Previous Year Questions: General Aptitude - 1

Q1: In the 4 x 4 array shown below, each cell of the first three rows has either a cross (X) or a number. (2024 SET 2)

1	X	4	3
X	5	5	4
3	X	6	X

The number in a cell represents the count of the immediate neighboring cells (left, right, top, bottom, diagonals) NOT having a cross (X). Given that the last row has no crosses (X), the sum of the four numbers to be filled in the last row is

(a) 11

(b) 10

(c) 12

(d) 9

Ans: (a)

Sol: Let's assume that last rows has x_1 , x_2 , x_3 , x_4 elements.

1	X	4	3
X	5	5	4
3	X	6	X
x1	x2	x3	x4

1. Neighbour's (x_1) = 3 , x_2 , it has 2 neighbour so value= 2 .
2. Neighbour's (x_2) = 3 , 6 , x_1 , x_3 , it has 4 neighbour so value= 4 .

3. Neighbour's (x_3) = 6 , x_2 , x_4 , it has 3 neighbour so value=3.
4. Neighbour's (x_4) = 6 , x_3 , it has 2 neighbour so value=2

1	X	4	3
X	5	5	4
3	X	6	X
2	4	3	2

So value ($x_1 + x_2 + x_3 + x_4$) = 2 + 4 + 3 + 2 = 11

Option (A) is correct.

Q2: A cube is to be cut into 8 pieces of equal size and shape. Here, each cut should be straight and it should not stop till it reaches the other end of the cube. (2024 SET 2) The minimum number of such cuts required is

(a) 3

(b) 4

(c) 7

(d) 8

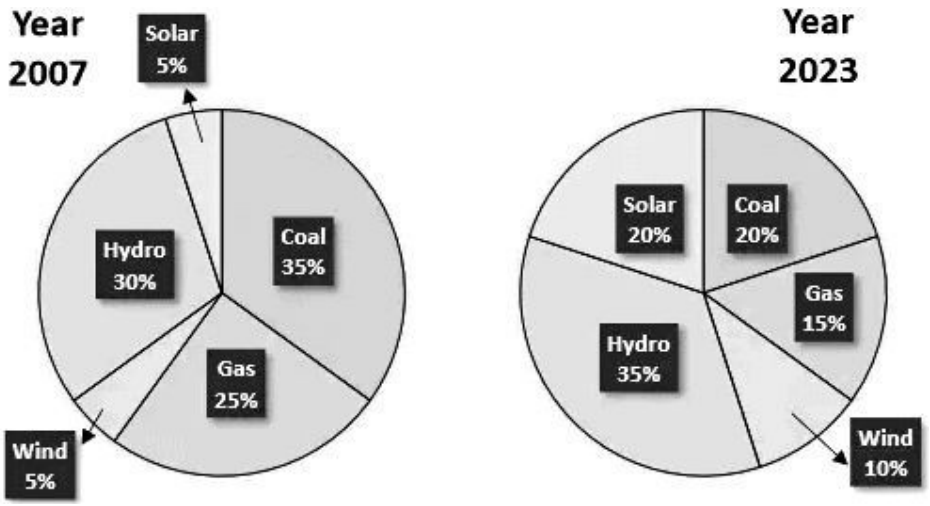
Ans: (a)

Sol: To cut a cube into 8 pieces of equal size and shape, you can achieve this with 3 cuts. Here's how:

1. Make the first cut parallel to one face of the cube, dividing it into two equal halves.
2. Make the second cut perpendicular to the first cut, dividing the cube into four equal quarters.
3. Make the third cut perpendicular to both previous cuts, dividing each quarter into two equal parts.

After these three cuts, you will have 8 pieces of equal size and shape. So, the minimum number of cuts required is 3.

Q3: The pie charts depict the shares of various power generation technologies in the total electricity generation of a country for the years 2007 and 2023. (2024 SET 2)



The renewable sources of electricity generation consist of Hydro, Solar and Wind. Assuming that the total electricity generated remains the same from 2007 to 2023, what is the percentage increase in the share of the renewable sources of electricity generation over this period?(a) 25%

(b) 50%

(c) 77.50%

(d) 62.5%

Ans: (d)

Sol: Assume that 100 units of electricity is generated every year from 2007 to 2023

Electricity generated from renewable resources in 2007 = 30 + 5 + 5 = 40 units

Electricity generated from renewable resources in 2023 = 35 + 20 + 10 = 65 units

Percentage increase in share of renewable resources in electricity generation from 2007 to 2023

= (65 - 40)/40 * 100

= 62.5%

Q4: A person sold two different items at the same price. He made 10% profit in one item, and 10% loss in the other item. In selling these two items, the person made a total of (2024 SET 2)

(a) 1% profit

(b) 2% profit

(c) 1% loss

(d) 2% loss

Ans: (c)

Sol: If the first profit/loss is x% and second profit/loss is y% then overall profit/loss % is calculated as:

Total profit/loss=x+y + xy / 100%

- we use +sign if profit happens
- we use - sign if loss happens

It is given that the first 10%profit is followed by 10% loss so overall ;

Total profit/loss=10 + (-10) +10 * (- 10)/ 100 % ⇒ -100/ 100 % = -1%

we know that the minus sign indicates loss so overall 1% loss made by the person.

Option (C) is correct.

Q5: Sequence the following sentences in a coherent passage. (2024 SET 2)

P: This fortuitous geological event generated a colossal amount of energy and heat that resulted in the rocks rising to an average height of 4 km across the contact zone.

Q: Thus, the geophysicists tend to think of the Himalayas as an active geological event rather than as a static geological feature.

R: The natural process of the cooling of this massive edifice absorbed large quantities of atmospheric carbon dioxide, altering the earths ? atmosphere and making it better suited for life.

S: Many millennia ago, a breakaway chunk of bedrock from the Antarctic Plate collided with the massive Eurasian Plate.

(a) QPSR

(b) QSPR

(c) SPRQ

(d) SRPQ

Ans: (c)

Sol: This sequence introduces the geological event, describes its consequences, and then discusses its significance to geophysicists.

Q6: In the sequence 6, 9, 14, x, 30, 41, a possible value of x is

(a) 25

(b) 21

(c) 18

(d) 20

Ans: (b)

Sol: the pattern of the given series is as follows:

- 6 + 3 = 9
- 9 + 5 = 14
- 14 + 7 = 21
- 21 + 9 = 30
- 30 + 11 = 41

Option (B) is correct.

Q7: For positive non-zero real variables x and y, if (2024 SET 2)

ln (x + y / 2) = 1 /2 [In (y)]

then, the value of x / y + y / x is

(a) 1

(b) 2-Jan

(c) 2

(d) 4

Ans: (c)

Sol: $\log (x + y)/2 = 1/2 (\log x + \log y)$

$\Rightarrow \log (x + y)/2 = 1/2 (\log xy)$

$\Rightarrow \log (x + y)/2 = \log \sqrt{xy}$

$\Rightarrow (x + y)/2 = \sqrt{xy}$

Squaring both side we get;

$\Rightarrow x^2 + y^2 + 2xy = 4xy$

$\Rightarrow x^2 + y^2 = 4xy - 2xy$

$\Rightarrow x^2 + y^2 = 2xy$

$\Rightarrow x^2 + y^2/xy = 2$

$\Rightarrow x^2/xy + y^2/xy = 2$

$x/y + y/x = 2$

So 2 is the correct answer.

Q8: In an engineering college of 10,000 students, 1,500 like neither their core branches nor other branches. The number of students who like their core branches is 1/4th of the number of students who like other branches. The number of students who like both their core and other branches is 500. (2024 SET 2)

The number of students who like their core branches is

(a) 1,800

(b) 3,500

(c) 1,600

(d) 1,500

Ans: (a)

Sol: Let Ω, C, O be the set of total students(universal set), students who like their core branch and students who like other branches respectively.

Given: - $|\Omega| = 10000$, $|C^c \cap O^c| = 1500$, $|O| = 4|C|$, $|C \cap O| = 500$

To find :$|C| = ?$

We know that,

$|C \cup O| = |\Omega| - |(C \cup O)^c|$

$|C \cup O| = |\Omega| - |(C^c \cap O)^c|$ (De Morgan 's law)

$|C \cup O| = 10000 - 1500 = 8500$

Also,

$|C \cup O| = |C| + |O| - |C \cup O|$

$|C| + |O| = |C \cup O| + |C \cup O|$

$5\,|C| = 8500 + 500 = 9000$

$|C| = 9000 / 5 = 1800$

So, the number of students who like their core branches is 1800.

Q9: Two wizards try to create a spell using all the four elements, water, air, fire, and earth. For this, they decide to mix all these elements in all possible orders. They also decide to work independently. After trying all possible combination of elements, they conclude that the spell does not work. (2024 SET 2)

How many attempts does each wizard make before coming to this conclusion, independently?

(a) 24

(b) 48

(c) 16

(d) 12

Ans: (a)

Sol: Mixing 4 distinct elements in all possible orders can be done in 4! ways.

Q10: If '→' denotes increasing order of intensity, then the meaning of the words [walk → jog → sprint] is analogous to [bothered → _____ → daunted].

Which one of the given options is appropriate to fill the blank?

(a) phased

(b)phrased

(c) fazed

(d) fused

Ans: (c)

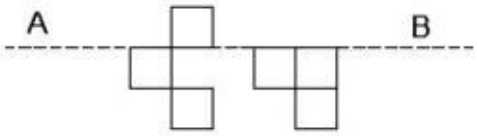
Sol: 1. " B o t h e r e d " signifies a mild level of discomfort or concern.

2. " D a u n t e d " implies a much stronger feeling of being intimidated or overwhelmed.

To maintain the analogy with the progression from "walk" to "jog" to "sprint," we need a word that represents an intermediate level of intensity between being bothered and being daunted.

" F a z e d " fits this criterion as it suggests a level of perturbation or discomposure that is stronger than being bothered but not as intense as being daunted.

Q11:The least number of squares to be added in the figure to make AB a line of symmetry is (2024 SET 1)



(a) 6

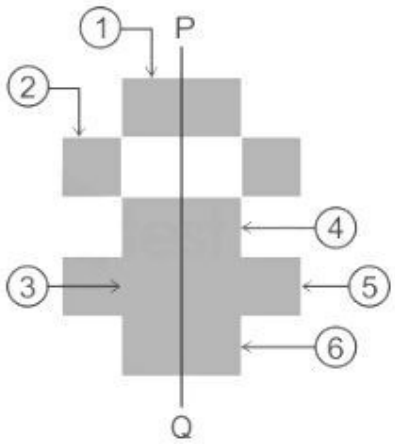
(b) 4

(c) 5

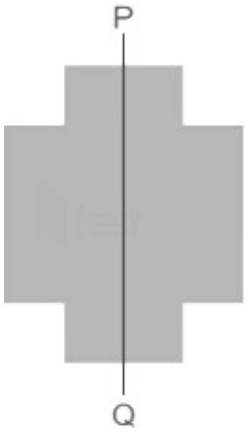
(d) 7

Ans: (a)

Sol: For symmetry we have to add some squares



After combining the obtained figure we get



Hence for making the P-Q line symmetry 6 squares must be added

Q12: A rectangular paper of 20cm x 8cm is folded 3 times. Each fold is made along the line of symmetry, which is perpendicular to its long edge. The perimeter of the final folded sheet (in cm) is (2024 SET 1)

(a) 18

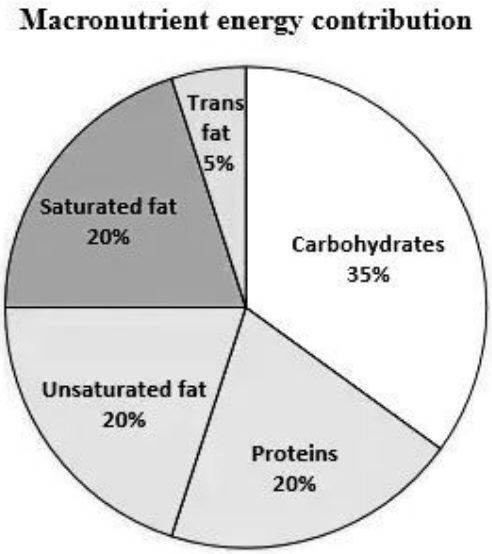
(b) 24

(c) 20

(d) 21

Ans: (a)

Q13: The pie chart presents the percentage contribution of different macronutrients to a typical 2,000 kcal diet of a person.



The typical energy density (kcal/g) of these macronutrients is given in the table.

$Macronutrient$	$Energydensity(kcal/g)$
$Carbohydrates$	4
$Proteins$	4
$Unsaturatedfat$	9
$Saturatedfat$	9
$Transfat$	9

The total fat (all three types), in grams, this person consumes is

(a) 44.4

(b) 77.8

(c) 100

(d) 3600

Ans: (c)

Sol: To determine the total fat (all three types) in grams that a person consumes based on the provided pie chart and energy density table, we will follow these steps:

Solution By Steps

Step 1: Calculate Total Energy from Each Macronutrient

The total energy intake is 2,000 kcal. We will calculate the energy contribution from each macronutrient based on their percentage.

- Carbohydrates: 35% of 2000 kcal = 0.35 * 2000 = 700 kcal
- Proteins: 20% of 2000 kcal = 0.20 * 2000 = 400 kcal
- Unsaturated fat: 20% of 2000 kcal = 0.20 * 2000 = 400 kcal
- Saturated fat: 20% of 2000 kcal = 0.20 * 2000 = 400 kcal
- Trans fat: 5% of 2000 kcal = 0.05 * 2000 = 100 kcal

Step 2: Calculate Grams of Each Macronutrient

Using the energy density values, we convert kcal to grams.

- Carbohydrates: 700 kcal / 4 kcal/g = 175 g
- Proteins: 400 kcal / 4 kcal/g = 100 g
- Unsaturated fat: 400 kcal / 9 kcal/g = 44.44 g
- Saturated fat: 400 kcal / 9 kcal/g = 44.44 g
- Trans fat: 100 kcal / 9 kcal/g = 11.11 g

Step 3: Calculate Total Fat in Grams

Now, we sum the grams of all types of fat.

- Total fat = Unsaturated fat + Saturated fat + Trans fat
- Total fat = 44.44 g + 44.44 g + 11.11 g = 100 g

Final Answer

The total fat (all three types) consumed is 100 grams.

Q14: A rectangular paper sheet of dimensions 54cm x 4cm is taken. The two longer edges of the sheet are joined together to create a cylindrical tube. A cube whose surface area is equal to the area of the sheet is also taken. (2024 SET 1)

Then, the ratio of the volume of the cylindrical tube to the volume of the cube is

(a) 1 / π

(b) 2 / π

(c) 3 / π

(d) 4 / π

Ans: (a)

Sol: The circumference of the cylindrical tube is equal to the shorter side of the rectangular sheet, which is 4 cm.

Let the radius of the cylinder be r. Then, the circumference is $2\pi r = 4$. So, $r = 2 / \pi$.

The height of the cylinder is equal to the longer side of the rectangular sheet, which is 54 cm.

The volume of the cylinder is given by $V_c = \pi r^2 h = \pi (2 / \pi)^2 . 54 = 216 / \pi$.

Let the side of the cube be a. The surface area of the cube is $6a^2$, which is equal to the area of

the rectangular sheet: $6a^2 = 54 . 4$, so $a^2 = 36$ and $a = 6$

The volume of the cube is given by $V_b = a^3 = 6^3 = 216$.

The ratio of the volume of the cylinder to the volume of the cube is Vc / Vb = 216 π =

$$\boxed{\frac{1}{\pi}}$$

Q15: In the given text, the blanks are numbered (i)-(iv). Select the best match for all the blanks. (2024 SET 1)

Steve was advised to keep his head ___(i)___ before heading __(ii)__ to bat; for, while he had a head __(iii)__ batting, he could only do so with a cool head s __(iv)__ his shoulders

(a) (i) down (ii) down (iii) on (iv) for

(b) (i) on (ii) down (iii) for (iv) on

(c) (i) down (ii) out (iii) for (iv) on

(d) (i) on (ii) out (iii) on (iv) for

Ans: (c)

Sol: In the first blank, we can only use "down" and not "on". Here, "keeping head down" would mean "he was advised not to engage (fight) with the players of other team" and this fits well in the given context because further down the passage it was said he could do

good batting only when he has a cool head.

In the second blank, we can use both "down" and "out". In the context of cricket using either of the words would result in same meaning.

In the third blank, we can use both "on" and "for". Here, "he had a head on batting" would mean "he played aggressively" and "he had a head for batting" would mean "he had the cognitive ability for being good at batting".

In the fourth blank, we can only use "on" and not "for".

Answer - C

Q16: For positive non-zero real variables p and q, if (2024 SET 1)

$\log(p^2 + q^2) = \log p + \log q + 2\log 3$,

then, the value of $p^4 + q^4 / p^2 q^2$ is

(a) 79

(b) 81

(c) 9

(d) 93

Ans: (a)

Sol: Given that, $\log(p^2 + q^2) = \log p + \log q + 2\log 3$

We can assume it's a log base 10

$\log_{10}(p^2 + q^2) = \log_{10} p + \log_{10} q + 2\log_{10} 3$

$\log_{10}(p^2 + q^2) = \log_{10}(pq) + \log_{10} 3^2$

$\log_{10}(p^2 + q^2) = \log_{10}(9pq)$

$(p^2 + q^2) = (9pq)$

We can take a square on both sides.

$(p^2 + q^2)^2 = (9pq)^2$

$p^2 + q^2 + 2p^2 q^2 = 81 p^2 q^2$

$p^4 + q^4 = 81 p^2 q^2 - 2 p^2 q^2$

$p^4 + q^4 = 79\ p^2\ q^2$

$p^4 + q^4 / p^2\ q^2 = 79$

Q17: The number of coins of Rs. 1, Rs. 5, and Rs. 10 denominations that a person has are in the ratio 5:3:13. Of the total amount, the percentage of money in Rs. 5 coins is (2024 SET 1)

(a) 21 %

(b) 14 2 / 7 %

(c) 10 %

(d) 30 %

Ans: (c)

Sol: Given the ratio of coins: ₹1 : ₹5 : ₹10 = 5x : 3x : 13x

Total number of coins = 5x + 3x + 13x = 21x

Total amount of money = ₹(5x + 15x + 130x) = ₹150x

Percentage of money in ₹5 coins = (Amount contributed by ₹5 coins / Total amount) * 100%

= (15x / 150x) * 100%

= 10%

So, the percentage of money in ₹5 coins is 10%.

Q18: Consider the following sample of numbers: (2024 SET 1)

9, 18, 11, 14, 15, 17, 10, 69, 11, 13

The median of the sample is

(a) 13.5

(b) 14

(c) 11

(d) 18.7

Ans: (a)

Q19: If two distinct non-zero real variables x x and y y are such that (x + y) is proportional to (x - y) then the value of x / y (2024 SET 1)

(a) depends on x y

(b) depends only on x x and not on y

(c) depends only on y y and not on x x

(d) is a constant

Ans: (d)

Sol: Given that, (x + y) = K (x - y)

⇒ x + y = K x - K y

⇒ y + K y = K x - x

⇒ x (K - 1) = y (K + 1)

⇒ x / y = (K + 1) / (K - 1)

⇒ x / y = Constant

Correct Answer: D

Q20: If '→' denotes increasing order of intensity, then the meaning of the words [dry → arid → parched] is analogous to [diet → fast → _____]. (2024 SET 1)

Which one of the given options is appropriate to fill the blank?

(a) starve

(b) reject

(c) feast

(d) deny

Ans: (a)

Sol: A. starve - cause to suffer from hunger

B. Reject - to deny

C. Feast - A big meal

D. Deny - Do not accept

diet ---> fast ---> starve

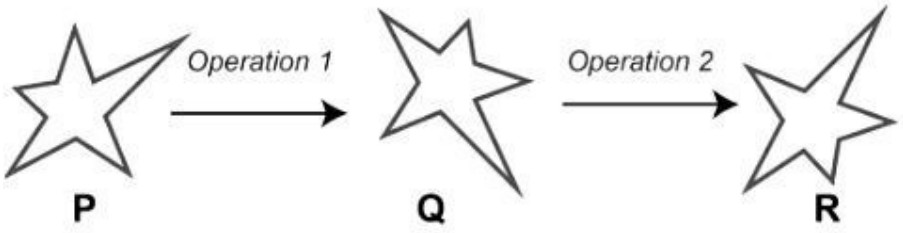
diet - a well scheduled food time table

fast - skipping meal for any cause

starve - suffer from hunger

Therefore , according to the level of intensity A. Starve is the correct answer.

Q21: Which one of the options best describes the transformation of the 2-dimensional figure P to Q, and then to R, as shown ? (2023)



(a) Operation 1: A clockwise rotation by 90^0about an axis perpendicular to the plane of the figure

Operation 2: A reflection along a horizontal line

(b) Operation 1: A counter clockwise rotation by 90 about an axis perpendicular to the plane of the figure

Operation 2: A reflection along a horizontal line

(c) Operation 1: A clockwise rotation by 90^0about an axis perpendicular to the plane of the figure

Operation 2: A reflection along a vertical line

(d) Operation 1: A counter clockwise rotation by 180^0about an axis perpendicular to the plane of the figure

Operation 2: A reflection along a vertical line

Ans: (a)

Sol: If we observed image P → Q as operation 1 it will rotate 90^0 in a clockwise direction.

so Option B , D is eliminated.

From the image, Q→R as operation 2

it is a reflective image based on a horizontal line. so option C is also eliminated.

∴Option (A) is correct.

Q22: f(x) and g (y) are functions of x and y, respectively, and f (x) = g (y) for all real values of x and y. Which one of the following options is necessarily TRUE for all x and y ? (2023)

(a) f(x) = 0 and g (y) = 0

(b) f(x) = g(y) = constant

(c) f(x) ≠ constantand g (y) ≠ constant

(d) f(x) + g(y) = f(x) - g (y)

Ans: (b)

Sol: When we define "functions", we should also have to define domain and co-domain but sometimes it is not defined in gate.

Here, domain is defined but co-domain is not defined, so I am taking it as set of real numbers.

So, we have f : R → R and g: R → R

Now, two functions f and g are equal if they have the same domain and codomain and for every element x

in the domain (because dom(f)=dom(g)), f (x) = g (x) .

for example, f (x) = x / 2 and g (x) = 2x / 4

But, here, we have given two equal functions where x and y may or may not be same i.e. f (x) = g (y) where x and y belongs to the set of real numbers.

So, ∀ x , y ∈ R , f (x) = g (y) and it is true when all x ∈ R maps to some element, say, c where c belongs to set R which is the codomain of f and similarly, all y ∈ R maps to same element c where c belongs to set R which is the codomain of g and in this way both domain and codomain of f and g are equal and ∀ x , y ∈ R , f (x) = f (y) = c where c is some arbitrary constant.

Hence, (B)

Q23: Which one of the following sentence sequences creates a coherent narrative? (2023)

(i) Once on the terrace, on her way to her small room in the corner, she notices the man right away.

(ii) She begins to pant by the time she has climbed all the stairs.

(iii) Mina has bought vegetables and rice at the market, so her bags are heavy.

(iv) He was leaning against the parapet, watching the traffic below.

(a) (i), (ii), (iv), (iii)

(b) (ii), (iii), (i), (iv)

(c) (iv), (ii), (i), (iii)

(d) (iii), (ii), (i), (iv)

Ans: (d)

Sol: The correct sequence that creates a coherent narrative is:

- (iii) Mina has bought vegetables and rice at the market, so her bags are heavy.
- (ii) She begins to pant by the time she has climbed all the stairs.
- (i) Once on the terrace, on her way to her small room in the corner, she notices the man right away.
- (iv) He was leaning against the parapet, watching the traffic below.

Q24: Consider two functions of time (t) , (2023)

$f(t) = 0.01\,t^2$

$g(t) = 4t$

where

$0 < t < \infty$

Now consider the following two statements:

(i) For some $t > 0$, $g(t) > f(t)$.

(ii) There exists a T, such that $f(t) > g(t)$ for all $t > T$.

Which one of the following options is TRUE?

(a) only (i) is correct

(b) only (ii) is correct

(c) both (i) and (ii) are correct

(d) neither (i) nor (ii) is correct

Ans: (c)

Sol: The given functions are = f (t) = 0.01 t^2 and g (t) = 4t . We need to determine whether the two given statements are true or false.

(i) For some t > 0, g (t) > f (t) :

Substituting f (t) and g (t) in the inequality, we get

g (t) > f(t)

⇒ 4t > 0.01t2

⇒ 400 > t

Thus, the statement (i) is true for 0 < t < 400, since g (t) will always be greater than f (t) in this interval.

(ii) There exists a T , such that f (t) > g (t) for all t > T:

Substituting f (t) and g (t) in the inequality, we get

f (t) > g (t)

⇒ t0.01 t^2> 4 t

⇒ t > 400

Thus, the statement (i) is true for t > 400 , since f(t) will always be greater than g (t) in this interval.

.Therefore, option (C) Both (i) and (ii) are true.

Q25: The country of Zombieland is in distress since more than 75% of its working population is suffering from serious health issues. Studies conducted by competent health experts concluded that a complete lack of physical exercise among its working population was one of the leading causes of their health issues. As one of the measures to address the problem, the Government of Zombieland has decided to provide monetary incentives to those who ride bicycles to work. (2023)

Based only on the information provided above, which one of the following statements

can be logically inferred with certainty?

(a) All the working population of Zombieland will henceforth ride bicycles to work.

(b) Riding bicycles will ensure that all of the working population of Zombieland is free of health issues.

(c) The health experts suggested to the Government of Zombieland to declare riding bicycles as mandatory.

(d) The Government of Zombieland believes that riding bicycles is a form of physical exercise.

Ans: (d)

Sol:

- The statement that "All the working population of Zombieland will henceforth ride bicycles to work" cannot be logically inferred, as the information provided does not indicate that everyone will necessarily start riding bicycles to work.
- The statement that "Riding bicycles will ensure that all of the working population of Zombieland is free of health issues" cannot be logically inferred, as it is possible that other health issues could be affecting the population.
- The statement that "The health experts suggested to the Government of Zombieland to declare riding bicycles as mandatory" cannot be logically inferred, as there is no information provided on what the health experts recommended to the government.
- The Government of Zombieland believes that riding bicycles is a form of physical exercise. It can be logically inferred with certainty.

Q26: Looking at the surface of a smooth 3-dimensional object from the outside, which one of the following options is TRUE? (2023)

(a) The surface of the object must be concave everywhere.

(b) The surface of the object must be convex everywhere.

(c) The surface of the object may be concave in some places and convex in other places.

(d) The object can have edges, but no corners.

Ans: (c)

Sol: Hence, (A) and (B) are eliminated and (C) is correct.

Also, the texture of this 3 - dimensional object is smooth because it is having continuous even surface and not having bumps, holes, ridges or any rough surface.

A smooth surface has a well-defined tangent plane at every point of the surface.

Now, option (D) may be correct depends on what "edge" implies here. If you consider the curved edge (like a self loop in graphs) as an edge then option (D) is also correct because consider a cylinder which has 2 curved edges, 1 curved surface, 2 flat faces and no corners but if you consider the edge as an straight line then for a finite three-dimensional object, option (D) is wrong because where at least two lines or straight edges meet, it creates a corner and according to the definition of smoothness, it should not have a sudden rise or fall and so it will not be a smooth object and so if edge means straight edges then (D) is wrong.

Since question implies only one option is correct, so you can either go with (C) or (D).

Q27: A survey for a certain year found that 90% of pregnant women received medical care at least once before giving birth. Of these women, 60% received medical care from doctors, while 40% received medical care from other healthcare providers. (2023)

Given this information, which one of the following statements can be inferred with certainty?

(a) More than half of the pregnant women received medical care at least once from a doctor.

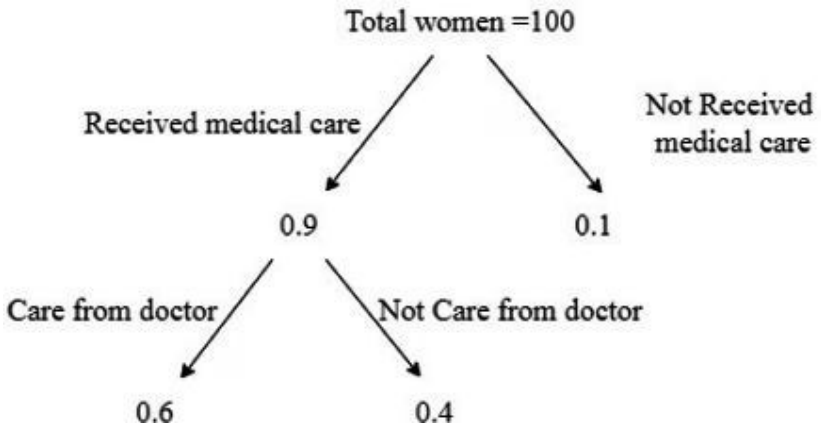
(b) Less than half of the pregnant women received medical care at least once from a doctor.

(c) More than half of the pregnant women received medical care at most once from a doctor.

(d) Less than half of the pregnant women received medical care at most once from a doctor.

Ans: (a)

Sol:



From the above diagram:

- The number of pregnant women who received medical care from doctor= $0.6 * 0.9 * 100 = 54$
- The number of pregnant women who received medical care, not from a doctor (other health care providers)= $0.4 * 0.9 * 100 = 36$

Option (A) is correct.

Q28: A series of natural numbers $F_1, F_2, F^3, F^4, F^5, F^6, F^7, \ldots$ obeys $F_{n+1} = F_n + F_{n-1}$ for all integers $n \geq 2$.

If $F_6 = 37$ F 6 =37, and $F_7 = 60$, then what is F_1 ? (2023)

(a) 4

(b) 5

(c) 8

(d) 9

Ans: (a)

Sol: it is given that $f_{n+1} = f_n + f_{n-1}$

if we put n = 6, 5, 4, 3, 2 we get our value.

put $n = 6 \rightarrow f_7 = f_6 + f_5 \Rightarrow f_5 = 60 - 37 = 23$

put $n = 5 \rightarrow f_6 = f_5 + f_4 \Rightarrow f_4 = 37 - 23 = 14$

put $n = 4 \rightarrow f_5 = f_4 + f_3 \Rightarrow f_3 = 23 - 14 = 9$

put $n = 3 \rightarrow f_4 = f_3 + f_2 \Rightarrow f_2 = 14 - 9 = 5$

put $n = 2 \rightarrow f_3 = f_2 + f_1 \Rightarrow f_1 = 9 - 5 = 4$

So we get $f_1 = 4$option (A) is correct.

Q29: Kind : _____ : : Often : Frequently (2023)

(By word meaning)

(a) Mean

(b) Type

(c) Cruel

(d) Kindly

Ans: (b)

Sol: Often and Frequently are both adverbs and synonymous in meaning, indicating a high degree of frequency
or occurrence.

The relationship between Kind and Type is that of synonymy or similarity in meaning, as they both refer to
categories or classifications.

Therefore, the pair that exhibits the same relationship as the given pair is "Kind : Type" and "Often :
Frequently".

Q30: We reached the station late, and _____ missed the train. (2023)

(a) near

(b) nearly

(c) utterly

(d) mostly

Ans: (b)

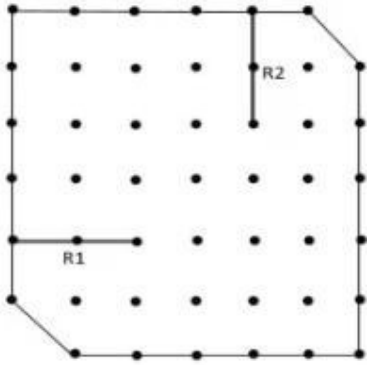
Sol: Here utterly means "completely"
whereas mostly means "almost all the time",

and nearly means "not completely, not exactly"

we reached the station late and nearly missed the train.

Option (B) is correct.

Q31: A plot of land must be divided between four families. They want their individual plots to be similar in shape, not necessarily equal in area. The land has equally spaced poles, marked as dots in the below figure. Two ropes, R1 and R2, are already present and cannot be moved. What is the least number of additional straight ropes needed to create the desired plots? A single rope can pass through three poles that are aligned in a straight line. (2022)



(a) 2

(b) 4

(c) 5

(d) 3

Ans: (d)

Sol: Using 3 additional ropes we can divide into similar shape plot

Q32: The corners and mid-points of the sides of a triangle are named using the distinct letters P, Q, R, S, T and U, but not necessarily in the same order. Consider the following statements: (2022)

The line joining P and R is parallel to the line joining Q and S.

P is placed on the side opposite to the corner T.

S and U cannot be placed on the same side.

Which one of the following statements is correct based on the above information?

(a) P cannot be placed at a corner

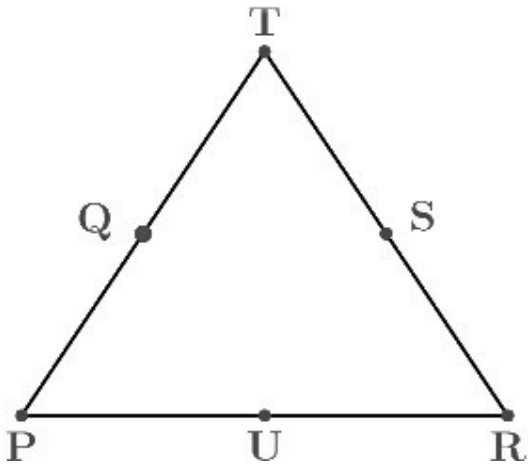
(b) S cannot be placed at a corner

(c) U cannot be placed at a mid-point

(d) R cannot be placed at a corner

Ans: (b)

Sol: From the given statement we draw the triangle satisfying options A, C and D as shown below.



But S can not be placed at any corner satisfying the given statements.

So, answer is B

Q33: A box contains five balls of same size and shape. Three of them are green coloured balls and two of them are orange coloured balls. Balls are drawn from the box one at a time. If a green ball is drawn, it is not replaced. If an orange ball is drawn, it is replaced with another orange ball. (2022)

First ball is drawn. What is the probability of getting an orange ball in the next draw?

(a) 1 / 2

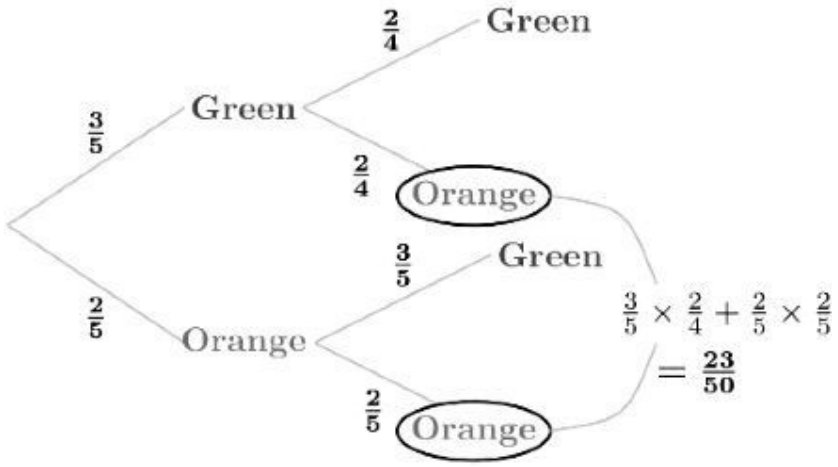
(b) 8 / 25

(c) 19 / 50

(d) 23 / 50

Ans: (d)

Sol: We can solve it using tree diagram.



Tree Diagram is the best method to solve many Probability Questions.

Q34: In a recently conducted national entrance test, boys constituted 65% of those who appeared for the test. Girls constituted the remaining candidates and they accounted for 60% of the qualified candidates. (2022)

Which one of the following is the correct logical inference based on the information provided in the above passage?

(a) Equal number of boys and girls qualified

(b) Equal number of boys and girls appeared for the test

(c) The number of boys who appeared for the test is less than the number of girls who appeared

(d) The number of boys who qualified the test is less than the number of girls who qualified

Ans: (d)

Sol: Lets assume, total number of student is 100.

Now, boys constituted of 65% of appeared students.

So total number of boys who appeared = 65

Total number of girls who appeared = 100 - 65 = 35.

Now, Girls accounted for 60% of qualified students.

So, no of girls who qualified = 0.6 X where X is the total number of qualified students and number of boys

who qualified = 0.4 K

So, options A, B and C are false and correct answer is D.

Q35: Some people believe that "what gets measured, improves". Some others believe that "what gets measured, gets gamed". One possible reason for the difference in the beliefs is the work culture in organizations. In organizations with good work culture, metrics help improve outcomes. However, the same metrics are counterproductive in organizations with poor work culture. (2022)

Which one of the following is the CORRECT logical inference based on the information in the above passage?

(a) Metrics are useful in organizations with poor work culture

(b) Metrics are useful in organizations with good work culture

(c) Metrics are always counterproductive in organizations with good work culture

(d) Metrics are never useful in organizations with good work culture

Ans: (b)

Sol:

Explanation: $\Longrightarrow$ The question clearly says that the metrics are useful in the organizations with good

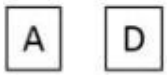
work culture, generally or in most of the cases. Though, this never implies that it always works.

Hence, option (D) is definitely wrong, as it is in the stricter sense.

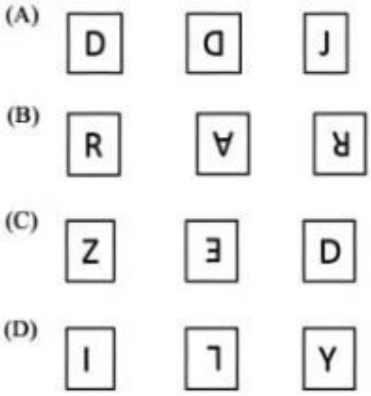
Option (A) is clearly wrong as explained above.

Similarly, option (C) is wrong as it says always which is nowhere implied in the above question.

Q36: A palindrome is a word that reads the same forwards and backwards. In a game of words, a player has the following two plates painted with letters. (2022)



From the additional plates given in the options, which one of the combinations of additional plates would allow the player to construct a five-letter palindrome. The player should use all the five plates exactly once. The plates can be rotated in their plane.



(a) A

(b) B

(c) C

(d) D

Ans: (b)

Sol:

Logic :

Player needs to make a 5-Letter Palindrome word.

In any odd-letters palindrome word, the middle letter must be present odd number of times. Every other letter(which is Not the middle letter) must be present even number of times.

Using this logic, we can see that in a 5-letter word, Exactly one letter must appear odd number of times(this letter will become the middle letter), and every other letter must

appear even number of times.

Also, if we have the following collection of letters then we can definitely make some palindrome from them :

"Exactly one letter appears odd number of times(this letter will become the middle letter), and every other letter appears even number of times".

So, we have a "if and only if theorem" from these observations :

"Let S be a collection of letters. There exists a palindrome P using all the letters of S if and only if Exactly one letter in S

appears odd number of times,

and every other letter appears even number of times"

We get answer as Option B.

In { A , D , D , D , J } , three letters are appearing odd number of times, So, Option A is wrong.

Option C :

In { A , D , Z , D , E } , three letters are appearing odd number of times, So, Option C is wrong.

Option D :

In { A , D , I , L , Y } , five letters are appearing odd number of times, So, Option D is wrong.

Q37: Given below are four statements. (2022)

Statement 1: All students are inquisitive.

Statement 2: Some students are inquisitive.

Statement 3: No student is inquisitive.

Statement 4: Some students are not inquisitive.

From the given four statements, find the two statements that CANNOT BE TRUE simultaneously, assuming that there is at least one student in the class.

(a) Statement 1 and Statement 3

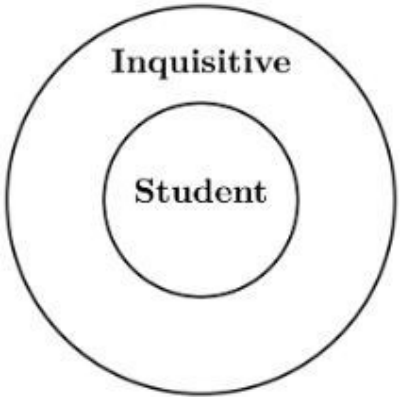
(b) Statement 1 and Statement 2

(c) Statement 2 and Statement 4

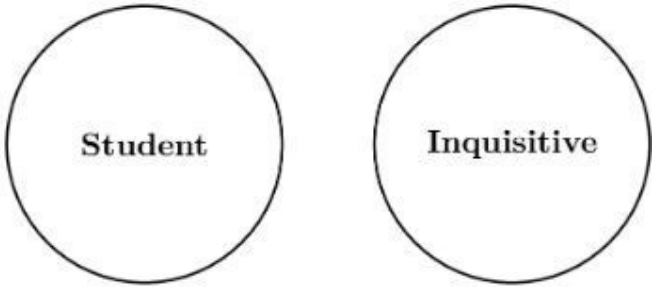
(d) Statement 3 and Statement 4

Ans: (a)

Sol: Statement 1 implies



Statement 3 implies



Both cannot be true simultaneously.

So option A is the answer.

For all other options we can make the given statements true simultaneously.

Q38: Let r be a root of the equation x 2 + 2 x + 6 = 0 (2022)

Then the value of the expression (r + 2) (r + 3) (r + 4) (r + 5) is

(a) 51

(b) - 51

(c) 126

(d) -126

Ans: (d)

Sol: Since r is a root of the given equation $x^2 + 2x + 6 = 0$,

So, r will satisfy this equation. Hence, we have

$r^2 + 2r + 6 = 0$

$\Rightarrow \boxed{r^2 + 2r = -6}$

The value of expression

$(r + 2)(r + 3)(r + 4)(r + 5) = (r^2 + 5r + 6)(r^2 + 9r + 20) = (r^2 + 2r + 6 + 3r)(r^2 + 9r + 20) =$

$(r^2 + 2r + 6 + 14 + 7r) = (3r)(7r + 14) = 21((r^2 + 2r) = 21 \times -6 = -126.$

Q39: A function y(x) is defined in the interval [0, 1] on the x-axis as: (2022)

y(x) =

$$\begin{cases} 2 & if \quad 0 \leq x \leq \frac{1}{3} \\ 3 & if \quad \frac{1}{3} \leq x \leq \frac{3}{4} \\ 1 & if \quad \frac{3}{4} \leq x \leq 1 \end{cases}$$

Find the total area under the function y(x) in the given interval.

(a) 5 / 6

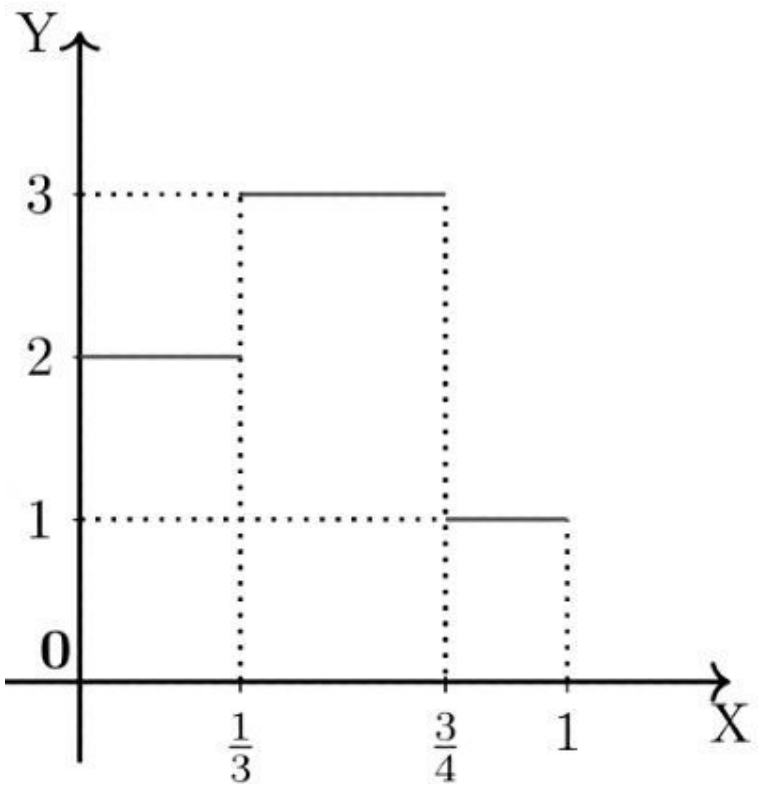
(b) 6 / 5

(c) 13 / 6

(d) 6 / 13

Ans: (c)

Sol:



The Area of the function y(x)is composed of an area of three rectangles, as shown in the above picture.

Total area = [2* (1 / 3 - 0)] + (3 / 4 - 1 / 3)] + [1 * (1 - 3 / 4)]

= 2 / 3 + 15 / 12 + 1 / 4 = 26 / 12 = 13 / 6 unit ^{2}.

Q40: The _____ is too high for it to be considered _____(2022)

(a) fair / fare

(b) faer / fair

(c) fare / fare

(d) fare / fair

Ans: (d)

Sol: Fare : the amount of money you pay to travel by bus, train, taxi etc.

Fair : appropriate and acceptable in a particular situation the fare is high for it to be considered fair.

Here it is clearly seen that we are talking about amount, so first filler should be "fare" and from this option B and C are eliminated and second filler is given the sense of right, so it should be "fair".

Q41: Six students P, Q, R, S, T and U, with distinct heights, compare their heights and make the following observations. (2021 SET 2) Observation I: S is taller than R.
Observation II: Q is the shortest of all.
Observation III: U is taller than only one student.
Observation IV: T is taller than S but is not the tallest
The number of students that are taller than R is the same as the number of students shorter than
(a) T
(b) R
(c) S
(d) P
Ans: (c)
Sol: Let us arrange people in decreasing order of heights:
By looking at each observation, we fill these stars : $*, *, *, *, *, *$ where the left-most star corresponds to the tallest person and the rightmost star corresponds to the shortest person.
i. S is taller than R
So, S > R
ii. Q is the shortest of all.
So, we have
$*, *, *, *, *, Q$
iii. U is taller than only one student.
So, U is second tallest. Hence,
$*, *, *, *, U, Q$
iv. T is taller than S

but not tallest.

Tis taller than S

implies T > S.

From observations i and iv, we have T > S > R .

Thus, we have one of these possibilities:

- ∗, T, S, R, U, Q or
- T, ∗, S, R, U, Q or
- T, S, ∗, R, U, Q or
- T, S, R, ∗, U, Q or

But it is mentioned that T is not the tallest person.

So we are left with only one possibility:

∗, T, S, R, U, Q or

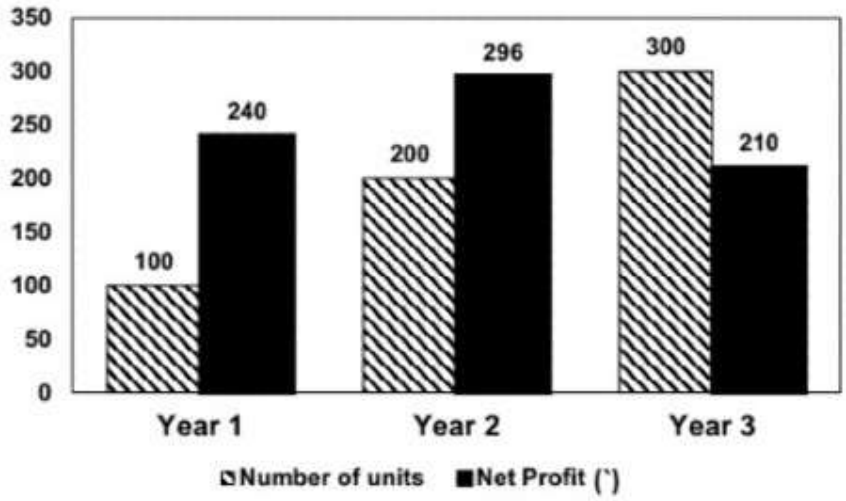
Since, we have only one student p left, we fill the blank with p

P, T, S, R, U, Q

- Number of students taller than R = 3 (P, T, S)
- Number of students shorter than T = 4
- Number of students shorter than R = 2
- Number of students shorter than S = 3

Hence, option C is the correct answer.

Q42:



The number of units of a product sold in three different years and the respective net profits are presented in the figure above. The cost/unit in Year 3 was Re. 1, which was half the cost/unit in Year 2. The cost/unit in Year 3 was one-third of the cost/unit in Year 1. Taxes were paid on the selling price at 10%, 13%, and 15% respectively for the three years. Net profit is calculated as the difference between the selling price and teh sum of cost and taxes paid in that year. (2021 SET 2)

The ratio of the selling price in Year 2 to the selling price in Year 3 is_____ _.

(a) 4:03

(b) 1:01

(c) 3:04

(d) 1:02

Ans: (a)

Sol: Lets denote CP_x and SP_x for per unit Cost Price and Selling Price respectively for year x . Given that

$1/3\, CP_1 = 1/2\, CP_2 = CP_3 = ₹\, 1$

$\Rightarrow CP_2 = ₹\, 2,\ CP_3 = ₹\, 1$

Net profit for year 2 is given by

$SP_2 - (200 * CP_2 + 0.13 * SP_2) = 296$

$\Longrightarrow 0.87 * SP_2 = 296 + 200 * 2 = 696$

$\Longrightarrow SP_2 = 696 / 0.87 = ₹800 \rightarrow$ (i)

Net profit for year 3 is given by

$SP_3 - (300 * CP_3 = 0.15 * SP_2) = 210$

$\Longrightarrow 0.85 * SP_3 = 210 + 300 * 1 = 510$

$\Longrightarrow SP_3 = 510 / 0.85 = ₹600 \rightarrow$(ii)

(i) ÷ (ii) $\Longrightarrow SP_2 / SP_3 = 800 / 600 = 4 / 3$

Ans: A. 4 : 3

Q43: The number of students in three classes is in the ratio 3:13:6. If 18 students are added to each class, the ratio changes to 15:35:21.

The total number of students in all the three classes in the beginning was: (2021 SET 2)

(a) 22

(b) 66

(c) 88

(d) 110

Ans: (c)

Sol: Let the three classes have 3 x , 13 x and 6 x students respectively. 18 students are added in each class.

After that 3 x + 18 , 13 x + 18 and 6 x + 18 are the number of students in each class.

Given, 3 x + 18 : 13 x + 18 : 6 x + 18 = 15 : 35 : 21

⇒ 3 x + 18 / 6x + 18 = 15 / 21

⇒x + 6 / 2x + 6 = 5 / 7

⇒ 7x + 42 = 10x + 30

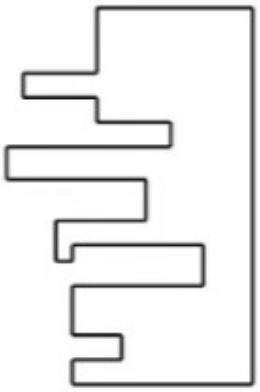
⇒3x = 12

⇒ x = 4

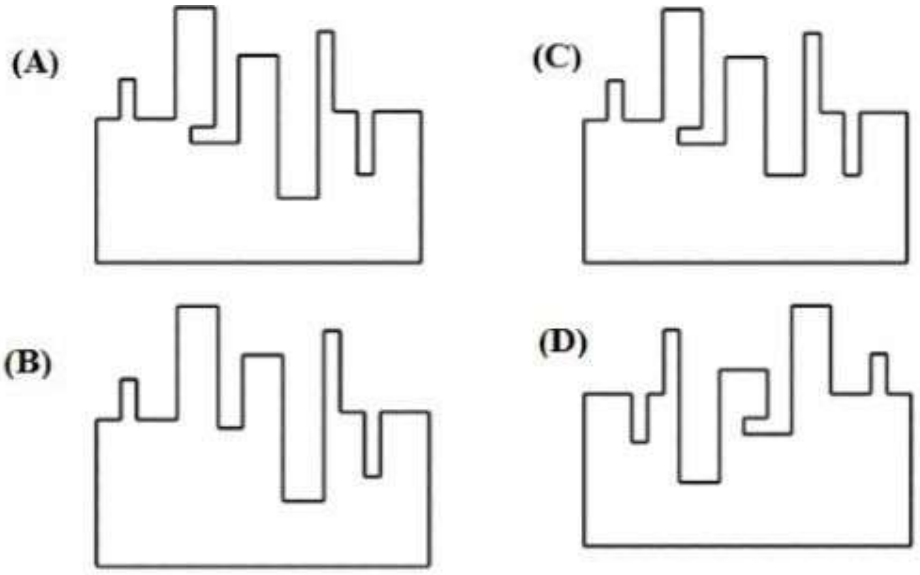
So, the total number of students in all the three classes, in the beginning,

=3 * 4 + 13 * 4 + 6 * 4 = 88.

Q44:



A jigsaw puzzle has 2 pieces. One of the pieces is shown above. Which one of the given options for the missing piece when assembled will form a rectangle? The piece can be moved, rotated or flipped to assemble with the above piece.



(a) A

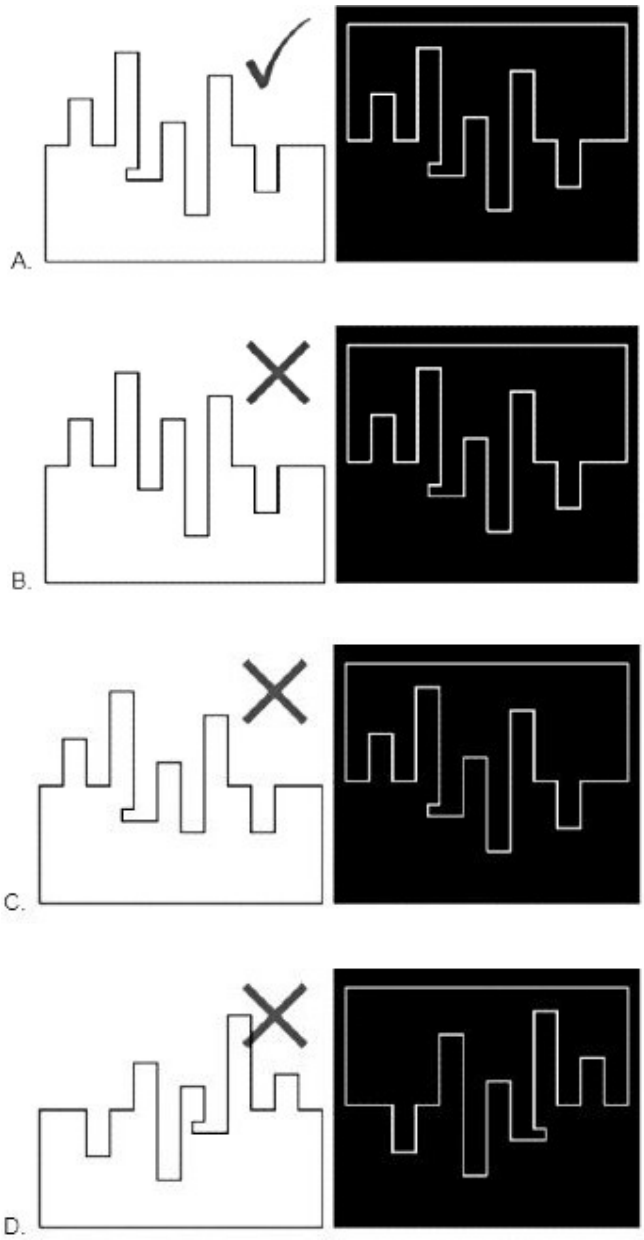
(b) B

(c) C

(d) D

Ans: (a)

Sol:



I have flipped and rotated the image given in the question.

Q45: Listening to music during exercise improves performance and reduces discomfort. Scientists researched whether listening to music while studying can help students learn better and the results were inconclusive. Students who needed external stimulation for studying (2021 SET 2)

fared worse while students who did not need any external stimulation benefited from music.

Which one of the following statements is the CORRECT inference of the above passage?

(a) Listening to music has no effect on learning and a positive effect on physical exercise

(b) Listening to music has a clear positive effect both in physical exercise and on learning

(c) Listening to music has a clear positive effect on physical exercise. Music has a positive effect on learning only in some students

(d) Listening to music has a clear positive effect on learning in all students. Music has a positive effect only in some students who exercise

Ans: (c)

Sol:

1. Listening to music during exercise improves performance and reduces discomfort
2. listening to music while studying can help students learn better and the results were inconclusive.

These two statements suggests that Music listening helps everyone during exercise but we cannot conclude anything on its effect on studying as results were inconclusive. For some students it works, and for some it does not.

Personally for me, it does. :)

Option C is the correct one.

Q46: Pen : Write :: Knife _____ (2021 SET 2)

Which one of the following options maintains a similar logical relation in the above?

(a) Vegetables

(b) Sharp

(c) Cut

(d) Blunt

Ans: (c)

Sol: First and second terms are connected by usage.

pen is used to write.

Similarly knife is used to cut .

Q47: If (x - 1 / 2) ^{2} - (x - 3 / 2) ^{2} = x + 2 then the value of x is: (2021 SET 2)

(a) 2

(b) 4

(c) 6

(d) 8

Ans: (b)

Sol: Given that, (x - 1 / 2) ^{2} - (x - 3 / 2) ^{2} = x + 2

⇒(x- 1 / 2- x + 3 / 2) (x- 1 / 2 + x - 3 / 2) = x + 2 [∴ $a^2 - b^2 = (a - b)(a + b)$]

⇒2x - 2 = x+ 2

⇒ x = 4

So, the correct answer is (B)

Q48: If θ is the angle, in degrees, between the longest diagonal of the cube and any one of the edges of the cube, then, cos θ = (2021 SET 2)

(a) 1 / 2

(b) 1 / √3

(c) 1 / √2

(d) √3 / 2

Ans: (b)

Sol: The longest diagonal would be from one corner vertex to the diagonally opposite corner vertex.

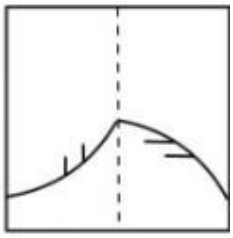
Length of diagonal of a side $\sqrt{a^2 + a^2} = \sqrt{2}a$

The diagonal of a square face of cube, a side of the cube and the longest diagonal will form

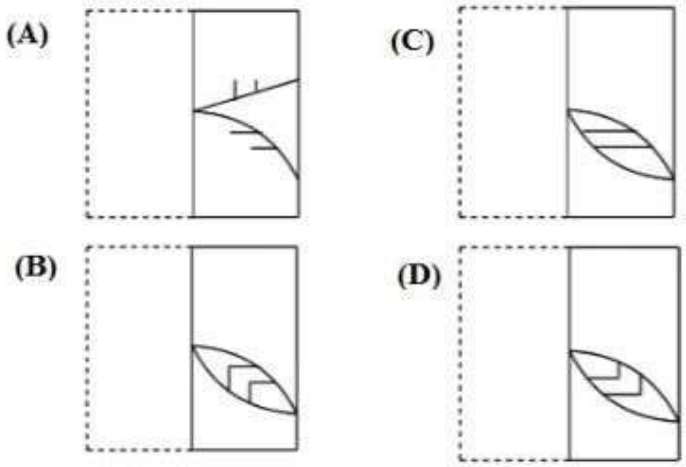
a right angled triangle with longest diagonal as the hypotenuse.∴ Length of the longest diagonal = $\sqrt{a^2 + \left(\sqrt{2}a\right)^2} = \sqrt{3}a$

$\cos\theta = \frac{\text{Base}}{\text{Hypotenues}} = \frac{a}{\sqrt{3}a} = \frac{1}{\sqrt{3}}$

Q49:



A transparent square sheet shown above is folded along the dotted line. The folded sheet will look like_____ (2021 SET 2)



(a) A

(b) B

(c) C

(d) D

Ans: (b)

Sol: The orientation (horizontal/vertical) of lines should not change on folding.

Q50: Gauri said that she can play the keyboard _____ her sister. (2021 SET 2

(a) as well as

(b) as better as

(c) as nicest as

(d) as worse as

Ans: (a)

Sol: as nice as, as good as, as well as, as perfect as, as cute as, as joyful as, as pretty as

All will fit in as all are in their FIRST degree.

Adjective	Comparative	Superlative
good	better	best
bad	worse	worst
little	less	least
much	more	most

Q51: Some people suggest anti-obesity measures (AOM) such as displaying calorie information in restaurant menus. Such measures sidestep addressing the core problems that cause obesity: poverty and income inequality. (2021 SET 2)

Which one of the following statements summarizes the passage?

(a) The proposed AOM addresses the core problems that cause obesity

(b) If obesity reduces, poverty will naturally reduce, since obesity causes poverty

(c) AOM are addressing the core problems and are likely to succeed

(d) AOM are addressing the problem superficially

Ans: (d)

Sol: The passage argues that anti-obesity measures like displaying calorie information on menus do not address the root causes of obesity, which are poverty and income inequality.

The correct summary is

"The proposed measures are addressing the problem superficially."

This option accurately captures the passage's point that while such measures might help, they don't tackle the deeper issues that lead to obesity.

Q52: Given below are two statements 1 and 2, and two conclusions I and II (2021 SET

1)

Statement 1: All bacteria are microorganisms.

Statement 2: All pathogens are microorganisms.

Conclusion I: Some pathogens are bacteria.

Conclusion II: All pathogens are not bacteria.

Based on the above statements and conclusions, which one of the following options is logically CORRECT?

(a) Only conclusion I is correct

(b) Only conclusion II is correct

(c) Either conclusion I or II is correct

(d) Neither conclusion I nor II is correct

Ans: (d)

Sol:

- Statement 1: All bacteria are microorganisms.
- Statement 2: All pathogens are microorganisms.
- Conclusion I: Some pathogens are bacteria.
  Not logically correct as we can draw a Venn diagram satisfying the given statements and where pathogens and bacteria do not intersect.
- Conclusion II: All pathogens are not bacteria.
  This statement means some pathogen is there which is not a bacteria. (Alternatively think of the statement "all students are not rich" which means "there is at least one student who is not rich"). Now, this statement is also not logically correct as we can draw a Venn diagram satisfying the given statements and having all pathogens as bacteria.

Now we already showed that options A and B are wrong.

Option C is ambiguous in the sense that it can mean

1. At least one conclusion is correct (does not make sense as this will automatically make at least one of options A or B correct as well)

2. If conclusion I is not true conclusion II is true and vice versa. In other words both the conclusions cannot be false at the same time. This interpretation makes this option CORRECT.

Option D is correct as individually both the conclusions are not logically correct.
Due to the ambiguity of option C marks were given for both options C and D.

Q53: There are five bags each containing identical sets of ten distinct chocolates. One chocolate is picked from each bag.
The probability that at least two chocolates are identical is _____ (2021 SET 1)
(a) 0.3024
(b) 0.4235
(c) 0.6976
(d) 0.8125
Ans: (c)
Sol: P(No two chocolates are identical) $10\times9\times8\times7\times6 \setminus 10^5 = 30240 / 10^5 = 0.3024$
P(At least two chocolates are identical) = 1-P(No two chocolates are identical)
= 1-0.3024 = 0.6976
Alternatively,
Number of ways of selecting 5 distinct chocolates, one each from the 5 bags is same as selecting
chocolates from 10 distinct ones ${}^{10}C_5$.
If "distinct" requirement is not there, each of the 5 chocolate has 10 options $\Rightarrow 10^5$.
So, probability that no two chocolates are identical = ${}^{10}C_5 / 10^5 = 0.3024$
Probability that at least 2 chocolcates are identical = 1-0.3024 = 0.6976.

Q54:

Items	Cost ($Rs.$)	Profit %	Marked Price ($Rs.$)
P	5,400	– – –	5,860
Q	– – –	25	10,000

Details of prices of two items P and Q are presented in the above table. The ratio of cost of item P to cost of item Q is 3:4. Discount is calculated as the difference between the marked price and the selling price. The profit percentage is calculated as the ratio of the difference between selling price and cost, to the cost (2021 SET 1)
(Profit % = Selling Cost / Cost x 100 %
The discount on item Q, as a percentage of its marked price, is _____
(a) 25
(b) 12.5
(c) 10
(d) 5
Ans: (c)
Sol:
Cost of P / Cost of Q = 3 / 4 = 3 /4 Cost of Q = 7200p
Profit % = Selling price - Cost / Cost x 100
⇒ 25 = SP - 7200 / 7200 X 100 ⇒ SP = 9000
Discount % 1000 - 9000 / 10000 X100 = 10%

Q55: We have 2 rectangular sheets of paper, M and N, of dimensions 6 cm x 1 cm each. Sheet M is rolled to form an open cylinder by bringing the short edges of the sheet together. Sheet N is cut into equal square patches and assembled to form the largest possible closed cube. Assuming the ends of the cylinder are closed, the ratio of the volume of the cylinder to that of the cube is ___(2021 SET 1)
(a) π / 2
(b) 3 / π
(c) 9 / π
(d) 3 / π
Ans: (c)
Sol: Sheet M is rolled to form an open cylinder by bringing the shorter edge of the sheet together
So the longer side becomes the circumference of the base of the cylinder and shorter side

becomes the height.

$\therefore 2 \times \pi \times r = 6 \Longrightarrow r = 3 / \pi$

Volume of Cyclinder = $\pi \times r^2 \times h = \pi \times (3 / \pi)^2 \times 1 = 9 / \pi$

Sheet N is cut into equal square patches and assembled to form the largest possible closed cube

So the entire area of the sheet is converted into surface area of the cube, i.e.

$6 \times a^2 = 6 \times 1 \Rightarrow a^2 = 1 \Rightarrow a = 1$

Volume of cube $a^3 = (1)^3 = 1$

Volume of Cyclinder / Volume of cube = $2 \frac{\frac{9}{\pi}}{1} = \frac{9}{\pi}$

Q56: _____ is to surgery as writer is to _____ (2021 SET 1)

Which one of the following options maintains a similar logical relation in the above sentence?

(a) Plan, outline

(b) Hospital, library

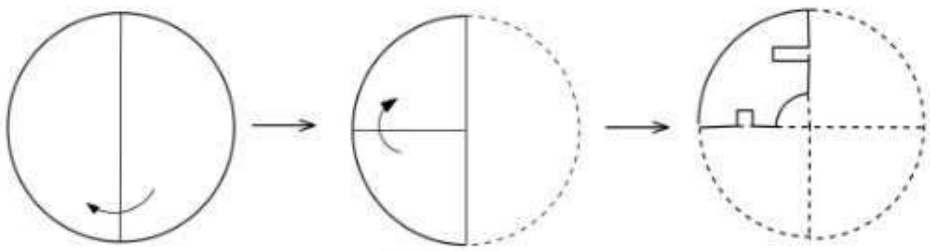
(c) Doctor, book

(d) Medicine, grammar

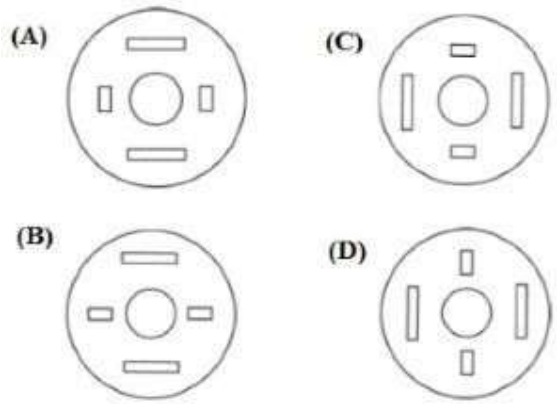
Ans: (c)

Sol: A doctor performs a surgery, and a writer writes a book.

Q57:



A circular sheet of paper is folded along the lines in the direction shown. The paper, after being punched in the final folded state as shown and unfolded in the reverse order of folding, will look like _____. (2021 SET 1)



(a) A

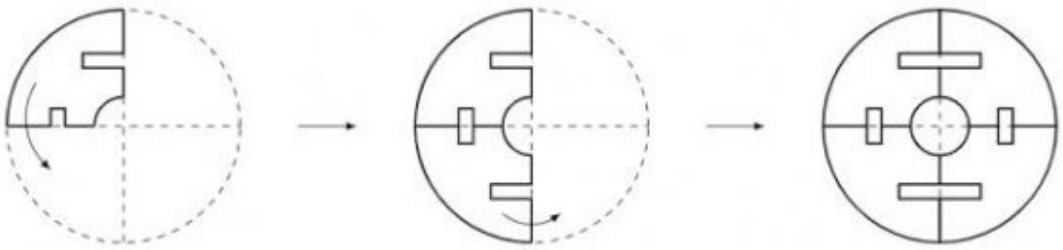
(b) B

(c) C

(d) D

Ans: (a)

Sol: Unfold the paper sheet back.



Q58: Consider the following sentences: (2021 SET 1)

i. Everybody in the class is prepared for the exam.

ii. Babu invited Danish to his home because he enjoys playing chess.

Which of the following is the CORRECT observation about the above two sentences?

(a) (i) is grammatically correct and (ii) is unambiguous

(b) (i) is grammatically incorrect and (ii) is unambiguous

(c) (i) is grammatically correct and (ii) is ambiguous

(d) (i) is grammatically incorrect and (ii) is ambiguous

Ans: (c)

Sol: (i) "Everybody in the class is prepared for the exam."

The above statement is correct as when we say everybody or everyone, we are considering the class as a unit. So singular form of the verb "is" is correct.

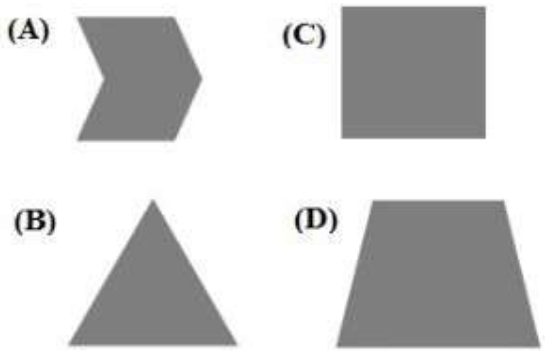
(ii) "Babu invited Danish to his house because he enjoys playing chess."

The above statement is ambiguous because we are not sure who "he" refers to - it can be either Babu or Danish.

Option C follows from the above.

Q59: A polygon is convex if, for every pair of points, P and Q belonging to the polygon, the line segment PQ lies completely inside or on the polygon. (2021 SET 1)

Which one of the following is NOT a convex polygon?



(a) A

(b) B

(c) C

(d) D

Ans: (a)

Sol: Option A is not a convex polygon as if we choose P and Q on the left-most tail the line segment PQ will not be inside the polygon.

Q60: The ratio of boys to girls in a class is 7 to 3. (2021 SET 1)

Among the options below, an acceptable value for the total number of students in the

class is:

(a) 21

(b) 37

(c) 50

(d) 73

Ans: (c)

Sol: The number of boys is a multiple of 7 i.e., 7 M , for some integer M .

The number of girls is a multiple of 3 i.e., 3 M .

∴ The total number of students = 7 M + 3 M = 10 M , i.e., a multiple of 10.

Only option that fits is C.

Q61: The total revenue of a company during 2014 - 2018 is shown in the bar graph. If the total expenditure of the company in each year is 500 million rupees, then the aggregate profit or loss (in percentage) on the total expenditure of the company during 2014 - 2018 is _____. (2020)

(a) 16.67% profit

(b) 16.67% loss

(c) 20% profit

(d) 20% loss

Ans: (c)

Sol: Total expenditure during each year = 500 million rupees

Total expenditure for 5 years = 500 × 5 = 2500 million rupees

- Revenue in 2014 = 500 million rupees
- Revenue in 2015 = 700 million rupees
- Revenue in 2016 = 800 million rupees
- Revenue in 2017 = 600 million rupees
- Revenue in 2018 = 400 million rupees

Total revenue = 500 + 700 + 800 + 600 + 400 = 3000 million rupees

Profit = 3000 - 2500 = 500 million rupees

Profit percentage = (500 / 2500) X 100 = 20%

Q62: Two straight lines are drawn perpendicular to each other in X-Y plane. If α and βare the acute angles the straight lines make with the X-axis, then α + β is_____.

(a) 60°

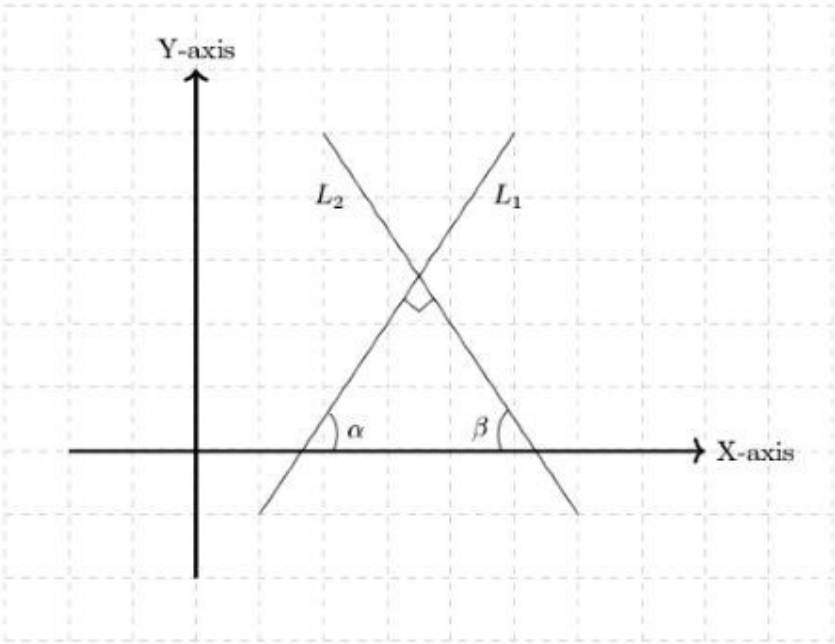
(b) 90°

(c) 120°

(d) 180°

Ans: (b)

Sol:



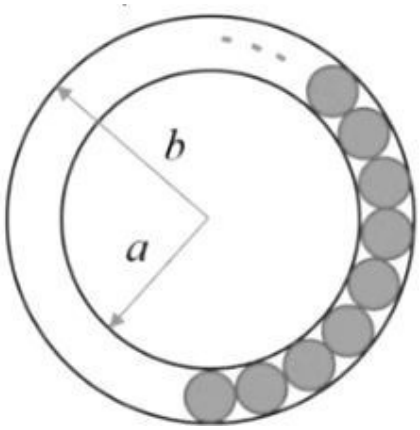
Here, we can clearly see that Two Lines L_1 and L_2 are intersecting each other at the right angle.

Now we also know that in a triangle, the sum of three angles is

- $\angle A + \angle B + \angle C = 180^\circ$
- $\alpha + \beta + 90^\circ = 180^\circ$
- $\alpha + \beta = 90^\circ$

The answer is (B).

Q63: The figure below shows an annular ring with outer and inner as b and a, respectively. The annular space has been painted in the form of blue colour circles touching the outer and inner periphery of annular space. If maximum n number of circles can be painted, then the unpainted area available in annular space is _____. (2020)



(a) $\pi [(b^2 - a^2) - n / 4(b - a)^2]$

(b) $\pi [(b^2 - a^2) - n (b - a)^2]$

(c) $\pi [(b^2 - a^2) + n / 4(b - a)^2]$

(d) $\pi [(b^2 - a^2) + n (b - a)^2]$

Ans: (a)

Sol: We need to find the area of the ring first.

Area of Ring = Area of Outer Circle - Area of Inner Circle

$= \pi b^2 - \pi a^2 = \pi b^2 - a^2$

Now From this ring area we have to subtract the small 'n' circles

Area of n Circles = $(\pi d^2 / 4 * n (\pi(b - a)^2 / 4 * n$

The Required Unpainted Area =Ring Area - Area of Small 'n' such Circles

$= \pi (b^2 - a^2) - (\pi d^2 / 4) * n$

$= \pi (b^2 - a^2) - n / 4 (b - a)^2]$

Q64: If P=3, R=27, T=243, then Q + S = _____ (2020)

(a) 40

(b) 80

(c) 90

(d) 110

Ans: (c)

Sol: We can interpret the given order as:

- $P \rightarrow 3^1 = 3$
- $Q \rightarrow 3^2 = 9$
- $R \rightarrow 3^3 = 27$
- $S \rightarrow 3^4 = 81$
- $T \rightarrow 3^5 = 243$
- $Q + S \rightarrow 9 + 81 = 90$

Hence Option (C) is correct

Q65: Goods and Services Tax (GST) is an indirect tax introduced in India in 2017 that is imposed on the supply of goods and services, and it subsumes all indirect taxes except few. It is a destination-based tax imposed on goods and services used, and it is not imposed at the point of origin from where goods come. GST also has a few components specific to state governments, central government and Union Territories (UTs). (2020)

Which one of the following statements can be inferred from the given passage?

(a) GST is imposed on the production of goods and services.

(b) GST includes all indirect taxes.

(c) GST does not have a component specific to UT.

(d) GST is imposed at the point of usage of goods and services.

Ans: (d)

Sol: Let us look at some important points given in the paragraph

1. GST is imposed on supply of goods and services
2. It subsumes all indirect taxes except few
3. It is a destination based tax implied on goods used
4. It is not imposed at point of origin from where good comes
5. GST also has few components specific to state government , central government and union territories

Now we can eliminate the options based on above points

A. GST is imposed on production of goods and services

Area of n CirclesIt is FALSE due to point 1 . To make it correct, in place of production it should be supply

B. GST includes all indirect taxes.

It is FALSE due to point 2 due to except few words

C. GST does not have component specific to UT

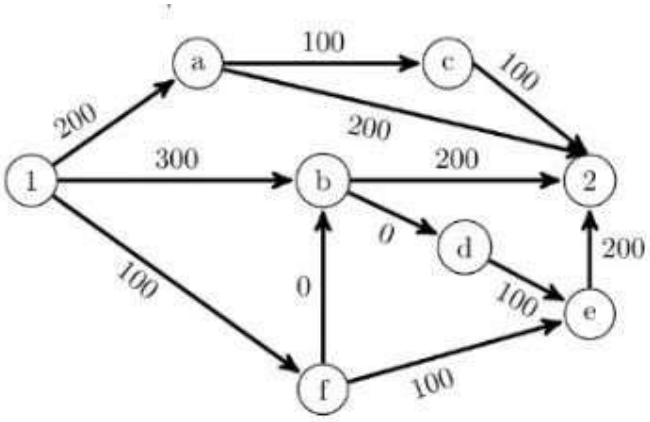
It is FALSE due to point 5 since it has few components specific to UT.

D. GST is imposed at point of usage of goods and services.

It is TRUE due to point 3 . we can relate point of usage to goods used at destination

Hence Option D is the correct option.

Q66: There are multiple routes to reach from node 1 to node 2, as shown in the network. (2020)



The cost of travel on an edge between two nodes is given in rupees. Nodes 'a', 'b', 'c', 'd', 'e', and 'f' are toll booths. The toll price at toll booths marked 'a' and 'e' is Rs. 200, and is Rs. 100 for the other toll booths. Which is the cheapest route from node 1 to node 2?

(a) 1 - a - c - 2

(b) 1 - f - b - 2

(c) 1 - b - 2

(d) 1 - f - e - 2

Ans: (b)

Sol: A) 1 - a - c - 2 :

- 1 - a = 200
- Tax at a = 200
- a - c = 100
- Tax at c = 100
- c - 2 : 100
- Total = 200 + 200 + 100 + 100 + 100 = 700

B) 1 - f - b - 2 :

- 1 - f = 100
- Tax at f = 100
- f - b = 0
- Tax at b = 100
- b - 2 : 200

- Total = 100 + 100 + 0 + 100 + 200 = 500

C) 1 - b - 2 :

- 1 - b = 300
- Tax at b = 100
- b - 2 : 200
- Total = 300 + 100 + 200 = 600

D) 1 - f - e - 2 :

- 1 - f = 100
- Tax at f = 100
- f - e = 100
- Tax at e = 200
- e - 2 : 200
- Total = 100 + 100 + 200 + 200 = 700

Cheapest route = 1 - f - b - 2

Correct Option: B

Q67: The dawn of the 21st century witnessed the melting glaciers oscillating between giving too much and too little to billions of people who depend on them for fresh water. The UN climate report estimates that without deep cuts to man-made emissions, at least 30% of the northern hemisphere's surface permafrost could melt by the end of the century. Given this situation of imminent global exodus of billions of people displaced by rising seas, nation-states need to rethink their carbon footprint for political concerns, if not for environmental ones. (2020)

Which one of the following statements can be inferred from the given passage?

(a) Nation-states do not have environmental concerns.

(b) Nation-states are responsible for providing fresh water to billions of people

(c) Billions of people are responsible foe man-made emissions.

(d) Billions of people are affected by melting glaciers.

Ans: (d)

Sol:

A. Nation-states do not have environmental concerns.

The only statement in the given passage referring to nation-states is "nation-states need to rethink their carbon footprint". But this does not imply that nation-states do not have environmental concerns.

B. Nation-states are responsible for providing fresh water to billions of people.

Like the previous statement this is also not said anywhere in the given passage

C. Billions of people are responsible for man-made emissions.

"nation-states need to rethink their carbon footprint" - means nation-states are responsible for man-made emissions but it does not mean "billions of people" - could be a few hundreds or thousands.

D. Billions of people are affected by melting glaciers.

"situation of imminent global exodus of billions of people displaced by rising seas" clearly implies this.

Correct option: D.

Q68: Select the word that fits the analogy: (2020)

Cook : Cook :: Fly : _____

(a) Flyer

(b) Flying

(c) Flew

(d) Flighter

Ans: (a)

Sol: Relation here is Verb: Noun. One who cooks is a cook and one who flies any aircraft is a flyer.

Q69: His knowledge of the subject was excellent but his classroom performance was ___ _.

(a) extremely poor

(b) good

(c) desirable

(d) praiseworthy

Ans: (a)

Sol: A. Extremely poor

Conjunctions like although, however, but, though, in spite of, despite etc. create contrast between two parts of a sentence.

Here, the person has an $\underbrace{\text{excellent knowledge}}_{\text{positive}}$ of subject but his performance was $\underbrace{\text{extremely poor.}}_{\text{negative}}$

Q70: Raman is confident of speaking English _____ six months as he has been practising regularly_____the last three weeks. (2020)

(a) during, for

(b) for, since

(c) for, in

(d) within, for

Ans: (d)

Sol: 'within' is used to state that something will occur in a specified time period.

The second blank is interesting with respect to for vs since.

The preposition 'for' is used with a period of time specifying the length of time (two years, one week, etc) whereas 'since' is used to refer to a time period from a specific point in time (last year, 2010, etc)

First blank itself is sufficient to eliminate all incorrect options.

Correct option is D.

Q71: Three of the five students are allocated to a hostel put in special requests to the warden, Given the floor plan of the vacant rooms, select the allocation plan that will

accommodate all their requests. (2019)

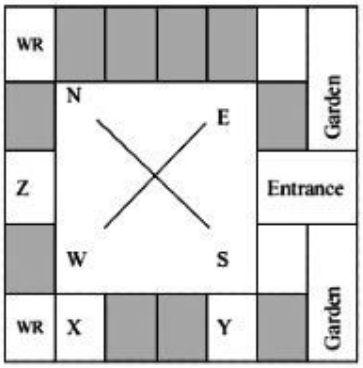
Request by X: Due to pollen allergy, I want to avoid a wing next to the garden.

Request by Y: I want to live as far from the washrooms as possible, since I am very mich sensitive to smell.

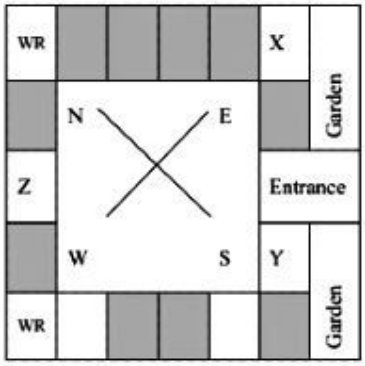
Request by Z: I believe in Vaastu and so I want to stay in South-West wing.

The shaded rooms are already occupied. WR is washroom

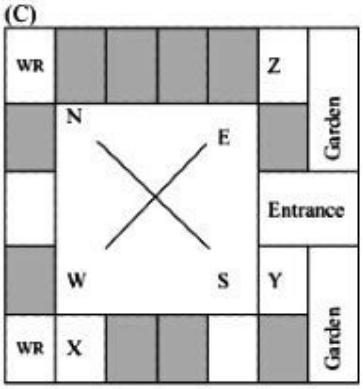
(A)



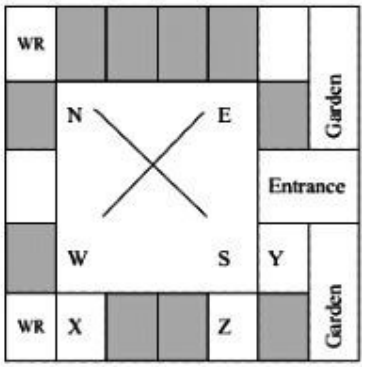
(B)



(C)



(D)



(a) A

(b) B

(c) C

(d) D

Ans: (d)

Sol: Only in option D, we see that that Z has been assigned in S-W zone. Hence no scope of confusion with other options.

Moreover X and Y's requests have also been satisfied : X has not been assigned close to the garden.

Y has not been assigned close to the washroom.

Q72: In a college, there are three student clubs, 60 students are only in the Drama club, 80 students are only in the Dance club, 30 students are only in Maths club, 40 students are in both Drama and Dance clubs, 12 students are in both Dance and Maths clubs, 7 students are in both Drama and Maths clubs, and 2 students are in all clubs. If 75% of the students in the college are not in any of these clubs, then the total number of students in the college is _____. (2019)

(a)1000

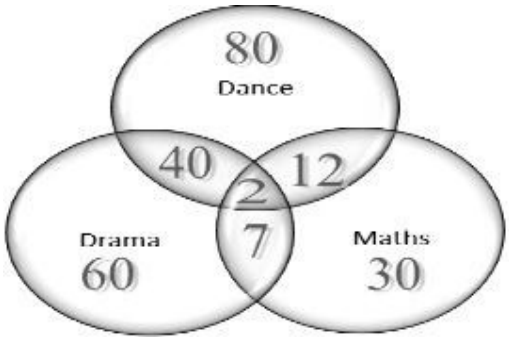
(b) 975

(c) 900

(d) 225

Ans: (c)

Sol:



Read question carefully. We cannot directly use the formula

$P(A \cup B \cup C) = P(A) + P(B) + P(C) - P(A \cap B) - P(B \cap C) - P(C \cap A) + P(A \cap B \cap C)$

because of the only keyword which means we do not directly know what is $P(A)$, $P(B)$ or $P(C)$

Here, according to question statement, we can calculate total number of students belonging to at least one club :

$P(A \cup B \cup C) = 60 + 80 + 30 + (40 - 2) + (12 - 2) + (7 - 2) + 2 = 225$

This is just 25 % of the total no of students since 75 % do not belong to any club.

So, total number of students = 225 / 25% = 225 x 4 = 900.

Q73: "A recent High Court judgement has sought to dispel the idea of begging as a disease - which leads to its stigmatization and criminalization - and to regard it as a symptom. The underlying disease is the failure of the state to protect citizens who fall through the social security net." (2019)

Which one of the following statements can be inferred from the given passage?

(a) Beggars are lazy people who beg because they are unwilling to work

(b) Beggars are created because of the lack of social welfare schemes

(c) Begging is an offence that has to be dealt with firmly

(d) Begging has to be banned because it adversely affects the welfare of the state

Ans: (b)

Sol: The last sentence of the text mentions

the underlying disease(cause) is the failure of state to protect citizens who fall through the social security net.

which means beggars are created due to lack of social welfare schemes by the state.

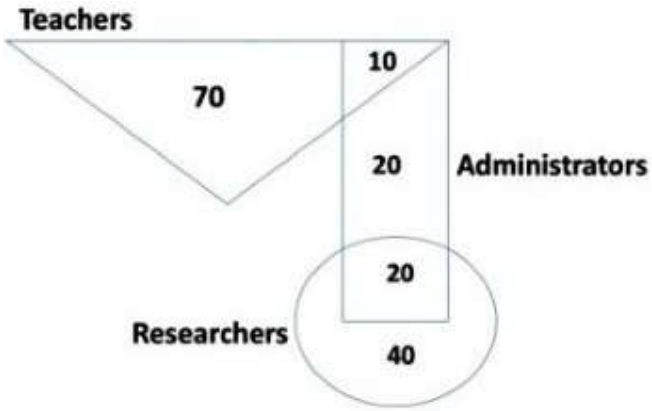
A. Beggars are lazy people who beg because they are unwilling to work - may or may not be true but cannot be inferred from the passage.

B. Beggars are created because of the lack of social welfare schemes - Can be inferred from the last sentence.

C. Begging is an offense that has to be dealt with firmly - It is given that High Court dispelled the idea of treating begging as an offense.

D. Begging has to be banned because it adversely affects the welfare of the state - may or may not be true but cannot be inferred from the passage.

Q74: In the given diagram, teachers are represented in the triangle, researchers in the circle and administrators in the rectangle. Out of the total number of the people, the percentage of administrators shall be in the range of (2019)



(a) 0 to 15

(b) 16 to 30

(c) 31 to 45

(d) 46 to 60

Ans: (c)

Sol: → No of administrator = 10 + 20 + 20 = 50

→ Total no of person = 80 + 20 + 20 + 40 = 160

→ Required % = (50 / 160) ∗ 100 = 31.25 %

∴ Option C . 31 to 45 is the correct answer.

Q75: The police arrested four criminals - P, Q, R and S. The criminals knew each other. They made the following statements: (2019)

P says "Q committed the crime."

Q says "S committed the crime."

R says " I did not do it."

S says "What Q said about me is false".

Assume only one of the arrested four committed the crime and only one of the statements made above is true. Who committed the crime

(a) P

(b) R

(c) S

(d) Q

Ans: (b)

Sol: Assuming S is saying the truth.

P says Q committed the crime (FALSE) means Q has not

Q says S committed the crime(FALSE) means S has not

R says I did not (FALSE) means R has committed the crime.

Q76: A court is to a judge as_____ is to a teacher. (2019)

(a) a student

(b) a punishment

(c) a syllabus

(d) a school

Ans: (d)

Sol: A court is a place where the judge works, school is a place where a teacher works.

D. School

Q77: Ten friends planned to share equally the cost of buying a gift for their teacher. When two of them decided not to contribute, each of the other friends had to pay Rs. 150 more. The cost of the gift was Rs (2019)

(a) 666

(b) 3000

(c) 6000

(d) 12000

Ans: (c)

Sol: Let us suppose each of the 10 friends were supposed to contribute Rs x .

Hence total cost for gift = Rs 10 x .

Now since 2 friends won't contribute , hence 8 friends would have to contribute (x + 150) each.

By the sum,

10x = 8x + 1200

⇒ 2x = 1200

⇒ x = 600

Q78: Two cars at the same time from the same location and go in the same direction. The speed of the first car is 50 km/h and the speed of the second car is 60 km/h. The number of hours it takes for the distance between the two cars to be 20 km is _. (2019)

(a) 1

(b) 2

(c) 3

(d) 6

Ans: (b)

Sol: Let the required distance be reached at time T . Let Speed be (S 1 = 60 , S 2 = 50)

According to the Question →D1 - D2 = 20

∴ (60 * T) - (50 * T) = 20

T = 2

Q79: The search engine's business model ____ around the fulcrum of trust. (2019)

(a) revolves

(b) plays

(c) sinks

(d) bursts

Ans: (a)

Sol: the actual meaning of Revolves in this context is to 'treat as the most important element'.

So the above meaning of the sentence goes:

The business model of any search engine is entirely dependent on trust.

OR

Trust is the most important factor of the business model of any search engine.

option A. Revolves

Q80: The expenditure on the project _____ as follows: equipment Rs.20 lakhs, salaries Rs.12 lakhs, and contingency Rs.3 lakhs. (2019)

(a) break down

(b) break

(c) breaks down

(d) breaks

Ans: (c)

Sol: → Break down means to separate something into smaller parts.

→ The subject-word agreement states that

Singular nouns go with singular verbs while plural nouns go with plural verbs.

→ Expenditure is singular noun and its plural form is expenditures.

The expenditure (singular noun) in the project breaks (singular verb used in the phrase) down as follows

→ The above statement satisfies the subject verb agreement and hence, the correct option is

Q81: A six sided unbiased die with four green faces and two red faces is rolled seven times. Which of the following combinations is the most likely outcome of the experiment? (2018)

(a) Three green faces and four red faces.

(b) Four green faces and three red faces.

(c) Five green faces and two red faces.

(d) Six green faces and one red face

Ans: (c)

Sol: We can calculate the probability of each of the options but by logic we can easily eliminate the ones with more number of

red faces - option A can be avoided without any calculation.

$$A = P(3G, 4R) = {}^7C_3 . \left(\frac{4}{6}\right)^3 \left(\frac{2}{6}\right)^4$$

$$B = P(4G, 3R) = {}^7C_4 . \left(\frac{4}{6}\right)^4 \left(\frac{2}{6}\right)^3$$

$$C = P(5G, 2R) = {}^7C_5 . \left(\frac{4}{6}\right)^5 \left(\frac{2}{6}\right)^2$$

$$D = P(6G, 1R) = {}^7C_6 . \left(\frac{4}{6}\right)^6 \left(\frac{2}{6}\right)^1$$

Option A is clearly smaller and hence eliminated.

C / B = $\frac{{}^7C_5}{{}^7C_4}$ · 4 / 6 · 6 / 2 = 3 / 5 · 2 > 1.

So, C > B

C / D $\frac{{}^7C_5}{{}^7C_6}$ · 6 / 4 · 2 / 6

So, C > D

Hence, C is the most favourable outcome.

Q82: Question 82 In the figure below, ∠ D E C + ∠ B F C is equal to_____ (2018)

(a) ∠ B C D - ∠ B A D

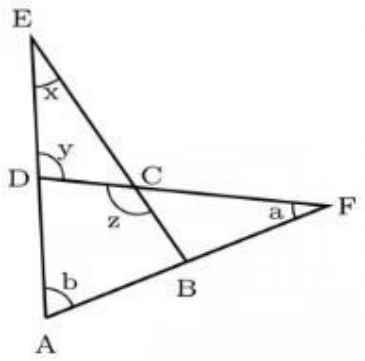
(b) ∠ B A D + ∠ B C F

(c) ∠ B A D + ∠ B C

(d) ∠CBA+∠ADC

Ans: (a)

Sol:



$\angle z = \angle x + \angle y$

This is a triangle property that tells us that "the exterior angle of a triangle is the sum of the two opposite interior angle."

Similarly,

$\angle y = \angle a + \angle b$

By substituting, we get,

$\angle Z = \angle x + \angle a + \angle b$.

Now $\angle Z = \angle B C D$

$\angle b = \angle B A D \angle B C D - \angle B A D = \angle Z - \angle b = \angle x + \angle a + \angle b - \angle b = \angle x + \angle a = \angle D E C + \angle B F C$

So, option A is the answer.

Q83: In a party, 60% of the invited guests are male and 40% are female. If 80% of the invited guests attended the party and if all the invited female guests attended, what would be the ratio of males to females among the attendees in the party? (2018)

(a) 2:03

(b) 1:01

(c) 3:02

(d) 2:01

Ans: (c)

Sol: Assume 100 people are invited, so 60 men and 40 women invited.

During the party only 80 people showed up, and since all women attended ⇒ 80 = 40 + men

Therefore, men = 40

men : women = 1 : 1

Correct Answer: B

Q84: If p q r ≠ 0 pq^{-r} 1 / q , q^{-y} = 1 / r , r^{-z} = 1 / p ,what is the value of the product x y z ?

(a) -1

(b) 1 / pqr

(c) 1

(d) pqr

Ans: (c)

Sol: Given: p + q + r = p × q × r = 1 / p + 1 / q + 1 / r = 1

Formula used:

$(a + b + c)^2 = a^2 + b^2 + c^2 + 2 \times (ab + bc + ca)$

$a^3 + b^3 + c^3 = (a + b + c) \times (a^2 + b^2 + c^2 - ab - bc - ca) + 3abc$

Calculation:

1 / p + 1 / q + 1 / r = 1

⇒ (qr + pr + pq)/pqr = 1

⇒ (qr + pr + pq) = 1

p + q + r = 1

squaring both sides:

⇒ (p + q + r)2 = 12

$\Rightarrow p^2 + q^2 + r^2 + 2 \times (pq + qr + pr) = 1$

$\Rightarrow p^2 + q^2 + r^2 + 2 \times 1 = 1$

$\Rightarrow p^2 + q^2 + r^2 = 1 - 2 = -1$

$p^3 + q^3 + r^3 = (p + q + r) \times (p^2 + q^2 + r^2 - pq - qr - pr) + 3pqr$

⇒ 1 × (- 1 - 1) + 3

⇒ - 2 + 3 = 1

∴ The correct answer is 1.

Q85: In appreciation of the social improvements completed in a town, a wealthy philanthropist decided to gift Rs. 750 to each male senior citizen in the town and Rs. 1000 to each female senior citizen. Altogether, there were 300 senior citizens eligible for this gift. However, only 8 / 9 th of the eligible men and 2 / 3 rd of the eligible women claimed the gift. How much money (in Rupees) did the philanthropist give away in total? (2018)

A 1,50,000

B 2,00,000

C 1,75,000

D 1,51,000

Ans: (b)

Sol: Let no. of senior male be x

Let no. of senior female be y

$x + y = 300$

Total money given = $(8x / 9 \text{ X } 750 = 2000x / 3) + (2y / 3 \text{ X } 1000 = 2000x / 3)$

$= 2000 / 3 \text{ X } (x + y)$

$= 2000 / 3 \text{ X } 300$

$=200000.$

So, B is correct.