PHYSICS

BOOKS - CBSE MODEL PAPER

PRACTICE PAPER 2022

Multiple Choice Question

1. Savita has a lamp placed at the centre of her square yard, each side measuring 20 m. The light of lamp covers a circle of radius 10 m on

yard. What area of the yard is NOT lit by the lamp?

A. 400π sq. m

B. 100π sq. m

C. $(40 - 10)\pi$ sq. m

D. $(400 - 100)\pi$ sq. m

Answer: D

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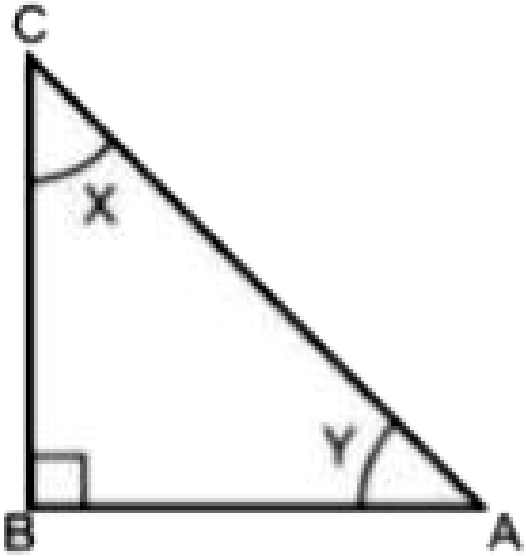
2. In the ΔABC shown below $\angle X : \angle Y = 1:2$



What is tan x ?

A. $\frac{1}{\sqrt{3}}$

B. 1

C. $\frac{\sqrt{3}}{2}$

D. $\sqrt{3}$

Answer: A

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3. Which of the following numbers can be written as a non-terminating but recurring decimal?

A. 9

B. $\frac{43}{8}$

C. $\sqrt{6}$

D. $\frac{5}{12}$

Answer: D

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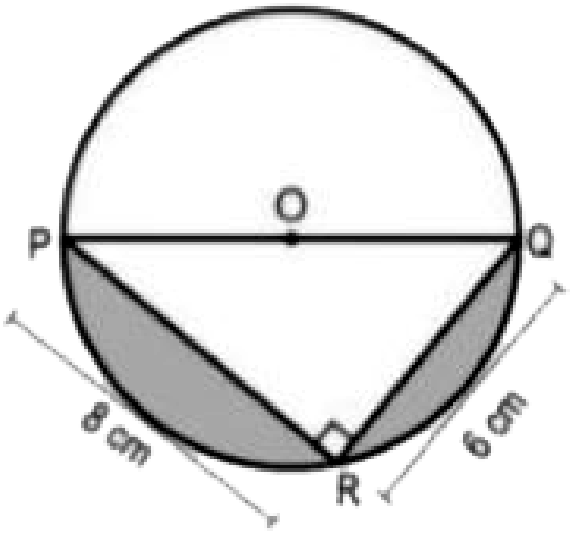
4. In the figure given below, O is the centre of the circle. PR and RQ are chords of the circle. The radius of the circle is 5 cm. PR = 8 cm, QR = 6 cm and $\angle PRQ = 90^\circ$



What is the approximate area of the shaded region ?

A. $\left(\frac{25}{4}\pi - 24\right)cm^2$

B. $\left(\frac{25}{2}\pi - 24\right)cm^2$

C. $\left(\frac{25}{4}\pi\right)cm^2$

D. $\left(\frac{25}{2}\pi\right)cm^2$

Answer: B

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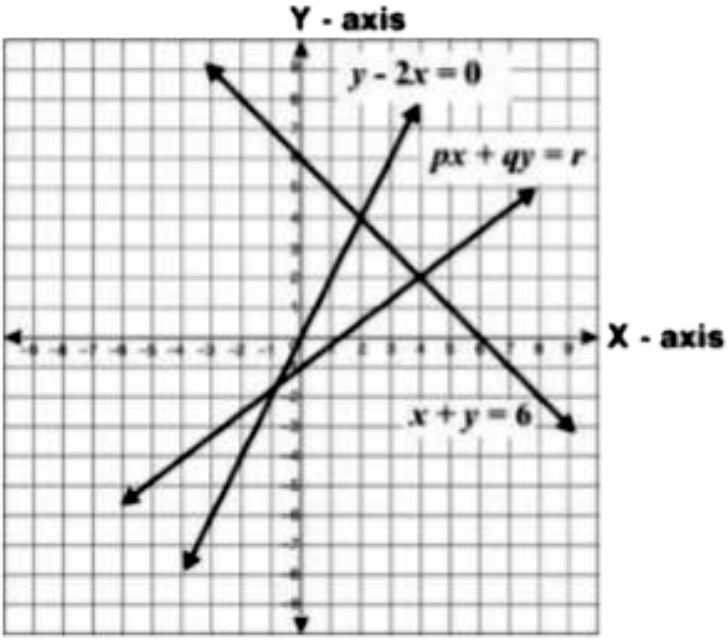
5. Shown below are the graphs of the lines

$y - 2x = 0, x + y = 6$ and $px + qy = r$



Which of these is the solution for the pair of equations $x+y=6$ and $px+qy=r$

A. $x=2, y=4$

B. $x=4, y=2$

C. $x=3, y=2$

D. We cannot say for sure as the values of p and q are not known.

Answer: B

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6. A vessel having $30m^3$ of water is emptied through two openings, one small and the other large. Water flows out through the smaller opening at the rate of U m3/h and through the larger one at the rate of Vm^3/h. Given that 3U + 2V = 70 and that the vessel gets fully emptied in 1 hour, what is V?

A. $10m^3/h$

B. $20m^3/h$

C. $30m^3/h$

D. $50m^3/h$

Answer: B

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7. The sum of the digits of a two-digit number is 9. If 27 is subtracted from the number, then the digits interchange their places. Find the number

A. 8

B. 14

C. 18

D. 20

Answer: C

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8. For the given pair of equations, two statements are given below - one labelled Assertion (A) and the other labelled Reason (R). Read the statements carefully and choose the option that correctly describes statements (A) and (R).

$\frac{2}{x} + 5y = 15$

$\frac{3}{x} + 6y = 7$

Assertion (A): The given pair of equations can be reduced to a pair of linear equations in two variables

Reason (R): In the given equations, y can be substituted by $\frac{1}{p}$

A. Both (A) and (R) are true and (R) is correct explanation of the (A).

B. Both (A) and (R) are true but (R) is not the correct explanation of the (A).

C. (A) is true but (R) is false.

D. (A) is false but (R) is true.

Answer: B

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9. How many zero(es) does (x - 2) (x + 3) have?

A. zero

B. one

C. two

D. three

Answer: C

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10. $\frac{1}{\tan\theta + \cot\theta} =$

A. $\cos\theta \sin\theta$

B. $\sec\theta \sin\theta$

C. $\tan\theta \cot\theta$

D. $\sec\theta \operatorname{cosec}\theta$

Answer: A

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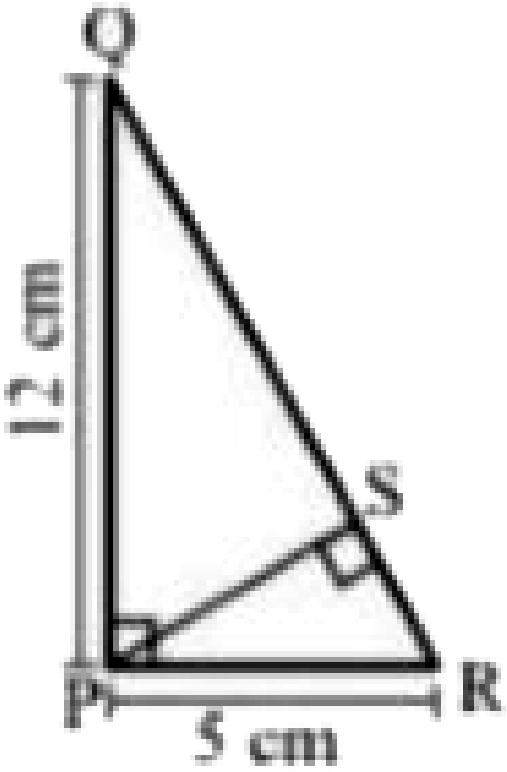
11. In the figure below, PQR is a right-angled triangle, right angled at P. A perpendicular line PS is drawn from P to QR. PR = 5 cm and PQ = 12 cm.



What is RS:SQ?

A. $5:12$

B. $13:17$

C. $13:60$

D. $25:144$

Answer: D

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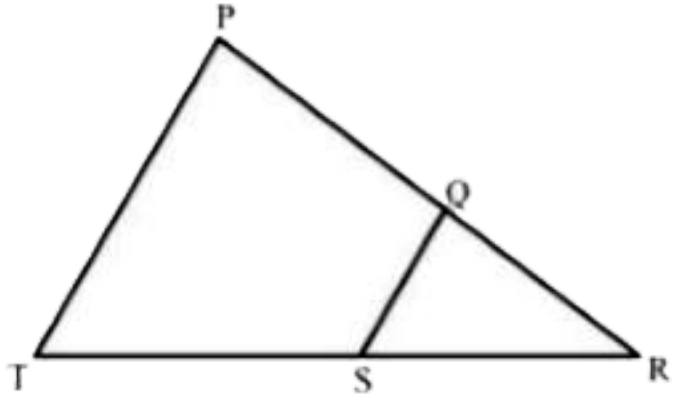
12. In the following figure, Q is a point on PR and S is a point on TR. QS is drawn and $\angle RPT = \angle RQS.$



Which of these criteria can be used to prove that ΔRSQ is similar to ΔRTP?

A. AAA similarity criterion B

B. SAS similarity criterion

C. SSS similarity criterion

D. RHS similarity criterion

Answer: A

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13. Which of these is a RATIONAL number ?

A. 3π

B. $5\sqrt{5}$

C. $0.3466666\ldots\ldots$

D. $0.3452106513728 49\ldots$

Answer: C

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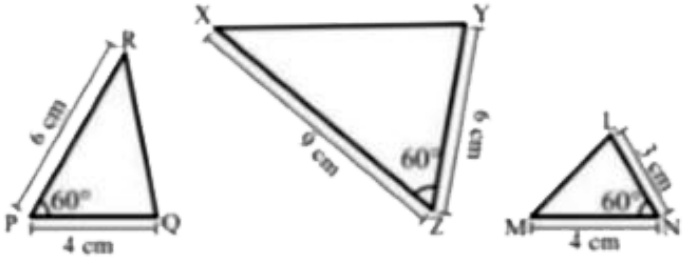
14. Shown below are three triangles. The measures of two adjacent sides and included angle are given for each triangle.



(Note: The figure is not to scale.)

Which of these triangles are similar?

A. ΔRPQ and ΔXZY

B. ΔRPQ and ΔMNL

C. ΔXZY and ΔMNL

D. $\Delta RPQ,$ and ΔXZY are similar to one another

Answer: A

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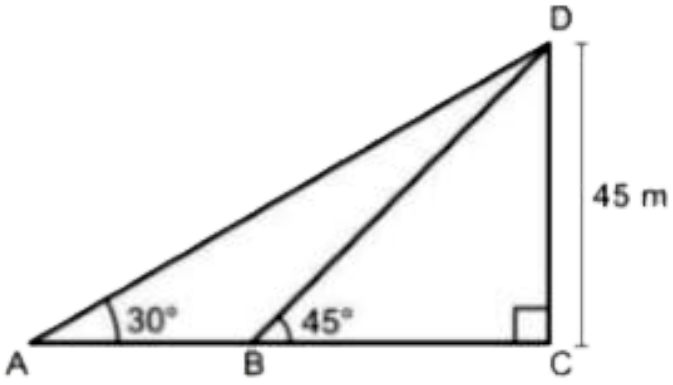
15. In the figure below, what is the length of AB?



(Note: The figure is not to scale.)

A. $45\sqrt{3}m$

B. $\frac{45}{\sqrt{3}}m$

C. $45\left(\sqrt{3}-1\right)m$

D. $45\left(\sqrt{3}+1\right)m$

Answer: C

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16. Which of these is the polynomial whose zeroes are $\frac{1}{3}$ and $\left(\frac{-3}{4}\right)$?

A. $12x^2 + 5x - 3$

B. $12x^2 - 5x - 3$

C. $12x^2 + 13x + 3$

D. $12x^2 + 13x - 3$

Answer: A

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17. Which of these numbers can be expressed as a product of two or more prime numbers ?

(i) 15

(ii) 34568

(iii) (15×13)

A. only (ii)

B. only (iii)

C. only (i) and (ii)

D. all - (i), (ii) and (iii)

Answer: D

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18. Romy is blindfolded and asked to pick one ball from each of the jars

The chance of Romy picking a red ball is same in

A. jars 2 and 3

B. jars 1 and 3

C. jars 1 and 2

D. all the three jars

Answer: C

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19. 1245 is a factor of the numbers p and q. Which of the following will ALWAYS have 1245 as a factor?

(i) p + q

(ii) p $\times$ q

(iii) $p \div q$

A. only (ii)

B. only (i) and (ii)

C. only (ii) and (iii)

D. all - (i), (ii) and (iii)

Answer: B

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20. Look at the numbers shown below.

(i)	-0.5	(ii)	0.00001	(iii)	$\frac{1}{2}$
(iv)	1	(v)	1.00001	(vi)	99%

Which of the above numbers represent probabilities of events?

A. only (i) and (iii)

B. only (i), (ii), (iii) and (iv)

C. only (ii), (iii), (iv) and (v)

D. only (ii), (iii), (iv) and (vi)

Answer: D

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21. A fire engine, standing near a building, extends its ladder to a length of 10 metres to reach a certain window in the building.

(Note: The figure is not to scale.)

What is the height of the window from the ground?

A. 6 m

B. 8 m

C. 9 m

D. 11 m

Answer: D

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22. Two statements are given below - one labelled Assertion (A) and the other labelled Reason (R). Read the statements carefully and

choose the option that correctly describes statements (A) and (R).

Assertion (A): $9x + 12y - 7 = 0$ and $6x + 8y - 14 = 0$ form a consistent pair of linear equations.

Assertion (A): $9x + 12y - 7 = 0$ and $6x + 8y - 14 = 0$ form a consistent pair of linear equations. $\frac{p}{f} = \frac{q}{g} \neq \frac{r}{h}$

A. Both (A) and (R) are true and (R) is the correct explanation of the (A).

B. Both (A) and (R) are true but (R) is not the correct explanation of the (A).

C. (A) is true but (R) is false

D. (A) is false but (R) is true.

Answer: D

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23. Two identical fair dice have numbers 1 to 6 written on their faces. Both are tossed

simultaneously. What is the probability that the product of the numbers that turn up is 12?

A. $\frac{1}{36}$

B. $\frac{1}{9}$

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

D. $\frac{1}{3}$

Answer: B

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24. How many zero(es) does the polynomial $293x^2 - 293x$ have ?

A. 0

B. 1

C. 2

D. 3

Answer: C

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25. What is the value of p if

$$\frac{p}{2} + 3q = 6 \text{ and } 2p - 2q = 10?$$

A. 1

B. 4

C. 6

D. 16

Answer: A

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26. What is the value of k such that the following pair of equations have infinitely many solutions?

$x - 2y = 3$

$-3x + ky = -9$

A. (-6)

B. (-3)

C. 3

D. 6

Answer: D

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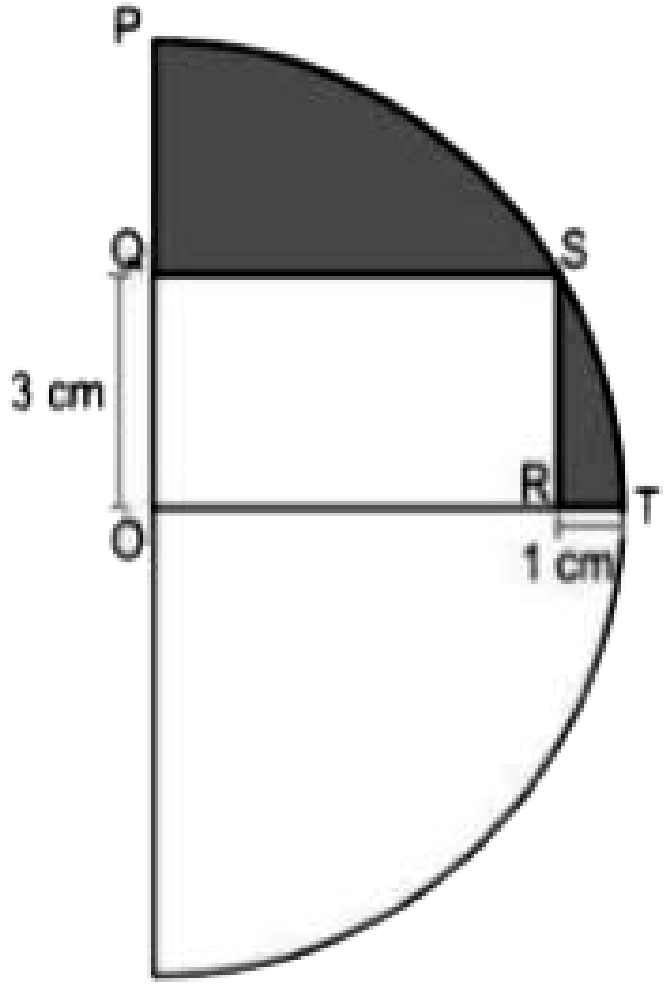
27. In the figure below RT = 1 cm , QS = 4cm and

OQ = 3 cm.



What is the area of the shaded region?

A. $(12.5\pi - 12)cm^2$

B. $(6.25\pi - 12)cm^2$

C. $(12.5\pi - 15)cm^2$

D. $(6.25\pi - 15)cm^2$

Answer: B

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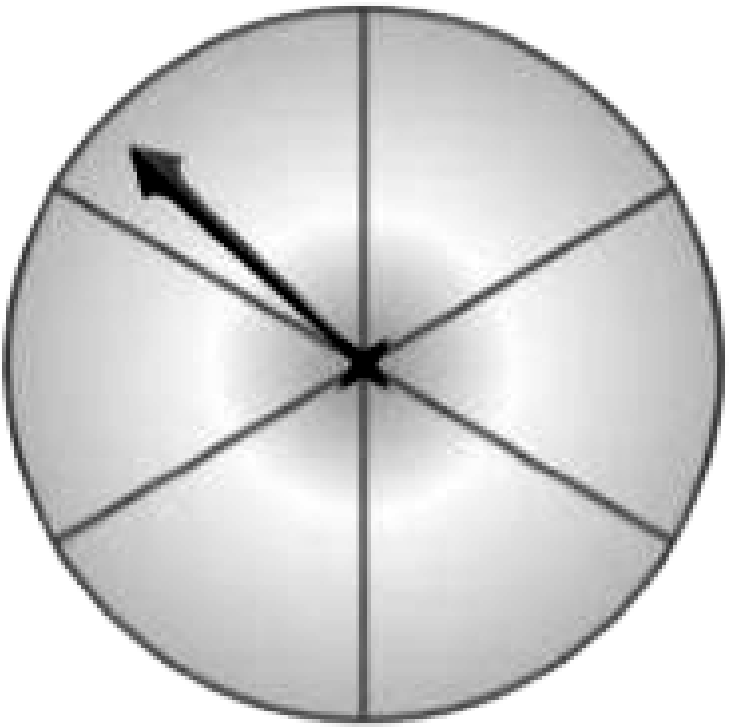
28. Shown below is a board divided into 6 identical sectors, with a pointer that can be spin on it.



When the pointer is spin, it spins for some time and comes to a stop on a sector. The chances of it stopping on any sector are equal. Arif wants to colour some sectors green. How many sectors should he colour green so that

the probability of the pointer stopping on a green sector is 1/3?

A. 1

B. 2

C. 3

D. 4

Answer: B

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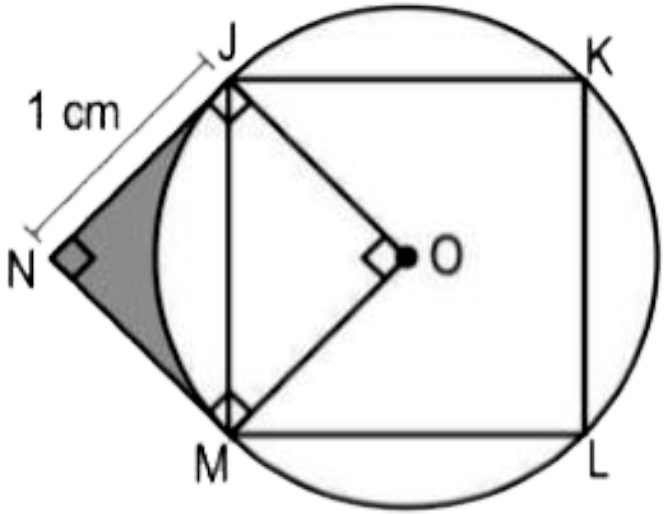
29. In the figure below, the square JKLM is inscribed within a circle and ΔJMN is a right-angled isosceles triangle. The point marked O is the centre of the circle.



What is the area of the shaded part of the figure?

A. $\left(\frac{\pi}{4}-\frac{1}{2}\right)cm^2$

B. $\left(\pi-\frac{1}{2}\right)cm^2$

C. $\left(1-\frac{\pi}{4}\right)cm^2$

D. $(1-\pi)cm^2$

Answer: C

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30. α is an acute angle.

$(\sin\alpha+\cos\alpha)$ is

A. greater than 1.

B. less than 1.

C. equal to 1.

D. (We cannot say any of these as it depends on the value of α)

Answer: A

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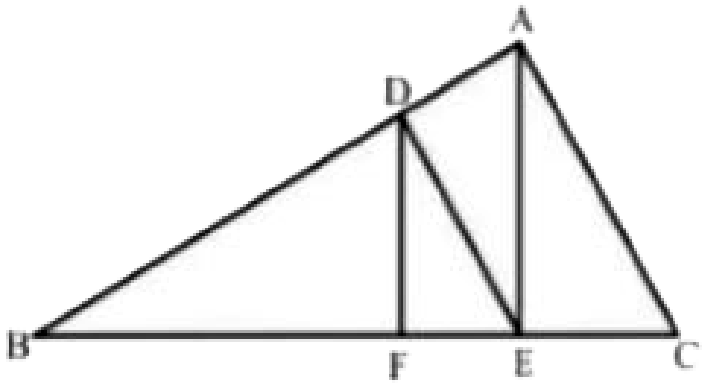
31. In the figure below, DE || AC and DF || AE. Which of these is equal to $\frac{BF}{FE}$?



A. $\frac{DF}{AE}$

B. $\frac{BE}{BC}$

C. $\frac{BA}{AC}$

D. $\frac{FE}{EC}$

Answer: B

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32. x -axis divides the join of (2, -3) and (5, 6) in the ratio _____.

A. $1:2$

B. $2:1$

C. $2:5$

D. $5:2$

Answer: A

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33. A number of the form 8^n , where n is a natural number greater than 1, cannot be divisible by _____.

A. 1

B. 40

C. 64

D. 2^{2n}

Answer: B

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34. The fraction $\frac{7}{q}$ has a terminating decimal expansion. Which of these CANNOT be q?

A. 8×2

B. 8×3

C. 8×4

D. 8×5

Answer: B

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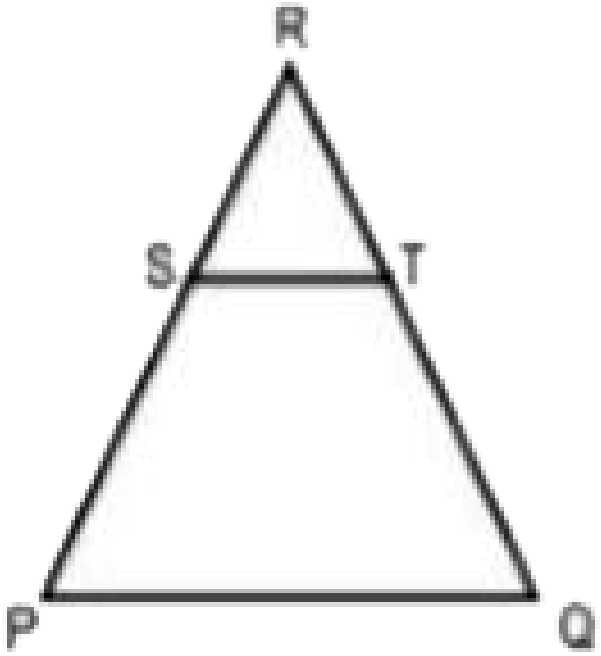
35. In the triangle PQR below, - S and T are 2 points on the sides RP and RQ respectively such that ST is parallel to PQ.

- The ratio of RT to TQ is 1:2.

The area of ΔRST = 100 sq. units.



What is the area of PQTS?

A. 200 sq. units

B. 300 sq. units

C. 600 sq. units

D. 800 sq. units

Answer: D

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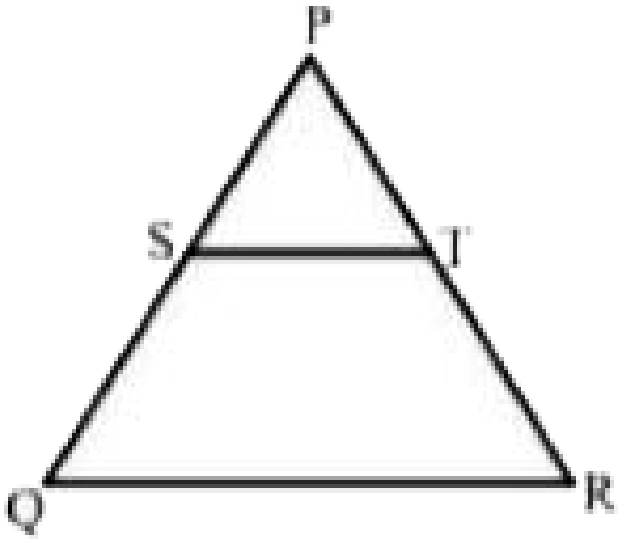
36. In the following figure, ST || QR, point S divides PQ in the ratio 4:5. If ST = 1.6 cm, what

is the length of QR?



A. 0.71 cm

B. 2 cm

C. 3.6 cm

D. (cannot be calculated from the given data.)

Answer: C

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37. P and Q are two positive integers such that $P = p^3q$? and Q =$(pq)^2$, where p and q are prime numbers.

What is LCM(P, Q)?

A. pq

B. p^2q^2

C. p^3q^2

D. p^5q^3

Answer: C

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38. Given that $\cos^2\theta - \sin^2\theta = \frac{3}{4}$ What is the value of cos θ ?

A. $\frac{\sqrt{3}}{2}$

B. $\frac{1}{2}$

C. $\frac{\sqrt{7}}{2}$

D. $\frac{\sqrt{7}}{\sqrt{8}}$

Answer: D

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39. p and q are the zeroes of the polynomial $4y^2 - 4y + 1$. What is the value of $\frac{1}{p} + \frac{1}{q} + pq$?

A. $\frac{-15}{4}$

B. $\frac{-3}{4}$

C. $\frac{5}{4}$

D. $\frac{17}{4}$

Answer: D

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40. Which of the following will have the MAXIMUM number of 6's when written in decimal form?

A. $\frac{666}{1000}$

B. $\frac{3}{6}$

C. $\frac{3}{5}$

D. $\frac{2}{3}$

Answer: D

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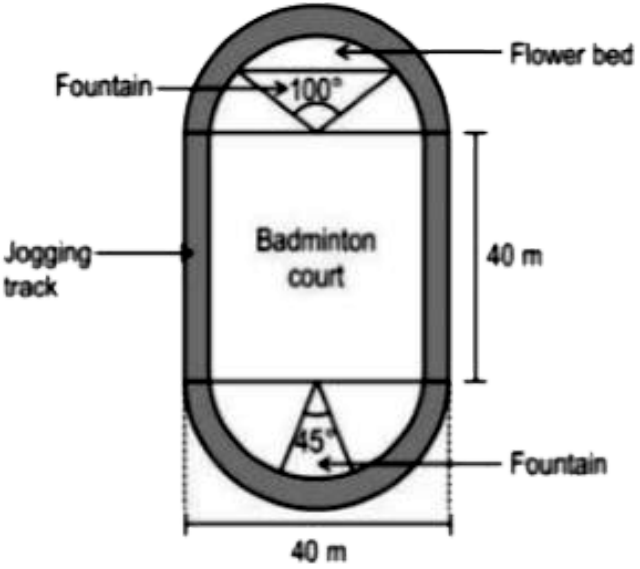
41. Shown below is the top view of a stadium. There is a badminton court at the centre. The stadium is surrounded by a jogging track. The

track is semi-circular in shape at the top and the bottom of the court. The fountains converge at the centre of the respective semicircles. The jogging track has a uniform width of 2 m.



(Note: The figure is not to scale.)
(Note: Use π = 3.14)

What is the area of the jogging track?

A. $160m^2$

B. $172.56m^2$

C. $238.64m^2$

D. $398.64m^2$

Answer: D

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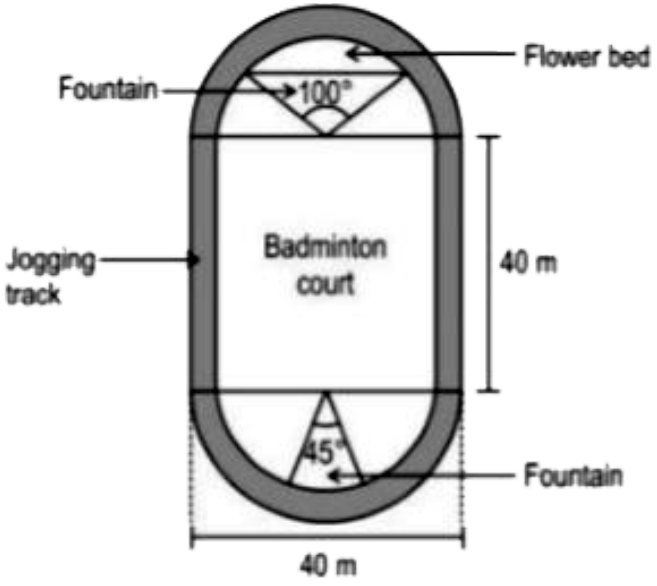
42. Shown below is the top view of a stadium. There is a badminton court at the centre. The stadium is surrounded by a jogging track. The

track is semi-circular in shape at the top and the bottom of the court. The fountains converge at the centre of the respective semicircles. The jogging track has a uniform width of 2 m.



(Note: The figure is not to scale.)
(Note: Use π = 3.14)

What is the area occupied by the fountain shown below the court in the figure?

A. $63.59m^2$

B. $127.17m^2$

C. $157m^2$

D. $282.6m^2$

Answer: B

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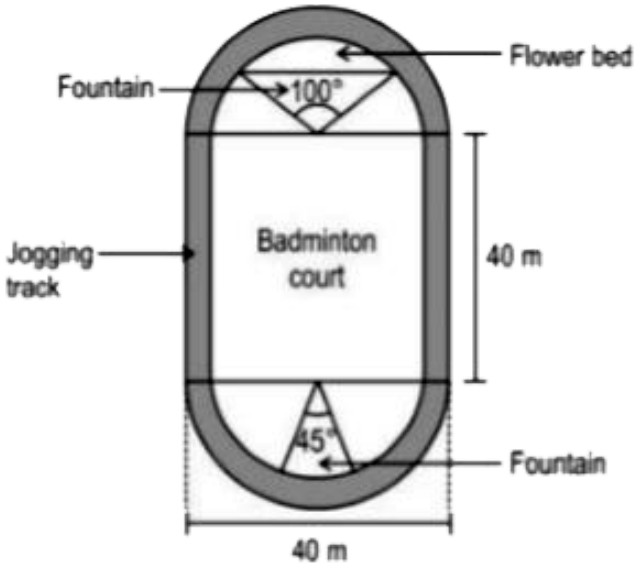
43. Shown below is the top view of a stadium. There is a badminton court at the centre. The stadium is surrounded by a jogging track. The track is semi-circular in shape at the top and the bottom of the court. The fountains converge at the centre of the respective semicircles. The jogging track has a uniform width of 2 m.



(Note: The figure is not to scale.)
(Note: Use π = 3.14)

The cost of gardening is Rs 300/m^2 and the area of the fountain next to the flower bed is 150 m^2.

What is the cost of gardening the flower bed?

A. Rs 39780

B. Rs 45000

C. Rs 59664

D. Rs 84780

Answer: A

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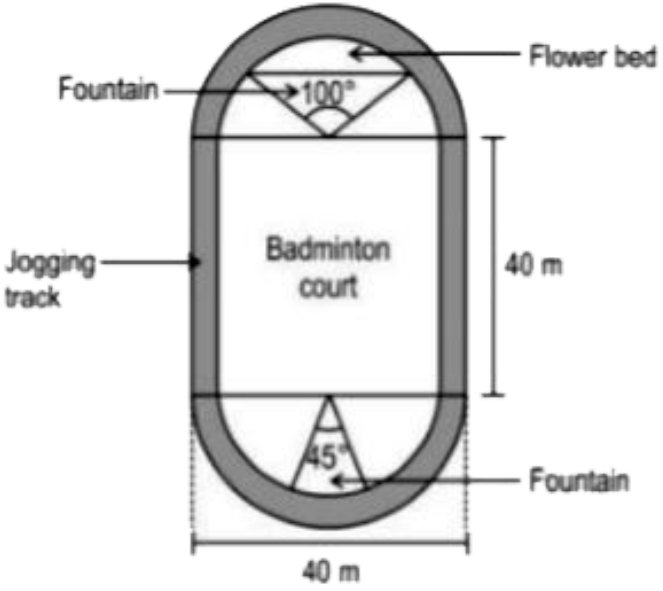
44. Shown below is the top view of a stadium. There is a badminton court at the centre. The stadium is surrounded by a jogging track. The track is semi-circular in shape at the top and

the bottom of the court. The fountains converge at the centre of the respective semicircles. The jogging track has a uniform width of 2 m.



(Note: The figure is not to scale.)
(Note: Use π = 3.14)

If the rate of fencing is Rs 150/m, what is the

cost of fencing the flower bed ONLY on the curved portion of its boundary?

A. Rs 2355

B. Rs 4710

C. Rs 5233

D. Rs 10110

Answer: B

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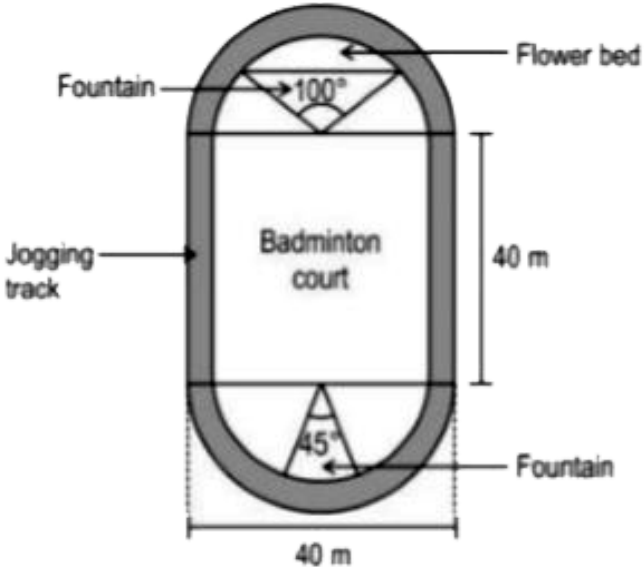
45. Shown below is the top view of a stadium. There is a badminton court at the centre. The stadium is surrounded by a jogging track. The track is semi-circular in shape at the top and the bottom of the court. The fountains converge at the centre of the respective semicircles. The jogging track has a uniform width of 2 m.



(Note: The figure is not to scale.)
(Note: Use π = 3.14)

What is the length of the boundary of the stadium?

A. 62.8 m

B. 125.6 m

C. 160 m

D. 205.6 m

Answer: D

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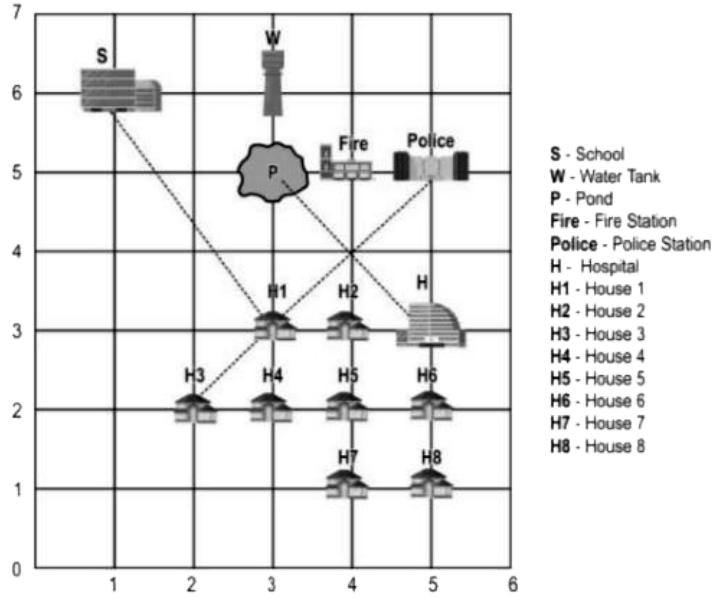
46. Shown below is a town plan on a coordinate grid, where 1 unit = 1 km. Consider the co-ordinates of each building to be the point of intersection of the respective grid lines.



Which of the following pairs of houses has the same abscissa (or x-coordinate)?

A. House 5 and House 6

B. House 5 and House 7

C. House 5 and House 8

D. House 5 and House 1

Answer: B

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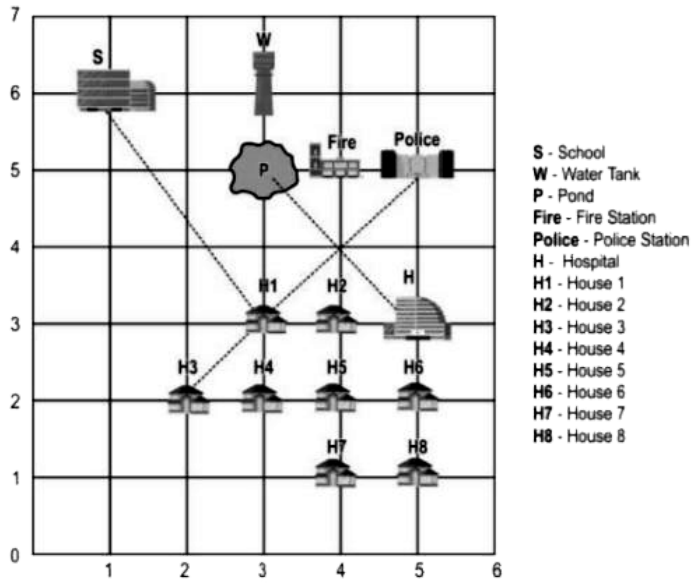
47. Shown below is a town plan on a coordinate grid, where 1 unit = 1 km. Consider the co-ordinates of each building to be the point of intersection of the respective grid lines.



What is the distance between the school and House 1 along the path shown?

A. $\sqrt{13}$ km

B. $\sqrt{97}$ km

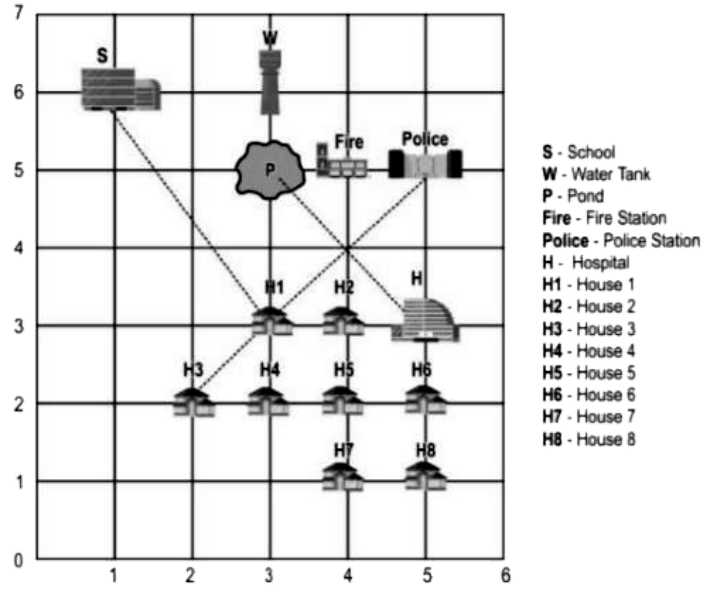
C. 13 km

D. 97 km

Answer: A

Watch Video Solution

48. Shown below is a town plan on a coordinate grid, where 1 unit = 1 km. Consider the co-ordinates of each building to be the point of intersection of the respective grid lines.



A well is dug at a point along the path joining the pond and the hospital. The ratio of the distance between the pond and the well to that of the well and the hospital is 4:1 respectively.

What is the x-coordinate of the well?

A. 3.4

B. 4.25

C. 4.6

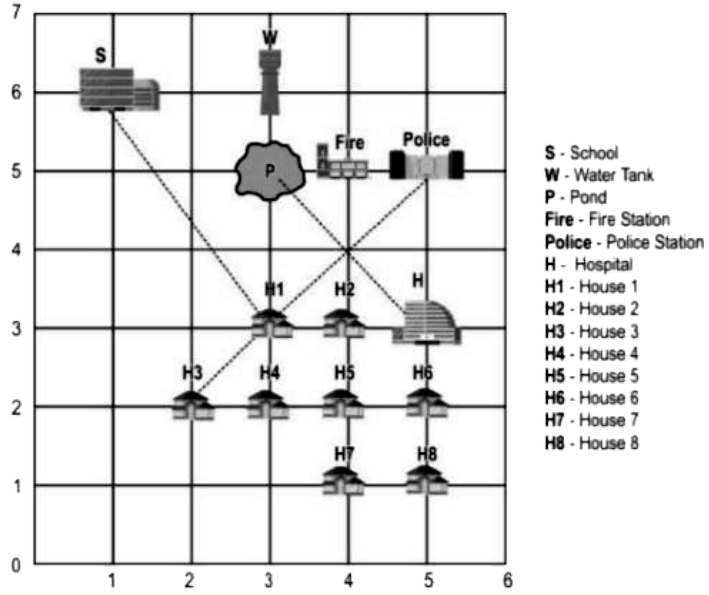
D. 5.75

Answer: C

Watch Video Solution

49. Shown below is a town plan on a coordinate grid, where 1 unit = 1 km. Consider the co-ordinates of each building to be the

point of intersection of the respective grid lines.



What is the ratio in which House 1 divides the path joining House 3 and the Police station?

A. $1:2\sqrt{2}$

B. $1:\sqrt{2}$

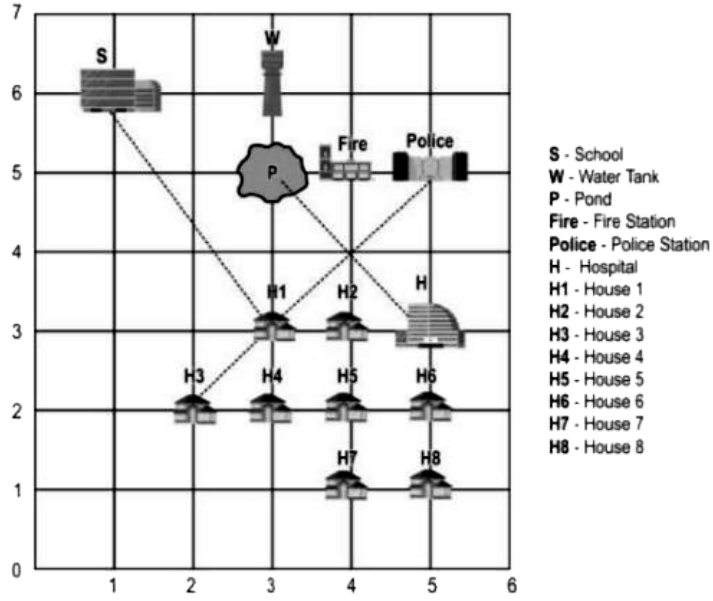
C. $1:3$

D. $1:2$

Answer: D

Watch Video Solution

50. Shown below is a town plan on a coordinate grid, where 1 unit = 1 km. Consider the co-ordinates of each building to be the point of intersection of the respective grid lines.



Which of the following pair of buildings are separated by the same distance as that of School and Police station?

A. Pond and House 8

B. School and House 1

C. Water tank and House 3

D. Fire station and House 3

Answer: C

Watch Video Solution

Multiple Choice Questions

1. Some reactions require conditions like specific temperature, pressure, etc. While writing chemical equations for such reactions,

where are these conditions usually mentioned?

A. above the arrow

B. along with products

C. below the plus signs

D. before the reactants

Answer: A

Watch Video Solution

2. Given here is the equation of a chemical reaction. magnesium + oxygen ---------- > magnesium oxide Which of the following can be said about the equation?

A. Only the products are written on the left side of the equation.

B. Only the reactants are written on the left side of the equation.

C. Both the reactants and the products are written on the left side of the equation.

D. Both the reactants and the products are written on the right side of the equation.

Answer: B

Watch Video Solution

3. Listed here is the reactivity of certain metals.

Metal	Reaction with air	Reaction with water	Reaction with dilute acids
Gold	Does not oxidize or burn	No reaction	No reaction
Sodium	Burns vigorously to form oxide	Violent reaction	Violent reaction
Zinc	Burns to form oxides	Reacts on heating with water	Reacts to produce hydrogen.
Platinum	Does not oxidize or burn	No reaction	No reaction

Which of the above metals are likely to be obtained in their pure states from the Earth's crust?

A. gold only

B. sodium only

C. gold and platinum

D. zinc and sodium

Answer: C

Watch Video Solution

4. Chemical equations are balanced to reflect that _____

A. matter can change its state during chemical reactions

B. matter cannot be created or destroyed during chemical reactions

C. heat is an important input in chemical reactions

D. all chemical reactions are always reversible

Answer: B

Watch Video Solution

5. Which of the following reactions is a neutralisation reaction?

A. $4Na + O_2 \rightarrow 2Na_2O$

B. $Fe + 2HCl \rightarrow FeCl_2 + H_2$

C. $MgO + H_2O \rightarrow Mg(OH)_2$

D. $HNO_3 + NaOH \rightarrow NaNO_3 + H_2O$

Answer: D

Watch Video Solution

6. Which of the following is TRUE about a combination reaction?

A. The number of reactants is always greater than the number of products.

B. The number of products is always greater than the number of reactants

C. The number of products is always equal to the number of reactants.

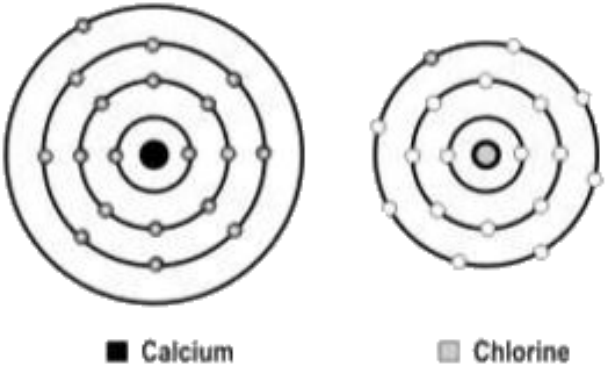
D. (Any of the above can be true for different reactions.)

Answer: A

Watch Video Solution

7. A scientist is attempting to represent an ionic bond between calcium and chlorine. The figure below shows the progress he has made

so far.



What should be the next step in this representation of the ionic bond?

A. Transfer an electron from the calcium atom to the chlorine atom.

B. Transfer an electron from the chlorine atom to the calcium atom.

C. Add another chlorine atom to accept an electron from the calcium atom.

D. Add another calcium atom to donate an electron to the chlorine atom.

Answer: C

 Watch Video Solution

8. In which of the following forms do electrovalent compounds conduct electricity?

A. only in solid form

B. both in solid form and in aqueous solution

C. both in aqueous solution and in molten form

D. in solid form, molten form and in aqueous solution

Answer: C

Watch Video Solution

9. Sodium comes after potassium in the reactivity series, so sodium is _____

A. not reactive

B. more reactive than potassium

C. equally reactive as potassium

D. less reactive than potassium

Answer: D

 Watch Video Solution

10. Which of the following are properties of acids?

P. They are bitter in taste.

Q. They react with metals to produce hydrogen gas.

R. They are easily soluble in water.

A. only P

B. only P and R

C. only Q and R

D. all - P, Q and R

Answer: C

Watch Video Solution

11. Organisms break down large food molecules to small molecules. How does this breakdown help the organisms?

A. It releases a lot of energy in the digestive tract that can be used up by the cells.

B. It ensures that there are enough raw materials to produce and supply oxygen

to the cells.

C. It converts the large molecules to small molecules that can pass through the cell membrane.

D. It makes sure that the liberation of heat by the breakdown of large molecules does not occur inside the cell.

Answer: C

 Watch Video Solution

12. The liver secretes bile, needed to digest fats in our food. The pancreas secretes several enzymes needed to break down food.

Which of the following is true of the food that we eat?

A. It passes only through our liver.

B. It passes only through our pancreas

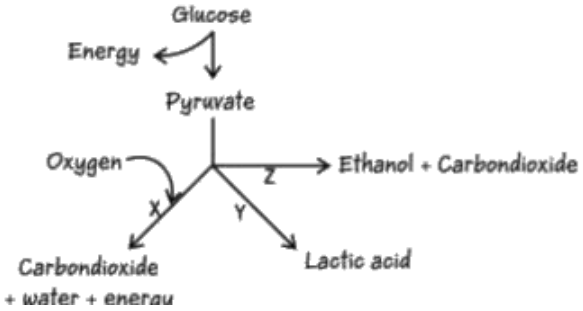
C. It passes through both our liver and pancreas.

D. It passes neither through our liver nor pancreas.

Answer: D

Watch Video Solution

13. Which of the following occurs during oxygen shortage in muscle cells?



A. only X

B. only Y

C. only Z

D. any of them - X, Y or Z

Answer: B

Watch Video Solution

14. Which of the following plays the important role of creating a suction force which pulls

water upwards from the roots of a tree to its leaves?

A. gravitation

B. respiration

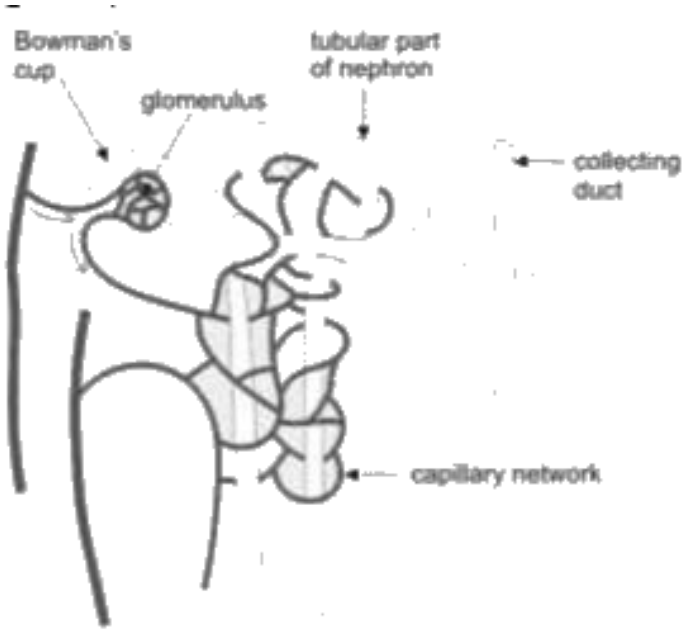
C. transpiration

D. photosynthesis

Answer: C

Watch Video Solution

15. Observe the image of a single nephron.



The amount of liquid passing through in the form of glomerular filtrate is approximately 150- 180 litres per day whereas the amount of urine flowing out of all the nephrons is only 1.5 to 1.8 litres per day.

Water is getting reabsorbed.

In which part of the nephron could the water be getting reabsorbed?

A. in the Bowman's cup

B. in the long tubular part

C. in the collecting duct

D. in the glomerulus

Answer: B

Watch Video Solution

16. During transpiration, water is lost in the form of water vapour through ___

A. xylem

B. phloem

C. stomata

D. root hair

Answer: C

Watch Video Solution

17. Which of the following characteristics of a spherical mirror is given by the ratio of the size of the image to the size of the object?

A. aperture

B. magnification

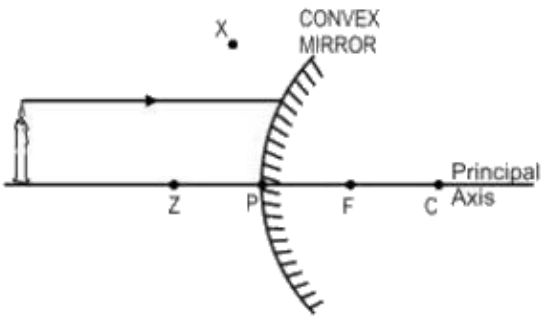
C. focal length

D. radius of curvature

Answer: B

Watch Video Solution

18. In the diagram shown below, a light ray is incident on a convex mirror.



Through which point will the ray travel after reflecting off the mirror?

A. C

B. F

C. X

D. Z

Answer: C

 Watch Video Solution

19. As a ray of light entered medium P from medium Q, its velocity increased. What can be said about the refractive index of medium P as compared to that of the medium Q?

A. It is lower

B. It is higher

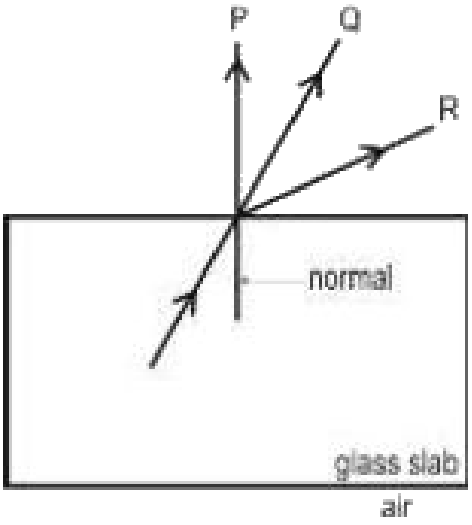
C. It is the same

D. Nothing can be said without knowing what medium P and medium Q are.

Answer: A

 Watch Video Solution

20. In the diagram shown below, a beam of light is travelling from inside a glass slab to air. Which of the marked paths will the ray of light take as it emerges from the glass slab?



A. P

B. Q

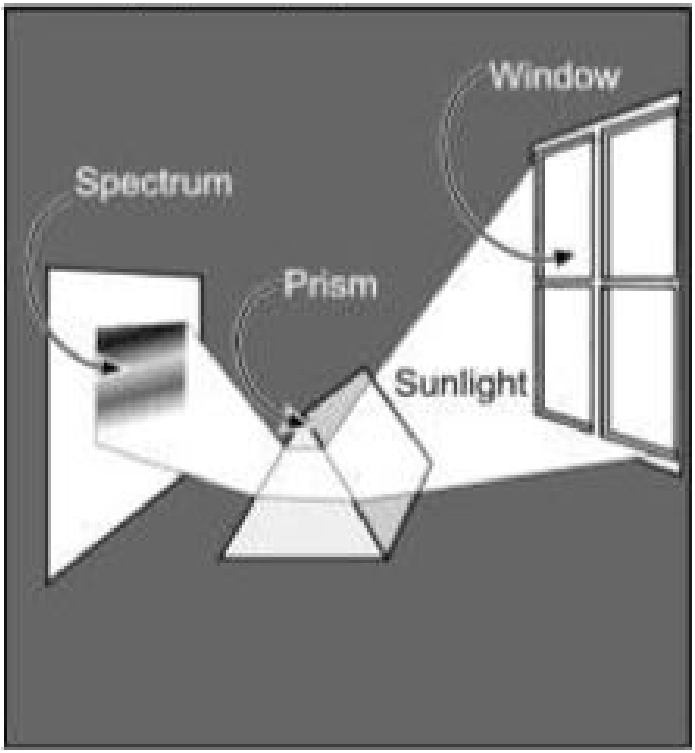
C. R

D. None of them as light splits into its many colours.

Answer: C

Watch Video Solution

21. The image below depicts light being split by a prism into different colours.



This was first observed by Isaac Newton. What would this observation help us to understand?

A. the cause for sunspots

B. how X-rays are formed

C. the cause for rainbows

D. how the Sun produces light

Answer: C

Watch Video Solution

22. An object was placed at the centre of curvature of a concave lens. The image formed by the lens would be _____

A. virtual, erect and same size as the object

B. virtual, erect and smaller than the object

C. real, inverted and larger than the object

D. real, inverted and same size as the object

Answer: B

Watch Video Solution

23. The Sun appears red during sunset because _____

A. of the refraction of the sunlight by the atmosphere

B. the intensity of light reaching the Earth decreases in the evening

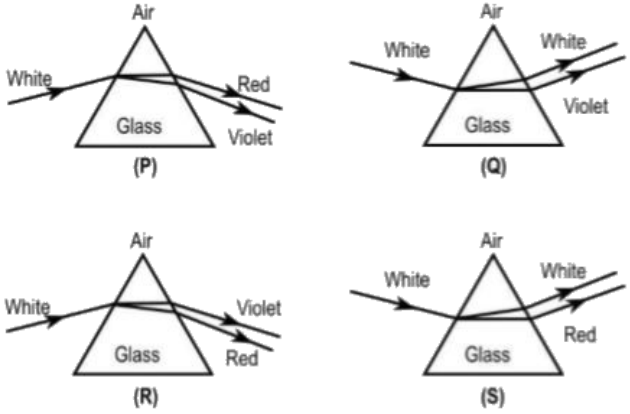
C. most of the blue light is scattered away by the atmospheric particles near the horizon

D. light is scattered to a greater extent in the evening due to a slight decrease in temperature

Answer: C

Watch Video Solution

24. The path of light rays passing through a glass prism is BEST represented by _____



A. only P

B. only R

C. either Q or S

D. either P or R

Answer: A

Watch Video Solution

25. $wSnO_2 + xH_2 \rightarrow ySn + zH_2O$

For which of the following values of w, x, y and z will the equation above be balanced?

A. w=1, x=1, y=1, z=1

B. w=1, x=2, y=2, z=1

C. w=1, x=2, y=1, z=2

D. w=1, x=1, y=1, z=2

Answer: C

Watch Video Solution

26. A solution of an acid with pH 5.1 is given. Which of the following can be done to increase its pH?

i. add distilled water to it

ii. add a solution of a different acid with pH 5.8

iii. add few drops of a base with an unknown pH

A. only i

B. only iii

C. only i and ii

D. any of i, ii and iii

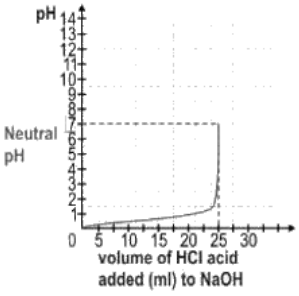
Answer: D

Watch Video Solution

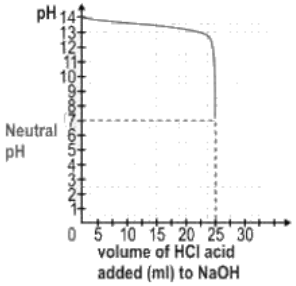
27. Aditi adds dropwise 25 ml of concentrated HCl to 25 ml of concentrated NaOH and continuously monitors the pH in the mixture. She finds that the pH of the mixture at the end of the experiment is 7.

Which of the following graph correctly demonstrates the change in pH in the mixture

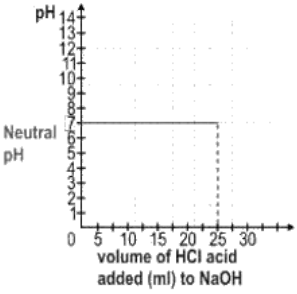
during the experiment?



P.



Q.



R.

A. only P

B. only Q

C. either P or Q

D. any of them - P, Q or R

Answer: B

Watch Video Solution

28. Anand took four colourless solutions P, Q, R and S, and performed the following tests. What is the definite conclusion that Anand can reach?

	Solution P	Solution Q	Solution R	Solution S
With methyl orange	No change in colour	Turns red	No change in colour	No change in colour
With phenolphthalein	No change in colour	No change in colour	No change in colour	Turns pink
With red litmus	No change in colour	No change in colour	No change in colour	Turns litmus blue
With blue litmus	No change in colour	Turns litmus red	No change in colour	No change in colour

A. Both P and S are salt solutions.

B. Both Q and S are basic solutions.

C. Both Q and R are salt solutions.

D. Both P and R are neutral solutions

Answer: D

Watch Video Solution

29. Some activities cause the soil and water resources in that area to become acidic. Once these activities are stopped, the land has to be

treated to enable plants to grow once again. Which of the following should be added to the land to decrease the acidity permanently and allow plants to grow once again?

A. Water which is neutral.

B. Calcium oxide which is basic.

C. Sodium chloride which is neutral.

D. Dilute hydrochloric acid solution.

Answer: B

Watch Video Solution

30. Shown below is a container that is used in the transportation of goods over long distances

These containers are made of steel. Which property of steel is mainly used to make these containers?

A. its ductility

B. its malleability

C. its metallic lustre

D. its electrical conductivity

Answer: B

Watch Video Solution

31. Payal has to arrange the following in DECREASING order of hydroxide ion concentration. wine (pH 4.0), milk of magnesia

(pH 10.5), blood (pH 7.4) Which of the following arrangements is correct?

A. wine - > milk of magnesia - > blood

B. blood - > milk of magnesia - > wine

C. milk of magnesia - > blood - > wine

D. wine - > blood - > milk of magnesia

Answer: C

Watch Video Solution

32. A piece of zinc (Zn) - a reactive metal - was dropped into a test tube containing a substance. A zinc salt was formed and hydrogen gas was liberated. This is shown in the equation below.

$Zn +$ _ _ _ _ _ _ _ _ _ $>$ zinc salt $+ H_2$ gas

Which of the following can be the substance that zinc was dropped into?

P) water

Q) hydrochloric acid

R) a solution of a zinc salt

A. only P

B. only Q

C. only R

D. either P or R

Answer: B

Watch Video Solution

33. Given below are reactions involving metals P, Q, R and S and their salt solutions in water.

Metal P salt solution $+Q \rightarrow$ Metal Q salt

solution + P

Metal Q salt solution $+R \rightarrow$ Metal R salt solution + Q

Metal S salt solution $+Q \rightarrow$ Metal Q salt solution + S

Metal P salt solution + S $\rightarrow$ No reaction

Which metal is the MOST reactive?

A. P

B. Q

C. R

D. S

Answer: C

Watch Video Solution

34. Two statements are given - one labelled Assertion (A) and the other labelled Reason (R). Assertion: Sodium carbonate is commonly used as an ingredient in antacid tablets. Reason: Sodium carbonate is a basic salt. Which of the following is correct?

A. Both A and R are true, and R is the correct explanation of A

B. Both A and R are true, but R is not the correct explanation of A.

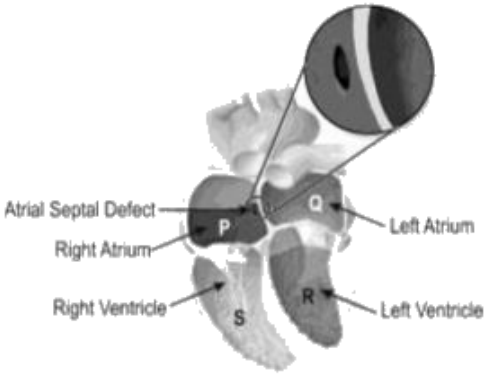
C. A is true, but R is false.

D. A is false, but R is true.

Answer: D

Watch Video Solution

35. Some adults have a defective heart since birth. They are born with a hole between the left atrium and right atrium (shown below), this defect is called the Atrial Septal Defect (ASD). Due to the hole between the atria, oxygenated blood gets mixed with deoxygenated blood. A symptom of this disease is to feel tired easily.



Heart with Atrial Septal Defect

Which of the following is likely to happen in people with ASD in a single cycle of blood flow?

A. The kidneys will filter out more carbon dioxide.

B. The blood will take up more oxygen from the lungs

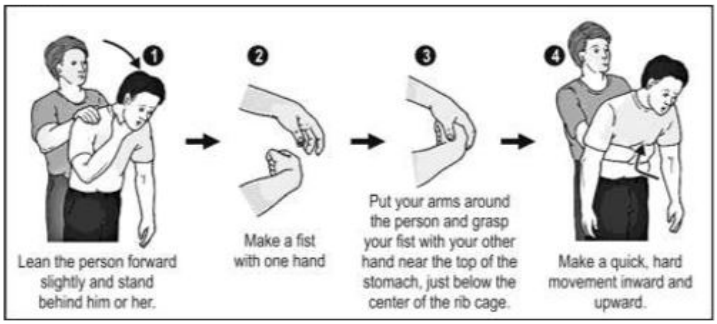
C. The muscles will receive blood containing less oxygen

D. The lungs will receive blood containing more carbon dioxide.

Answer: C

Watch Video Solution

36. A person can choke when a piece of food becomes lodged in the windpipe, blocking the flow of air. A first aid procedure to remove the blockage is the Heimlich manoeuvre described below:



By performing this procedure, the piece of food is pushed out of the windpipe. Which of the following causes this to happen?

A. the expansion of the chest

B. the air pressed out of the lungs

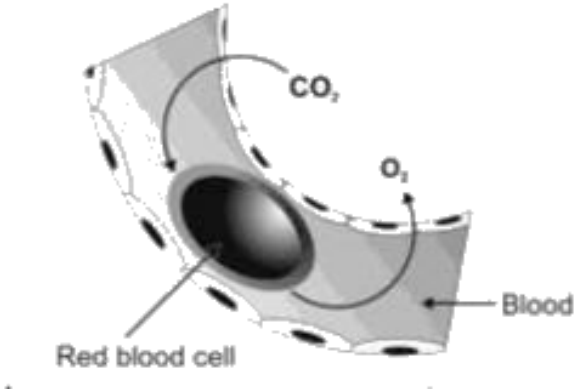
C. the food pressed out of the stomach

D. the upward movement of the wall of the food pipe

Answer: B

 Watch Video Solution

37. Given below is a diagrammatic representation of a process taking place in the human body



In which of these regions/organs could it be occurring?

i. lungs

ii. Heart

iii. Brain

A. only in i

B. only in ii

C. only in i and ii

D. in all - i, ii and iii

Answer: D

Watch Video Solution

38. The diagram below shows a leaf that was covered by piece of black paper for a period of 3 days. After 3 days the paper was removed.

On testing, it was found that the area under the black paper tested negative for starch and the rest tested positive for starch.

What was the experiment trying to test?

A. if plants make their own food

B. if light is required for plants to make food

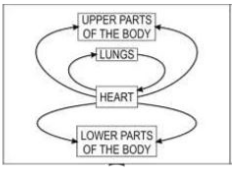
C. if plants can respire in the absence of light

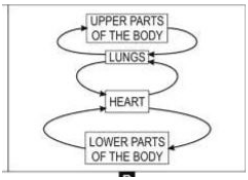
D. if plants can survive even in the absence of light

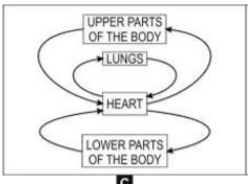
Answer: B

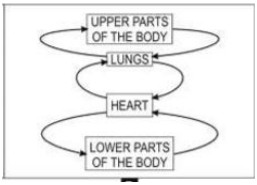
Watch Video Solution

39. Which of these flowcharts correctly shows the circulation of blood in the human body?

A. 

B. 

C. 

D. 

Answer: C

Watch Video Solution

40. Two statements are given - one labelled Assertion (A) and the other labelled Reason (R). Assertion: The rate of breathing in aquatic organisms is much faster than in terrestrial organisms. Reason: The amount of oxygen dissolved in water is much lower than the amount of oxygen in air.

Which of the following is correct?

A. Both A and R are true, and R is the correct explanation of A

B. Both A and R are true, but R is not the correct explanation of A.

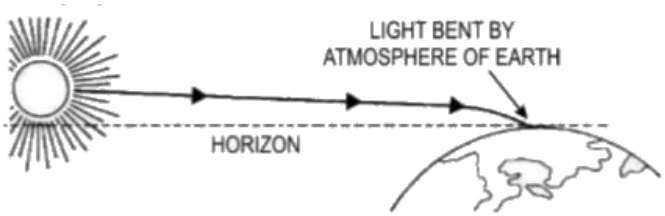
C. A is true, but R is false.

D. A is false, but R is true.

Answer: A

 Watch Video Solution

41. When light from the Sun enters the Earth's atmosphere it gets refracted. This will cause an apparent image of the Sun to appear in the sky due to refraction. The image below shows how light gets bent by the Earth's atmosphere



Which of the following would be an effect of this?

A. The sky appears to be blue in colour.

B. It is much cooler early in the morning and late in the evening.

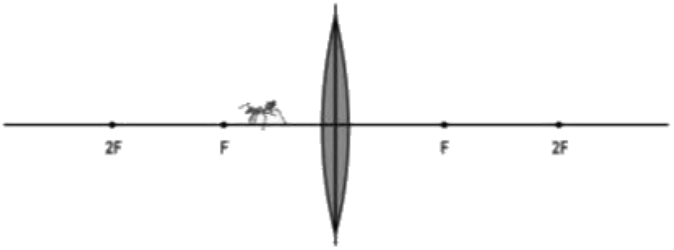
C. At sunrise, the Sun is seen in the sky even though it is still below the horizon.

D. The length of daylight increases during summer and decreases during winter time.

Answer: C

Watch Video Solution

42. An ant was in front of a convex lens as shown below



Which of the following shows the image of the ant observed through the convex lens?

A. 

B. 

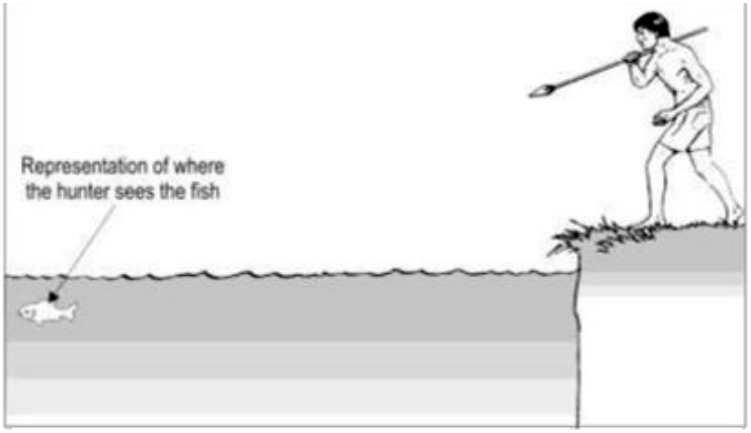
C. 

D.

Answer: C

Watch Video Solution

43. A hunter sees a fish which is swimming in clear water as shown in the figure.



To hit the fish, he should take aim adjusting for the fish's motion and _____

A. exactly at the depth where the fish appears to be

B. a little below where the fish appears to be

C. a little above where the fish appears to be

D. at the fish's eye, exactly where it appears to be

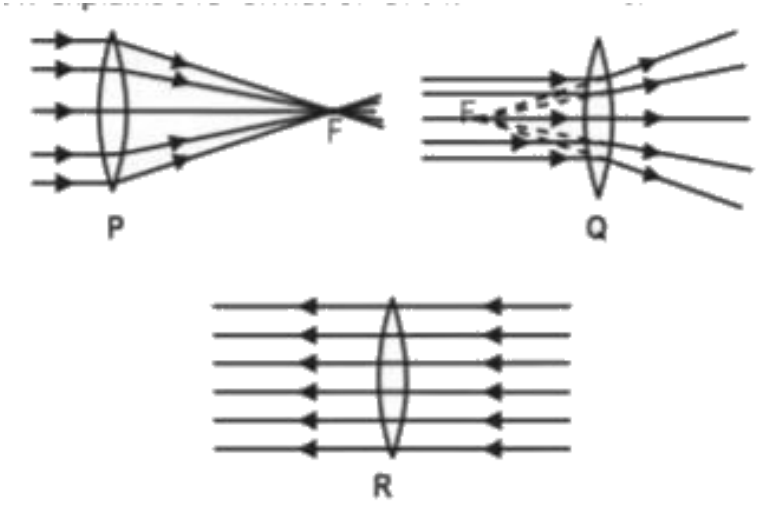
Answer: B

Watch Video Solution

44. Shown below is a photograph of a convex lens.

A small, bright spot is seen on the paper when the lens is kept out facing the sun.

Which diagram below explains the formation of the bright spot?



A. only P

B. only Q

C. only R

D. both P and Q

Answer: A

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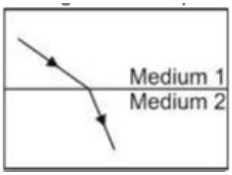
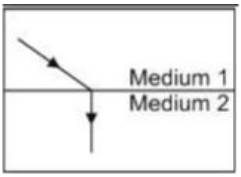
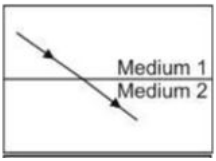
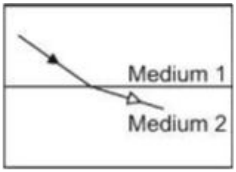
45. A ray of light passes from solid medium 1 into solid medium 2. The refractive index of medium 1 is the same as that of medium 2.

Which of the figures correctly shows the path of the ray of light in the two mediums?

A. 

B. 

C. 

D. 

Answer: C

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46. Two statements are given - one labelled Assertion (A) and the other labelled Reason (R). Read the statements carefully and choose the option that correctly describes statements A and R.

Assertion (A): Stars would not twinkle if we viewed them from the moon.

Reason (R): Stars appear to twinkle due to atmospheric refraction of starlight.

A. Both A and R are true and R is the correct explanation for A.

B. Both A and R are true but R is not the correct explanation for A.

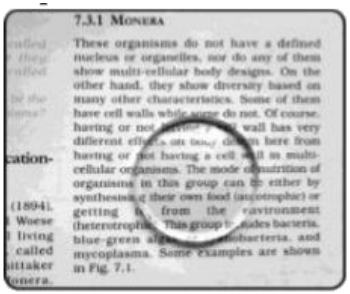
C. A is true but R is false.

D. A is false but R is true.

Answer: A

 Watch Video Solution

47. Rajan takes the following two photographs of the text in a book, first while keeping a circular piece of glass on the book, and then while holding it at some distance above the book.



Photograph 1: A piece of glass on the book


Photograph 2: A piece of glass held at some distance above the book

Which of the following statements is true about the piece of glass?

A. It is a convex lens as the text is not inverted.

B. It is a concave lens as the text is diminished in size.

C. It is a plain glass disc as there is no difference in the text.

D. It cannot be predicted based on the given information.

Answer: B

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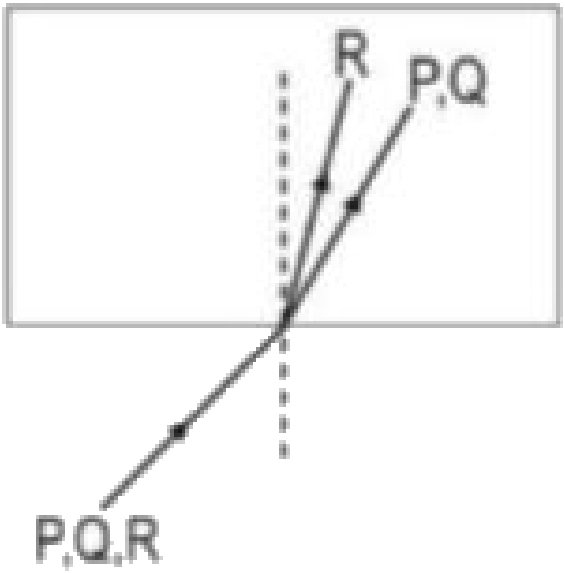
48. A beam of light consisting of three rays - P, Q, R is incident on a transparent plastic block from air as shown in the figure below.



Which of the following statements is true?

A. Refractive index for P is greater than that for Q.

B. Refractive index for P is greater than that for R.

C. Refractive index for R is greater than that for Q

D. Refractive index for P, Q and R is the same.

Answer: C

Watch Video Solution

49. The pH values of many common liquids are given in the table below.

Substance	pH
Battery acid	< 1.0
Stomach acid	2.0
Lemon juice	2.4
Cola	2.5
Apple juice	3.5
Black Coffee	5.0
Black tea	5.5
Acid rain	5.6
Milk	6.5
Distilled water	7.0
Human saliva	7.5
Sea water	8.0
Soap	9.0 - 10.0
Milk of magnesia	10.5
Ammonia	11.5
Bleach	12.5

Study the table and answer the questions that

follow.

Which of these is a neutralisation reaction?

A. mixing sea water and bleach

B. mixing lemon juice and soap

C. mixing milk and black tea

D. mixing cola and distilled water

Answer: B

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50. The pH values of many common liquids are given in the table below.

Substance	pH
Battery acid	< 1.0
Stomach acid	2.0
Lemon juice	2.4
Cola	2.5
Apple juice	3.5
Black Coffee	5.0
Black tea	5.5
Acid rain	5.6
Milk	6.5
Distilled water	7.0
Human saliva	7.5
Sea water	8.0
Soap	9.0 - 10.0
Milk of magnesia	10.5
Ammonia	11.5
Bleach	12.5

Study the table and answer the questions that

follow.

Which of these is a valid conclusion that can be drawn from the table?

A. Many common food items are quite acidic in nature.

B. Our stomach contains a liquid which is a weak acid.

C. Sea water is neither acidic nor basic - it is neutral.

D. Acid rain, in spite of its name, is basic in nature.

Answer: A

Watch Video Solution

51. The pH values of many common liquids are given in the table below.

Substance	pH
Battery acid	< 1.0
Stomach acid	2.0
Lemon juice	2.4

Cola	2.5
Apple juice	3.5
Black Coffee	5.0
Black tea	5.5
Acid rain	5.6
Milk	6.5
Distilled water	7.0
Human saliva	7.5
Sea water	8.0
Soap	9.0 - 10.0
Milk of magnesia	10.5
Ammonia	11.5
Bleach	12.5

Study the table and answer the questions that follow.

Amit has black coffee with milk.

Which of the following is most likely to be true about the pH of the mixture?

A. It will be less than that of black coffee.

B. It will be more than that of distilled water.

C. It will be more than that of acid rain.

D. It will be less than that of apple juice.

Answer: C

 Watch Video Solution

52. The pH values of many common liquids are given in the table below.

Substance	**pH**
Battery acid	< 1.0
Stomach acid	2.0
Lemon juice	2.4
Cola	2.5
Apple juice	3.5
Black Coffee	5.0
Black tea	5.5
Acid rain	5.6
Milk	6.5
Distilled water	7.0
Human saliva	7.5
Sea water	8.0
Soap	9.0 - 10.0

Milk of magnesia	10.5
Ammonia	11.5
Bleach	12.5

Study the table and answer the questions that follow.

Which of the following would be the best for a person suffering from acidity?

A. cola

B. milk

C. black tea

D. milk of magnesia

Answer: D

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53. William Harvey (1578–1657) was one of the early biologists who studied the bodies of humans and animals. He even dissected the bodies and did experiments with the heart and blood vessels. He concluded from his experiments that the blood leaves the heart through the arteries and returns via the veins. However, he could not explain how blood left

the arteries to enter the veins. He said there must be some structure between arteries and veins but he could not find them. Marcello Malphigi (1628–1694) later discovered these structures while studying a dead frog's lungs under a microscope.

Which of the following structures did Malphigi find in the frog?

A. cells

B. capillaries

C. heart chambers

D. small air sacs in lungs

Answer: B

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54. William Harvey (1578–1657) was one of the early biologists who studied the bodies of humans and animals. He even dissected the bodies and did experiments with the heart and blood vessels. He concluded from his experiments that the blood leaves the heart

through the arteries and returns via the veins. However, he could not explain how blood left the arteries to enter the veins. He said there must be some structure between arteries and veins but he could not find them. Marcello Malphigi (1628–1694) later discovered these structures while studying a dead frog's lungs under a microscope.

What is the MOST LIKELY reason why Harvey could NOT find these structures?

A. These structures are not found in humans.

B. These structures are found only in the lungs.

C. These structures become visible only in dead animals

D. These structures were too small to be seen by the naked eye.

Answer: D

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55. William Harvey (1578–1657) was one of the early biologists who studied the bodies of humans and animals. He even dissected the bodies and did experiments with the heart and blood vessels. He concluded from his experiments that the blood leaves the heart through the arteries and returns via the veins. However, he could not explain how blood left the arteries to enter the veins. He said there must be some structure between arteries and veins but he could not find them. Marcello Malphigi (1628–1694) later discovered these

structures while studying a dead frog's lungs under a microscope.

Which of the following statements about arteries and veins is TRUE?

A. Arteries have thicker walls than veins.

B. Veins have thicker walls than arteries.

C. All arteries carry only oxygenated blood.

D. All veins carry only deoxygenated blood.

Answer: A

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56. William Harvey (1578–1657) was one of the early biologists who studied the bodies of humans and animals. He even dissected the bodies and did experiments with the heart and blood vessels. He concluded from his experiments that the blood leaves the heart through the arteries and returns via the veins. However, he could not explain how blood left the arteries to enter the veins. He said there must be some structure between arteries and veins but he could not find them. Marcello

Malphigi (1628–1694) later discovered these structures while studying a dead frog's lungs under a microscope.

Which two chambers of the human heart have arteries connected to them?

A. left atrium and left ventricle

B. right atrium and right ventricle

C. left atrium and right atrium

D. left ventricle and right ventricle

Answer: D

Watch Video Solution

57. Shashank went to the optician to get his eyes checked. He observed that the doctor combined two lenses and put these in front of his eyes so that he could see clearly. The powers of the two lenses used in the combination were -3 D and 4 D.

What type of lens will the combination of lenses be?

A. diverging lens

B. converging lens

C. both converging and diverging since both types of lenses are used

D. either converging or diverging depending on the defect in Shashank's eyes

Answer: B

Watch Video Solution

58. Shashank went to the optician to get his eyes checked. He observed that the doctor combined two lenses and put these in front of his eyes so that he could see clearly. The powers of the two lenses used in the combination were -3 D and 4 D.

Which of these will be the focal length of the combination of lenses Shashank has to wear?

A. $-14cm$

B. $+25cm$

C. $-33cm$

D. $+100cm$

Answer: D

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59. Shashank went to the optician to get his eyes checked. He observed that the doctor combined two lenses and put these in front of his eyes so that he could see clearly. The powers of the two lenses used in the combination were -3 D and 4 D.

Which of the following does the negative sign in the power -3 D signify?

A. The focus is on the same side of the lens as the object.

B. The focus is on the opposite side of the lens as the object.

C. The principal focus is situated outside the principal axis.

D. The focal length on one side of the lens is smaller than that on the other.

Answer: A

Watch Video Solution

60. Shashank went to the optician to get his eyes checked. He observed that the doctor combined two lenses and put these in front of his eyes so that he could see clearly. The powers of the two lenses used in the combination were -3 D and 4 D.

Which of the two lenses can form a real image?

A. only the lens with power -3 D

B. only the lens with power 4 D

C. both the lenses

D. neither of the lenses

Answer: B

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