystem composed

of living organisms and abiotic factors from

which they derive energy and nutrients. And

ecosystem is defined as structural and

functional unit of the biosphere comprising of

living and non-living environment that interact by means of food chains and chemical cycles resulting in energy flow, biotic diversity and material cycling to form a stable, self-supporting system

Biotic vs. Abiotic Factors

□ Living
○ Examples
 □ Plants
 □ Animals
 □ Fungi
 □ Bacteria

□ Non-Living
□ Examples
 □ Water
 □ Sunlight
 □ Soil
 □ Air
 □ Temperatu

The diagram below shows a food web from the sea shore

dogfish

crab   dogwhelk

mussel   barnacle   peri

microscopic animals

The mussel can be described as

   A. Producer

   B. Primary consumer

   C. Secondary consumer

   D. Decomposer

Answer: C
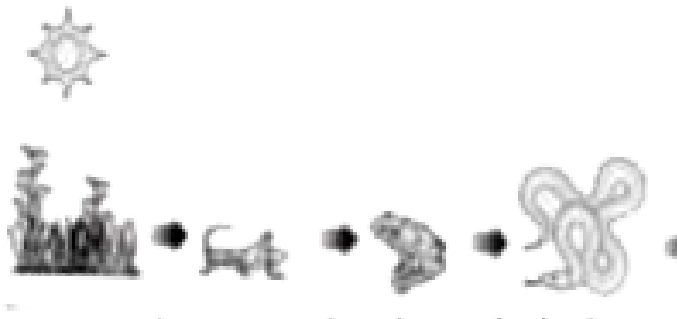
28. Biosphere is a global ecosystem composed of living organisms and abiotic factors from which they derive energy and nutrients. And ecosystem is defined as structural and functional unit of the biosphere comprising of living and non-living environment that interact by means of food chains and chemical cycles resulting in energy flow, biotic diversity and

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Biotic vs. Abiotic Factors

- Living
  - Examples
    - Plants
    - Animals
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    - Bacteria

- Non-Living
  - Examples
    - Water
    - Sunlight
    - Soil
    - Air
    - Temperatu

The given figure best represents:

A. Grassland food chain

B. Parasitic food chain

C. Forest food chain

D. Aquatic food chain

Answer: A

 Watch Video Solution

29. Biosphere is a global ecosystem composed of living organisms and abiotic factors from which they derive energy and nutrients. And ecosystem is defined as structural and

functional unit of the biosphere comprising of living and non-living environment that interact by means of food chains and chemical cycles resulting in energy flow, biotic diversity and material cycling to form a stable, self-supporting system

Biotic vs. Abiotic Factors

- Living
  - Examples
    - Plants
    - Animals
    - Fungi
    - Bacteria

- Non-Living
  - Examples
    - Water
    - Sunlight
    - Soil
    - Air
    - Temperatu

Consider the following statements concerning food chains: (i) Removal of 80% tigers from an

area resulted in greatly increased growth of vegetation (ii) Removal of most of the carnivores resulted in an increased population of herbivores. (iii) The length of the food chains is generally limited to 3 – 4 trophic levels due to energy loss (iv) The length of the food chains may vary from 2 to 8 trophic levels

Which two of the above statements are correct?

A. (i), (iv)

B. (i), (ii)

C. (ii), (iii)

D. (iii), (iv)

Answer: C

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30. Biosphere is a global ecosystem composed of living organisms and abiotic factors from which they derive energy and nutrients. And ecosystem is defined as structural and functional unit of the biosphere comprising of living and non-living environment that interact

by means of food chains and chemical cycles resulting in energy flow, biotic diversity and material cycling to form a stable, self-supporting system

Biotic vs. Abiotic Factors

□ Living
○ Examples
  □ Plants
  □ Animals
  □ Fungi
  □ Bacteria

□ Non-Living
○ Examples
  ○ Water
  ○ Sunlight
  ○ Soil
  ○ Air
  ○ Temperatu

Which of the following group of organisms are not included in ecological food chain?

A. Carnivores

B. Saprophytes

C. Herbivores

D. Predators

Answer: B

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31. Marble's popularity began in ancient Rome and Greece, where white and off-white marble were used to construct a variety of structures, from hand-held sculptures to massive pillars

and buildings.

The substance not likely to contain $CaCO_3$ is

A. Dolomite

B. A marble statue

C. Calcined gypsum

D. Sea shells.

Answer:

32. Marble's popularity began in ancient Rome and Greece, where white and off-white marble were used to construct a variety of structures, from hand-held sculptures to massive pillars and buildings.

A student added 10g of calcium carbonate in a rigid container, secured it tightly and started to heat it. After some time, an increase in pressure was observed, the pressure reading was then noted at intervals of 5 mins and plotted against time, in a graph as shown below. During which time interval did

maximum decomposition took place?

A. 15-20 min

B. 10-15 min

C. 5-10 min

D. 0-5 min

Answer: D

33. Marble's popularity began in ancient Rome and Greece, where white and off-white marble were used to construct a variety of structures, from hand-held sculptures to massive pillars and buildings.

Gas A, obtained above is a reactant for a very

important biochemical process which occurs in the presence of sunlight. Identify the name of the process

A. Respiration

B. Photosynthesis

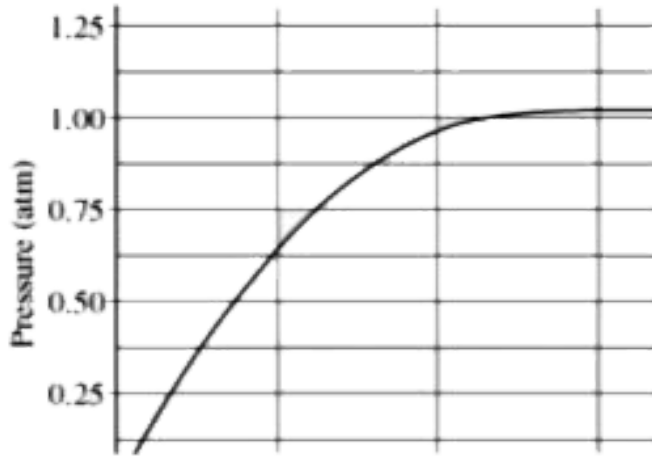C. Transpiration

D. sphotolysis

Answer: B

▶ **Watch Video Solution**

34. Marble's popularity began in ancient Rome and Greece, where white and off-white marble were used to construct a variety of structures, from hand-held sculptures to massive pillars and buildings.

Marble statues are corroded or stained rain

water. Identify the main reason

A. decomposition of calcium carbonate to

calcium oxide

B. polluted water is basic in nature hence it

reacts with calcium carbonate

C. polluted water is acidic in nature hence

it reacts withc calcium carbonate

D. calcium carbonate dissolves in water to

give calcium hydroxide.

Answer: C

▶ **Watch Video Solution**

35. Marble's popularity began in ancient Rome

and Greece, where white and off-white marble

were used to construct a variety of structures,

from hand-held sculptures to massive pillars

and buildings.

Calcium oxide can be reduced to calcium, by heating with sodium metal. Which compound would act as an oxidizing agent in the above process

A. Sodium

B. sodium oxide

C. calcium

D. calcium oxide

Answer: D

> ▶ **Watch Video Solution**

36. The reaction between MnO_2 with HCl is depicted in the following diagram. It was observed that a gas with bleaching abilities was released

HCl (aq)

← MnO₂(s)

REACTANTS

PRODUCTS

The chemical reaction between MnO_2 and HCl

is an example of:

A. displacement reaction

B. combination reaction

C. redox reaction

D. decomposition reaction

Answer: C

37. The reaction between MnO_2 with HCl is depicted in the following diagram. It was observed that a gas with bleaching abilities was released
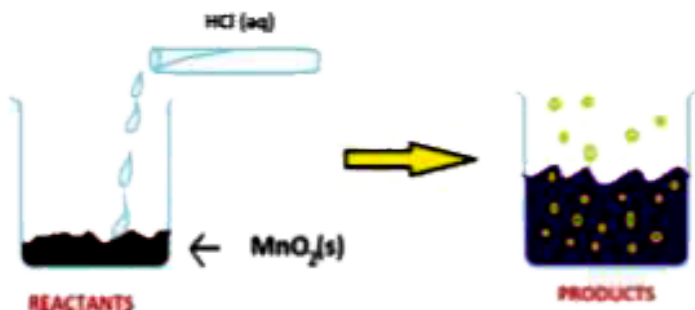
Chlorine gas reacts with _____ to form bleaching powder

A. dry $Ca(OH)_2$

B. dil. solution of $Ca(OH)_2$

C. conc. solution of $Ca(OH)_2$

D. dry CaO

Answer: A

▶ **Watch Video Solution**

38. The reaction between MnO_2 with HCl is depicted in the following diagram. It was observed that a gas with bleaching abilities

was released
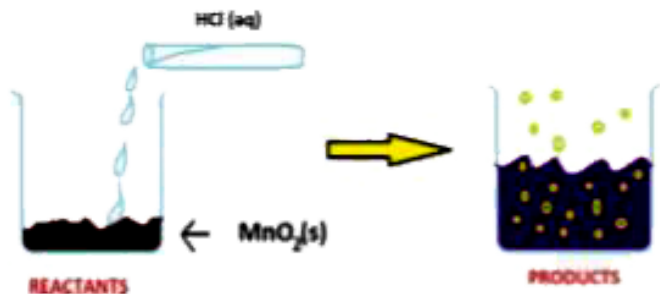
Identify the correct statement from the following

MnO_2 is getting reduced whereas HCl is getting oxidized

A. MnO_2 is getting oxidized whereas HCl is getting reduced.

B. MnO_2 and HCl both are getting reduced.

C. MnO_2 and HCl both are getting

oxidized

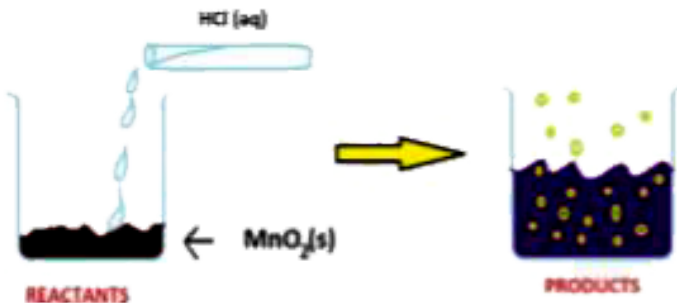D. MnO_2 IS getting reduced and HCL is

getting oxidized

Answer: A

▶ **Watch Video Solution**

39. The reaction between MnO_2 with HCl is

depicted in the following diagram. It was

observed that a gas with bleaching abilities

was released

HCl (aq)

← MnO₂(s)

REACTANTS

PRODUCTS
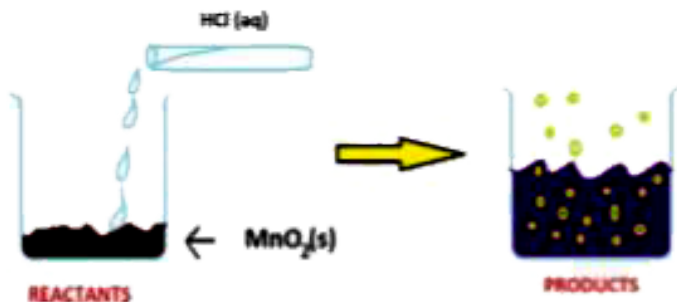
In the above discussed reaction, what is the

nature of MnO_2

A. Acidic oxide

B. Basic oxide

C. Neutral oxide

D. Amphoteric oxide

Answer: B

40. The reaction between MnO_2 with HCl is depicted in the following diagram. It was observed that a gas with bleaching abilities was released
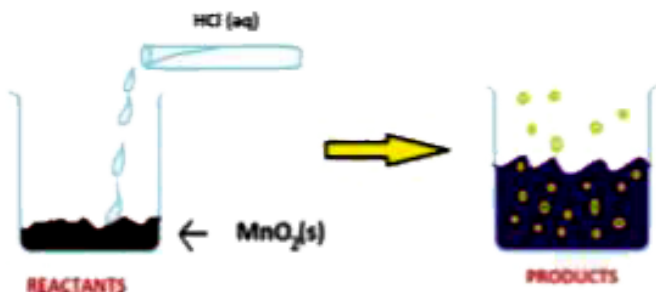
What will happen if we take dry HCl gas instead of aqueous solution of HCl?

A. Reaction will occur faster

B. Reaction will not occur

C. Reaction rate will be slow

D. Reaction rate will remain the same

Answer: B

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41. For an internal combustion engine to move a vehicle down the road ,it must convert the energy stored in the fuel into mechanical energy to drive the wheels. In your car, the distributor and battery provide this starting energy by creating an electrical "spark", which helps in combustion of fuels like gasoline. Below is the reaction depicting complete combustion of gasoline in full supply of air:

$$2C_8H_{18}(l) + 25O_2(g) \rightarrow 16'x'$$
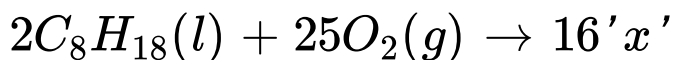
Which of the following are the products obtained from the reaction mentioned in the

above case?

Product 'X' product 'Y'

A. CO_2 H_2O_2

B. H_2O CO

C. CH_3OH H_2O

D. CO_2 H_2O

Answer: D

42. For an internal combustion engine to move a vehicle down the road ,it must convert the energy stored in the fuel into mechanical energy to drive the wheels. In your car, the distributor and battery provide this starting energy by creating an electrical "spark", which helps in combustion of fuels like gasoline. Below is the reaction depicting complete combustion of gasoline in full supply of air:

$$2C_8H_{18}(l) + 25O_2(g) \rightarrow 16'x'$$

Identify the types of chemical reaction occurring during the combustion of fuel

A. Oxidation & Endothermic reaction

B. Decomposition & Exothermic reaction

C. Oxidation & Exothermic reaction

D. Combination & Endothermic reaction

Answer: C

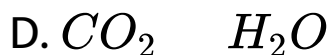▶ Watch Video Solution

43. For an internal combustion engine to move a vehicle down the road ,it must convert the energy stored in the fuel into mechanical

energy to drive the wheels. In your car, the distributor and battery provide this starting energy by creating an electrical "spark", which helps in combustion of fuels like gasoline. Below is the reaction depicting complete combustion of gasoline in full supply of air:

$$2C_8H_{18}(l) + 25O_2(g) \rightarrow 16'x'$$

On the basis of evolution/absorption of energy, which of the following processes are similar to combustion of fuel?

(a) Photosynthesis in plants

(b)Respiration in the human body

(c) Decomposition of vegetable matter

(d) Decomposition of ferrous sulphate .

A. (ii) & (iii)

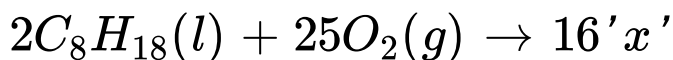B. (i) & (ii)

C. (iii) & (iv)

D. (ii) & (i)

Answer: A

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44. For an internal combustion engine to move a vehicle down the road,it must convert the energy stored in the fuel into mechanical energy to drive the wheels. In your car,the distributor and battery provide this starting energy by creating an electrical "spark",which helps in combustion of fuels like gasoline. Below is the reaction depicting complete combustion of gasoline in full supply of air:

$$2C_8H_{18}(l) + 25O_2(g) \rightarrow 16'x'$$

'A student while walking on the road observed that a cloud of black smoke belched out from

the exhaust stack of moving trucks on the road.' Choose the correct reason for the production of black smoke:

A. Limited supply of air leads to incomplete combustion of fuel.

B. Rich supply of air leads to complete combustion of fuel.

C. Rich supply of air leads to a combination reaction

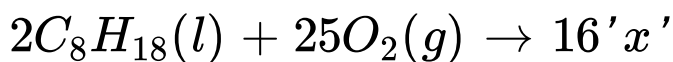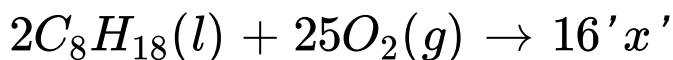D. Limited supply of air leads to complete

combustion of fuel

Answer: A

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45. For an internal combustion engine to

move a vehicle down the road, it must convert

the energy stored in the fuel into mechanical

energy to drive the wheels. In your car,the

distributor and battery provide this starting

energy by creating an electrical "spark",which helps in combustion of fuels like gasoline. Below is the reaction depicting complete combustion of gasoline in full supply of air:

$$2C_8H_{18}(l) + 25O_2(g) \rightarrow 16'x'$$
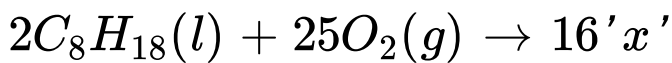
'Although nitrogen is the most abundant gas in the atmosphere, it does not combustion'. Identify the correct reason for this statement.

A. Nitrogen is a reactive gas

B. Nitrogen is an inert gas

C. Nitrogen is an explosive gas

D. Only hydrocarbons can take part in combustion

Answer: B

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46. Frothing in Yamuna:

The primary reason behind the formation of the toxic foam is high phosphate content in the wastewater because of detergents used in dyeing industries, dhobi ghats and

households .Yamuna's pollution level is so bad that parts of it have been labelled 'dead' as there is no oxygen in it for aquatic life to survive.

Predict the pH value of the water of river Yamuna if the reason for froth is high content of detergents dissolved in it

A. $10 - 11$

B. $5 - 7$

C. $2 - 5$

D. 7

Answer: A

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47. Frothing in Yamuna:

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the toxic foam is high phosphate content in

the wastewater because of detergents used in dyeing industries, dhobi ghats and households .Yamuna's pollution level is so bad that parts of it have been labelled 'dead' as there is no oxygen in it for aquatic life to survive.

Which of the following statements is correct for the water with detergents dissolved in it?

A. low concentration of hydroxide ion (OH^-)and high concentration of hydronium ion (H_3O^+)

B. high concentration of hydroxide ion (OH^-)and low concentration of hydronium ion (H_3O^+)

C. high concentration of hydroxide ion (OH^-) as well as hydronium ion (H_3O^+)

D. equal concentration of both hydroxide

ion (OH^-) and hydronium ion (H_3O^+).

Answer: B

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48. Frothing in Yamuna:

The primary reason behind the formation of

the toxic foam is high phosphate content in

the wastewater because of detergents used in

dyeing industries, dhobi ghats and

households .Yamuna's pollution level is so bad that parts of it have been labelled 'dead' as there is no oxygen in it for aquatic life to survive.

The table provides the pH value of four solutions P, Q, R and S

Solution	pH value
P	2
Q	9
R	5
S	11

Which of the following correctly represents

the solutions in increasing order of their

hydronium ion concentration?

A. $P > Q > R > S$

B. $P > S > Q > R$

C. $S < Q < R < P$

D. $S < P < Q < R$

Answer: C

49. Frothing in Yamuna:

The primary reason behind the formation of the toxic foam is high phosphate content in the wastewater because of detergents used in dyeing industries, dhobi ghats and households .Yamuna's pollution level is so bad that parts of it have been labelled 'dead' as there is no oxygen in it for aquatic life to

survive.

High content of phosphate ion in river Yamuna may lead to:

A. decreased level of dissolved oxygen and increased growth of algae

B. decreased level of dissolved oxygen and no effect of growth of algae

C. increased level of dissolved oxygen and

increased growth of algae

D. decreased level of dissolved oxygen and

decreased growth of algae

Answer: A

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50. Frothing in Yamuna:

The primary reason behind the formation of

the toxic foam is high phosphate content in

the wastewater because of detergents used in dyeing industries, dhobi ghats and households .Yamuna's pollution level is so bad that parts of it have been labelled 'dead' as there is no oxygen in it for aquatic life to survive.

If a sample of water containing detergents is

provided to you, which of the following methods will you adopt to neutralize it?

A. Treating the water with baking soda

B. Treating the water with vinegar

C. Treating the water with caustic soda

D. Treating the water with washing soda

Answer: B

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51. In Kunjpura village, located in Karnal district, Haryana, Aditya Aggarwal and his older brother Amit Aggarwal run Tee Cee Industries, a steel plant set up by their ancestors in 1984. Along with this, they also run a gaushala that houses 1,200 cows that can no longer produce milk.

The cow shelter was manageable but running the steel plant was turning out to be expensive because they spent a whopping Rs 5 lakh every month on electricity

The brothers struck upon an idea. Why not run

the factory with the biogas produced from cow dung from the shelter and other gaushalas , along with bio and agri-waste like sewage , etc this led Aditya and Amit to start Amrit Fertilisers, a biogas project, in 2014, without any government support.

Biogas is a mixture of the following gases.

A. Ethane,Carbon monoxide, Nitrogen and Butane

B. Methane,Hydrogen,Carbon dioxide and Nitrogen

C. Butane,Carbon monoxide,Propane and Hydrogen

D. Carbon monoxide,Sulphur dioxide and Hydrogen

Answer: B

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52. In Kunjpura village, located in Karnal district, Haryana, Aditya Aggarwal and his older brother Amit Aggarwal run Tee Cee

Industries, a steel plant set up by their ancestors in 1984. Along with this, they also run a gaushala that houses 1,200 cows that can no longer produce milk.

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Amrit Fertilisers, a biogas project, in 2014, without any government support.

Raw material used in bio gas plant is

A. Animal dung

B. crop residue

C. Food waste

D. All of the above

Answer: D

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53. In Kunjpura village, located in Karnal district, Haryana, Aditya Aggarwal and his older brother Amit Aggarwal run Tee Cee Industries, a steel plant set up by their ancestors in 1984. Along with this, they also run a gaushala that houses 1,200 cows that can no longer produce milk.

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The correct labelling in a biogas plant is given

in
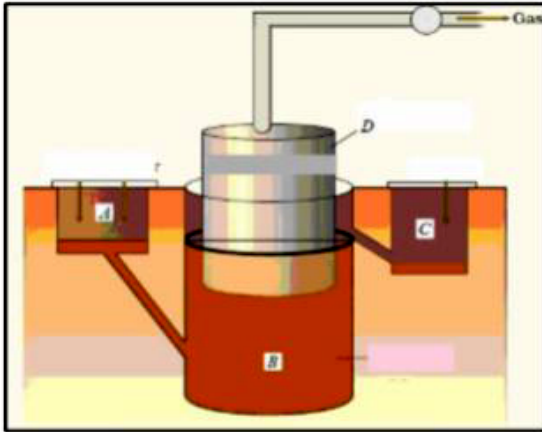
(a) A- Manure   B- slurry   C-Gas tank   D-Digester
(b)A- Slurry   B-Digester   C-Manure   D- Gas tank
(c) A-Gas tank   B-Manure   C-Digester   D- Slurry
(d) A- Digester   B-Gas tank   C-Slurry   D-Manure.

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54. In Kunjpura village, located in Karnal district, Haryana, Aditya Aggarwal and his older brother Amit Aggarwal run Tee Cee

Industries, a steel plant set up by their ancestors in 1984. Along with this, they also run a gaushala that houses 1,200 cows that can no longer produce milk.

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Amrit Fertilisers, a biogas project, in 2014, without any government support.

Biogas is a better fuel than animal dung cake because (i) Biogas has lower calorific value. (ii) Animal dung cake has higher calorific value. (iii) Biogas has high heating capacity. (iv) Biogas burns without smoke

A. (i) only

B. (ii) only

C. (iii) and (iv)

D. (i) and (ii)

Answer: C

55. In Kunjpura village, located in Karnal district, Haryana, Aditya Aggarwal and his older brother Amit Aggarwal run Tee Cee Industries, a steel plant set up by their ancestors in 1984. Along with this, they also run a gaushala that houses 1,200 cows that can no longer produce milk.

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Biogas is formed in the

A. presence of air only.

B. presence of water only.

C. absence of air only.

D. presence of water and absence of air.

Answer: D

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56. Waste management is essential in today's society. Due to an increase in population, the generation of waste is getting doubled day by day. Moreover, the increase in waste is

affecting the lives of many people.

Waste management is the managing of waste by disposal and recycling of it. Moreover, waste management needs proper techniques keeping in mind the environmental situations. For instance, there are various methods and techniques by which the waste is disposed of. You must have come across 5 R's to save the environment: refuse, reduce, reuse, repurpose and recycle.

Choose the waste management strategy that is matched with correct example

A. Refuse - choose products that use less

 packing

B. Reduce - Give unwanted toys and books

 to hospitals or schools

C. Reuse -Not using single use plastic

D. Repurpose -Making flower pot from used

 plastic bottle

Answer: D

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57. Waste management is essential in today's society. Due to an increase in population, the generation of waste is getting doubled day by day. Moreover, the increase in waste is affecting the lives of many people.

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environment: refuse, reduce, reuse, repurpose and recycle.

Recycling of paper is a good practice but recycled paper should not be used as food packaging because

    A. recycled papers take lots of space

    B. recycled papers can't cover food properly

    C. recycled papers can cause infection

    D. recycled papers are costly

Answer: C

58. Waste management is essential in today's society. Due to an increase in population, the generation of waste is getting doubled day by day. Moreover, the increase in waste is affecting the lives of many people.

Waste management is the managing of waste by disposal and recycling of it. Moreover, waste management needs proper techniques keeping in mind the environmental situations. For instance, there are various methods and

techniques by which the waste is disposed of.

You must have come across 5 R's to save the environment: refuse, reduce, reuse, repurpose and recycle.

According to the 'Solid Waste Management Rule 2016', the waste should be segregated into three categories. Observe the table below and select the row that has correct information

	Wet waste	Dry waste	Hazardous waste
a)	Cooked food, vegetable peels	Used bulbs, fluorescent lamps	Plastic carry bags, bottles, newspaper, cardboard
b)	Coffee and tea powder, garden waste	Plastic carry bags, bottles, newspaper, cardboard	Expired medicines, razors, paint cans
c)	Leftover food, vegetable peels	Coffee and tea powder, garden waste	Insect repellents, cleaning solutions
d)	Uncooked food, tea leaves	Old crockery, frying pans	Coffee and tea powder, garden waste

59. Waste management is essential in today's society. Due to an increase in population, the generation of waste is getting doubled day by day. Moreover, the increase in waste is affecting the lives of many people.

Waste management is the managing of waste by disposal and recycling of it. Moreover, waste management needs proper techniques keeping in mind the environmental situations. For instance, there are various methods and

techniques by which the waste is disposed of.

You must have come across 5 R's to save the environment: refuse, reduce, reuse, repurpose and recycle.

Effective segregation of wastes at the point of generation is very important. Select the appropriate statements giving the importance of waste segregation

i) less waste goes to the landfills ii) better for public health and the environment iii) help in reducing the waste iv) resulting in deterioration of a waste picker's health

A. both i) and ii)

B. both i) and iii)

C. both ii) and iii)

D. both i) and iv)

Answer: A

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60. Waste management is essential in today's society. Due to an increase in population, the generation of waste is getting doubled day by

day. Moreover, the increase in waste is affecting the lives of many people.

Waste management is the managing of waste by disposal and recycling of it. Moreover, waste management needs proper techniques keeping in mind the environmental situations. For instance, there are various methods and techniques by which the waste is disposed of. You must have come across 5 R's to save the environment: refuse, reduce, reuse, repurpose and recycle.

The given graph shows the amount of waste generated, dumped and treated in percentage.

Identify the reason of low success rate of waste management process.
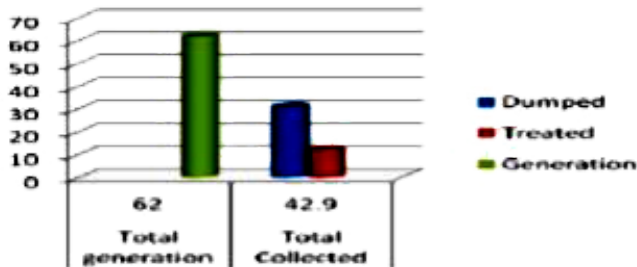
A. only 15% of urban India's waste is processed

B. less than 60% of waste is collected from households

C. more than 60% of waste is collected from households

D. both a and b

Answer: D

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