1. When a thick glass slab is placed over a printed matter, the printed matter appears _____ and this is due to the _____ of light.
(a) Raised; Refraction
(b) Depressed; Reflection
(c) Depressed; Refraction
(d) Raised; Reflection **[a]**

Explanation –
When light passes from one medium to another (such as from glass to air or from air to glass), its speed changes, due to which it changes its direction. This phenomenon is called refraction.
When you place a thick glass slab over a printed matter, the light coming from the printed letter enters from glass to air. In this process, refraction of light takes place. Due to refraction, your eyes see the printed letters slightly raised from their actual position. This is based on the same principle due to which a pencil kept in water appears bent.

2. If A means – C means ×, and D means ÷, then what will come in place of question mark (?) in the following equation?
10 B 27 D 9 A 4 C 3 = ?
(a) 18
(b) 20
(c) 19
(d) 17 **[c]**

व्याख्या : 10B27D9A4C3= ?
according to question
10-27÷9+4×3 = ?
10-3+12= ?
19 = ?

3. Look at the following series of numbers and symbols and answer the question given below. Numbers and symbols should be counted from left to right only.
(Left) 7 8 & $ & 2 @ % 4 6 3 Ω £ 5 1 9 # * (Right)
How many such numbers are there in the above series, each of which is immediately preceded by a symbol and also immediately followed by a symbol?
(a) शून्य /Zero
(b) एक /One
(c) दो से अधिक /More than two
(d) दो/Two **[b]**

व्याख्या :
(Left) 7 8 & $ & 2 @ % 4 6 3 Ω £ 5 1 9 # * (Right)
In the above series the number having symbol before the number and symbol after the number is only one & & 2 @.

4. If the perimeter of one face of a cube is 48 cm, find its volume.
(a) 1728 cm^3
(b) 729 cm^3
(c) 512 cm^3
(d) 1024 cm^3 **[a]**

व्याख्या :
Given,
The perimeter of one face of a cube is 48 cm.
According to the formula,
Perimeter of one face of cube = 4a
4a = 48
a= 12 cm
Volume of cube = $(side)^3$
= $(12)3=1728\ cm^3$

5. A cubic wooden block of side 2 m is placed on a table. If the mass of the wooden block is 10 kg, then what will be the pressure exerted by the wooden block on the table? (If g = 10 m/s^2)
(a) 30 N m^{-2}
(b) 20 N m
(c) 15 N m^{-2}
(d) 25 N m^{-2} **[d]**

Explanation -
Pressure (P) = Force (F) / Area (A)
Force = Mass × Acceleration
F = ma
m = 10 kg
g = 10 m/s^2
F = 10 kg × 10 m/s^2 = 100 N
Area (A) is the area over which the block is applying force on the table. Since the block is cubic and one side is 2 m, the contact area is:
A = $(side)^2$
A = $(2)^2$ = 4 m^2
Calculation of pressure:
P = F / A
P = 100 N / 4 m^2
P = 25 N m^{-2}
Therefore, the pressure exerted by the wooden block on the table will be 25 N m^{-2}.

6. Look at the following series of numbers and symbols and answer the question given below. Numbers and symbols should be counted from left to right only.
(left) @ 6 8 $ 9 # 1 * £ 4 7 & 2 & % 3 Ω 5 (right)
How many such numbers are there in the above series, each of which is immediately preceded by a number and immediately followed by a symbol?
(a) Zero
(b) more than two

(c) Two
(d) One [c]

व्याख्या :

(left) @ 6 8 $ 9 # 1 * £ 4 7 & 2 & % 3 Ω 5 **(right)**

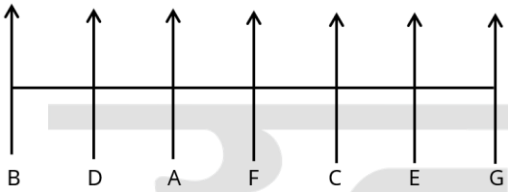
In the above series there are two numbers with a symbol before the number and a symbol after the number 6 8 $ 4 7 &

7. Seven people, A, B, C, D, E, F and G are sitting in a row, facing north. Only two people sit to the right of C. Only two people sit between D and C. A sits to the immediate right of D. E sits to the immediate left of G. B sits second to the left of A.

How many people sit between B and F?

(a) Two
(b) Three
(c) Four
(d) One [a]

व्याख्या :



It is clear from the diagram that only two persons (D,A) sit between B and F.

8. A shopkeeper buys an item for ₹ 319.60. At what approximate price should he sell the item to earn a profit of 25%?

(a) ₹450
(b) ₹600
(c) ₹400
(d) ₹500 [c]

व्याख्या :

Given

The purchase price of the item for the shopkeeper = Rs 319.60

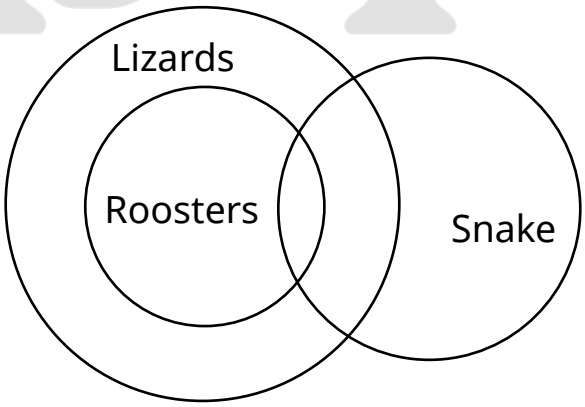
For how much should the item be sold to earn a profit of 25%

$= 319.60 \times \frac{125}{100} = 399.5 \approx 400$ Rupees

9. Read the statements and conclusions given below carefully. You have to assume that the given statements are true even if they seem to be at variance from commonly known facts and decide which of the given conclusions logically follows from the given statement/statements.

Statements:
Some snakes are lizards.
All chickens are lizards.
Conclusions:
(I) All lizards are chickens.
(II) No chickens are snakes.
(a) Only conclusion (II) follows.
(b) Neither conclusion (I) nor (II) follows.
(c) Only conclusion (I) follows.
(d) Both conclusions (I) and (II) follow. [b]

व्याख्या :



It is clear from the diagram that neither conclusion I nor II follows.

10. An object is placed at a distance of 20cm in front of a concave mirror and its image is formed at a distance of 60cm from the mirror in the direction of the object, what will be the magnification produced by the mirror?

(a) - 3
(b) + 1/3
(c) - 1/3
(d) +3 [a]

Explanation –

Magnification (M) = - (Image distance (v) / Object distance (u))

It is important to use the sign convention for concave mirror:

Object distance (u): The object is placed in front of the mirror, so u will be negative.

u = -20 cm

Image distance (v): The image is formed at a distance of 60 cm from the mirror in the direction of the object. This means the image is formed in front of the mirror, which is the case for a real image. So, v will also be negative.

v = -60 cm

Calculation of magnification:

m = - (v / u)

m = - (-60 cm / -20 cm)

m = - (60 / 20)

m = -3

Therefore, the magnification produced by the mirror will be -3. The negative sign indicates that the image is real and inverted.

11. As per the Indian Union Budget 2024-25, the government allocated _____ crores for schemes like 'Sambal', up from ₹462 crores in the previous fiscal year.

(a) ₹629 crore
(b) ₹756 crore
(c) ₹453 crore
(d) ₹523 crore **[a]**

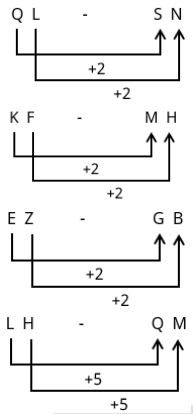
व्याख्या –

In the Union Budget 2024-25, an allocation of ₹629 crore has been made to the Sambal sub-scheme under the Mission Shakti scheme operated under the Ministry of Women and Child Development. This amount has been increased from ₹462 crore in the previous financial year, which shows an increase of about 36%. Women safety programs like Beti Bachao Beti Padhao, One Stop Center are included under this scheme.

12. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which pair does not belong to that group?
(Note: The odd letter-cluster is not based on the number of consonants/vowels or their position in that letter-cluster.)

(a) QL-SN
(b) KF-MH
(c) EZ-GB
(d) LH-QM **[d]**

व्याख्या :



Hence, 'LH-QM' is different from others.

13. Which of the following is an example of a heterogeneous mixture?

(a) Salt dissolved in water
(b) Oil dissolved in water
(c) Powdered copper sulphate dissolved in water
(d) Sugar dissolved in water **[b]**

Explanation –

Heterogeneous Mixture: A mixture in which the components are not mixed uniformly, and you can see their separate components. These have two or more phases.

Oil dissolved in water: Oil is insoluble in water. When you mix oil with water, the oil droplets float in the water or form separate layers. You can see the oil and water clearly separately, which makes it a heterogeneous mixture.

Salt dissolved in water: When salt dissolves in water, it dissolves completely and forms a uniform mixture (homogeneous mixture). You cannot see the salt particles separately.

Powdered copper sulphate dissolved in water: Copper sulphate is easily soluble in water and forms a blue solution. It is a homogeneous mixture because the copper sulphate particles are completely dispersed in water.

Sugar dissolved in water: Sugar forms a sweet, clear solution when dissolved in water. It is a homogeneous mixture because the sugar particles are completely dissolved in water.

14. What is the product of (x + a) and (x + b)?

(a) $x^2 + (a - b)\,x + ab$
(b) $x^2 + (a - b)\,x - ab$
(c) $x^2 + (a + b)\,x + ab$
(d) $x^2 + (a + b)\,x - ab$ **[c]**

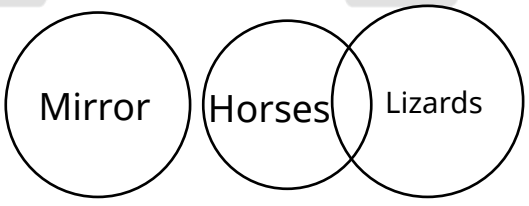
व्याख्या :

Product of (x+a) and (x+b)
$= x(x+b) + a\,(x+b)$
$= x^2 + bx + ax + ab$
$= x^2 + (a+b)x + ab$

15. Read the statements and conclusions given below carefully. You have to assume that the given statements are true even if they seem to be at variance from commonly known facts and decide which of the given conclusions logically follows from the given statement/statements.

Statements:
No horses are mirrors. Some lizards are horses.
Conclusions:
(I) Some horses are not lizards.
(II) Some lizards are not mirrors.
(a) Only conclusion (I) follows
(b) Neither conclusion (I) nor (II) follows
(c) Only conclusion (II) follows
(d) Both conclusions (I) and (II) follow [c]

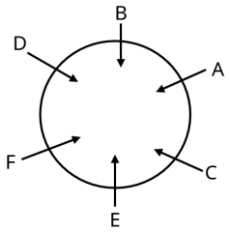
व्याख्या :



It is clear from the diagram that only conclusion – II follows.

16. A, B, C, D, E and F are sitting around a circular table facing the centre. A sits second to the right of E. F is the immediate neighbour of D and E. C sits second to the left of B.
What is the position of F with respect to C?
(a) Immediate right
(b) Third to the left
(c) Second to the left
(d) Third to the right **[c]**

व्याख्या :



Hence, it is clear from the diagram that F sits second to the left of C.

17. If the radius of a sphere is increased by 50%, find the percentage increase in the surface area.
(a) 95%
(b) 125%
(c) 100%
(d) 115% **[b]**

व्याख्या :

The radius of the sphere is increased by 50%.
Surface area of a sphere = $4\pi r^2$
Let the initial radius of the sphere be x.
Surface area of the initial sphere = $4\pi x^2$
New radius of the sphere after 50% increase = x+(x का 50%)

$= x + \frac{x}{2}$

$= \frac{3x}{2}$

Total surface area of the new sphere = $4\pi\left(\frac{3x}{2}\right)^2 = 9\pi x^2$

Difference in total surface area of the new and the initial sphere
$= 9\pi x^2 - 4\pi x^2 = 5\pi x^2$

percentage increase = $\frac{5\pi x^2}{4\pi x^2} \times 100 = 125\%$

18. Sumit travelled 10 km 120 m by scooter, 1 km 970 m on foot and 15 km 850 m by bus. What is the total distance travelled by Sumit?
(a) 27 km 920 m
(b) 27 km 930 m
(c) 27 km 950 m
(d) 27 km 940 m **[d]**

व्याख्या :

Distance covered by Sumit by scooter = 10 km 120 m
Distance covered by Sumit by walking = 1 km 970 m
Distance covered by Sumit by bus = 15 km 850 m
Total distance = 27 km 940 m

19. Identify one example of a change in puberty that may indicate sexual maturity.
(a) Behaving differently
(b) New hair-growth patterns
(c) Increase in height
(d) Mood swings **[b]**

Explanation –

During puberty, the body undergoes hormonal changes that indicate sexual maturity. These changes include the following:
Pattern of new hair growth: This is one of the most obvious signs of puberty. It includes growth of hair in the armpits, pubic region and on the face (in boys). This is due to increased production of sex hormones, which are directly linked to the development and functioning of reproductive organs.

20. The sum of the ages of a mother, son and daughter is 70 years. If the mother's age is thrice that of her son, and the daughter's age is 5 years more than that of her brother, then what is the age of the mother?
(a) 35 years
(b) 42 years
(c) 39 years
(d) 45 years **[c]**

व्याख्या :

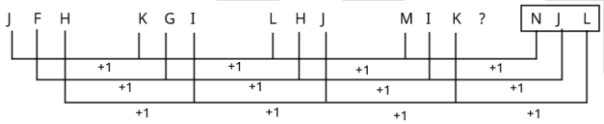
Sum of ages of (mother + son + daughter) = 70 years
Let the age of son be x years.
If the age of mother is times the age of son then the age of mother = 3x
The age of daughter is 5 years more than the age of son. Age of daughter (x+5)
3x+x+(x+5) =70
5x+5=70
5x= 65
X= 13
Mother's age = 3x = 3×13= 39 years

21. Which of the following options should come in place of the question mark (?) in the given series based on the English alphabetical order?

JFH, KGI, LHJ, MIK, ?

(a) NLJ
(b) NJL
(c) JLN
(d) JNL **[b]**

व्याख्या :



? = NJL

22. If ₹2,400 is distributed between A and B in the ratio of 7 : 5, find the share of A.

(a) ₹1,300
(b) ₹1,000
(c) ₹1,400
(d) ₹1,600 **[c]**

व्याख्या :

A+B= Rs.2400
A : B = 7 : 5
Let the value of A and B be 7x and 5x respectively.

Then A's share = $\frac{2400}{(7x+5x)} \times 7x = RS.1400$

Hence, A's share is Rs 1400.

23. Which is the propagation method used in methods like layering or grafting to grow many plants like sugarcane, rose or grapes for agricultural purposes?

(a) Spore formation
(b) Fragmentation
(c) Vegetative propagation
(d) Regeneration **[c]**

Explanation –

Vegetative propagation: It is a method of asexual reproduction in which a new plant is grown from vegetative parts (such as stem, leaves, roots) of the parent plant. Layering and grafting are both examples of vegetative propagation. These methods are used to grow plants that either do not produce seeds or are not viable, or when you want to get a new plant with the same characteristics as the parent plant. Sugarcane, roses and grapes are plants that are commonly grown by vegetative propagation so that the desired characteristics can be maintained.

24. In a certain code language, 'GIRL' is written as '1539' and 'ROSE' is written as '6825'. How will 'R' be written in that code language?

(a) 8
(b) 3
(c) 6
(d) 5 **[d]**

व्याख्या :

Just as
GIRL - 1539
ROSE - 6825
similarly
R = 5

25. What was the main focus of the pavilions displayed at the Indian Art, Architecture and Design Biennale?

(a) Traditional crafts and modern architecture
(b) Contemporary art and innovative design
(c) Interactive technology exhibitions
(d) Indian film and photography **[b]**

व्याख्या –

The Indian Art, Architecture and Design Biennale 2023 was held at the historic Red Fort in Delhi with the main objective of showcasing contemporary art, architecture and innovation. The event showcased the specialties of various Indian cultural heritage, crafts, and design through seven major pavilions. These focused on the importance of various crafts of India, temple architecture, water structures and traditional gardens.

Apart from this, contemporary thinking, innovation, and changes in the field of design were also prominently showcased. Some of the pavilions such as "Sampraho", "Sthapatya" and "Samaatva" brought forth various aspects of architecture and design.

The event aimed to promote innovation in the field of art and design, as well as to connect Indian cultural heritage with a contemporary approach. Programs like panel discussions, workshops, art bazaar and student biennale made the event even more effective. The event was an important platform to exchange contemporary art and innovative design.

26. What is the average of the first twelve multiples of 11?

(a) 71.5
(b) 69.5
(c) 68.5
(d) 70.5 **[a]**

व्याख्या :

average = $\frac{\text{Sum of all observations}}{\text{Number of observations}}$

Sum of first n natural numbers = $\frac{n(n+1)}{2}$

Sum of first 12 multiples of 11 = $11 \times \left[\frac{12(12+1)}{2}\right]$

= 11×6×13 = 858

average = $\frac{858}{12} = 71.5$

27. How many electrons does carbon usually share while forming bonds with other carbon atoms or atoms of other elements?

(a) 6
(b) 4
(c) 2
(d) 1 **[b]**

Explanation –

The atomic number of carbon atom is 6. Its electronic configuration is 2, 4, which means that it has 4 electrons in its valence shell (outermost shell).

To attain stability (i.e., to complete its valence shell, which is 8 electrons according to octet rule), carbon needs 4 more electrons. It shares these 4 electrons with other carbon atoms or atoms of other elements to form covalent bonds. Therefore, carbon usually shares 4 electrons.

28. Which of the following is used to disinfect drinking water?

(a) Bleaching powder
(b) Sodium hydroxide
(c) Baking soda
(d) Washing soda **[a]**

Explanation –

- Bleaching powder (calcium oxychloride, $CaOCl_2$) is a powerful oxidant and disinfectant. It releases chlorine in water which helps disinfect drinking water by destroying microorganisms such as bacteria and viruses.

(b) Sodium hydroxide (NaOH): It is also known as caustic soda. It is a strong alkali and is used in the manufacture of soaps, detergents and other chemical products, but it is not used directly to disinfect drinking water.

(c) Baking soda (sodium bicarbonate, $NaHCO_3$): It is used in baking and as an antacid, but it is not effective for disinfecting water.

(d) Washing soda (sodium carbonate, Na_2CO_3): It is used for washing clothes and softening water, but it does not disinfect water.

29. What type of reaction takes place when calcium oxide reacts vigorously with water to form slaked lime?

(a) Displacement reaction
(b) Combination reaction
(c) Double displacement reaction
(d) Decomposition reaction **[b]**

Explanation –

- Combination Reaction: The reaction in which two or more reactants combine to form a single product is called a combination reaction.

Calcium oxide (CaO), also known as quicklime, when reacts vigorously with water (H_2O) forms quicklime (calcium hydroxide, $Ca(OH)_2$). This reaction can be represented by the following equation:

$CaO(s)+H_2O(l) \rightarrow Ca(OH)_2(aq) + heat$

Here, two reactants namely calcium oxide and water combine to form only one product (calcium hydroxide), so it is an example of a combination reaction. It is also an exothermic reaction as heat is evolved.

30. A's salary is 20% less than B's salary. What percent is B's salary more than A's salary?

(a) 15%
(b) 25%
(c) 20%
(d) 17% **[b]**

व्याख्या :

A's salary is 20% less than B's salary.

Let the salary of B be 100x.

Then A's salary = $100x \times \frac{80}{100} = 80x$

Required Percentage = $\frac{100x - 80x}{80} \times 100 = 25\%$

31. The pattern of magnetic field lines produced by a current carrying conductor _____.

(a) Does not depend on any parameter related to the conductor
(b) Depends on the length of the conductor
(c) Depends on the thickness of the conductor
(d) Depends on the shape of the conductor **[d]**

Explanation –

The pattern of magnetic field lines produced by a current carrying conductor depends significantly on the geometry or shape of the conductor.

For a straight conductor: Magnetic field lines are in the form of concentric circles around the conductor.

For a circular loop: Magnetic field lines are straight inside the loop and in the form of concentric circles outside the loop, whose curvature decreases as the distance from the loop increases.

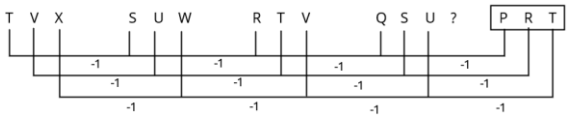
For a solenoid: The magnetic field lines are uniform and parallel inside the solenoid, similar to a bar magnet.

While the strength of the magnetic field depends on the current flowing in the conductor and the

distance from the conductor, the pattern is determined by the shape of the conductor itself.

32. Which of the following options should come in place of the question mark (?) in the given series based on the English alphabetical order?
TVX, SUW, RTV, QSU, ?
(a) PTR
(b) PRT
(c) RPT
(d) RTP **[b]**

व्याख्या :



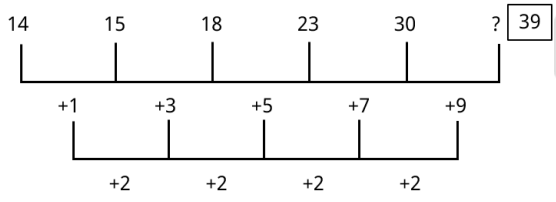
33. Who among the following was appointed as the Minister of Health and Family Welfare in June 2024?
(a) Sarbananda Sonowal
(b) Jagat Prakash Nadda
(c) Shivraj Singh Chouhan
(d) Manohar Lal **[d]**

व्याख्या –

Manohar Lal Khattar was inducted as a Union Minister in Prime Minister Narendra Modi's cabinet in June 2024. He was given the responsibility of the Ministry of Power and the Ministry of Housing and Urban Development. Earlier, he has been the Chief Minister of Haryana and is an MP from Karnal. After he became a Union Minister, he took charge of the Ministry of Power in Delhi on 11 June 2024.

34. दी गई श्रृंखला में प्रश्न चिह्न (?) के स्थान पर निम्नलिखित में से कौन-सा विकल्प आना चाहिए?
Which of the following options should come in place of the question mark (?) in the given series?
14 15 18 23 30 ?
(a) 40
(b) 39
(c) 37
(d) 41 **[b]**

व्याख्या :



? = 39

35. A person's monthly income is ₹ 13,500, and his monthly expenditure is ₹ 9,000. Approximately what percentage of his monthly income does he save every month?
(a) 25%
(b) 21%
(c) 28.57%
(d) 33.33% **[d]**

व्याख्या :

monthly income = 13500
monthly expenses = 9000
Savings = 13500-9000= Rs 4500

$$\text{Monthly Savings \%} = \frac{4500}{13500} \times 100 = 33.33\%$$

36. Which of the following controls bladder pressure?
(a) Kidneys
(b) Nervous system
(c) Heart
(d) Blood pressure [b]

Explanation –

Bladder pressure, which controls the urge to urinate and the process of emptying the bladder, is mainly controlled by the nervous system.

Sensory nerves in the bladder: When the bladder fills with urine, its walls stretch. These stretches send signals to the brain through sensory nerves, making us feel the urge to urinate.

Parasympathetic nervous system: It is the part of the nervous system that is responsible for emptying the bladder. This causes contraction of the muscle (detrusor muscle) in the bladder wall and relaxation of the internal urethral sphincter.

Somatic nervous system: This is the part of the nervous system that controls the external urethral sphincter. It is a voluntary muscle that we can consciously control to stop or start urination.

Brain: Various areas of the brain, such as the micturition centre located in the pons, coordinate the contraction of the bladder and relaxation of the sphincter.

37. Which of the following is the unit of acceleration?
(a) m s^2
(b) ms
(c) m/s
(d) m/s^2 **[d]**

Explanation –

The unit of acceleration is option (d) m/s^2 (meter per square second).

- A force of 1 newton produces an acceleration of 1 ms^{-2} in an object of 1kg mass.

The rate of change in velocity is called acceleration.

$$\text{Acceleration} = \frac{\text{Velocity}}{\text{Time}}$$

- Acceleration is a vector quantity.
- Acceleration is positive in the direction of motion.
- Acceleration is negative in the opposite direction of motion.

The unit of velocity is metre per second (m/s).
The unit of time is second (s).

38. What is the primary objective of Artara'24 Fine Arts Exhibition and Competition?
(a) Selling artworks
(b) Promoting art tourism
(c) To discover and encourage emerging artistic talents
(d) conducting art workshops **[c]**

व्याख्या – Artara'24 Fine Art Exhibition and Competition is a major art event held in Dubai, with the primary aim of identifying and providing a platform to emerging artistic talents from India. It was organized by Jazzrockers, and also included a fine art competition for children called Expressions'24, which gives young artists an opportunity to express their creativity.

39. 5118 is divisible by which of the following?
(a) 6
(b) 5
(c) 8
(d) 7 **[a]**

व्याख्या :
5118 is exactly divisible by option (A).

40. In the following number-pairs, the second number is obtained by performing certain mathematical operations on the first number. What numbers should come in place of X and Y so that the pattern followed by the two numbers on the left of :: is the same as that followed by the two numbers on the right of ::? (Note: Operations should be performed on whole numbers without breaking the numbers into their constituent digits. Ex. 13- Operations on number 13 such as addition/subtraction/multiplying 13 etc. can be performed. Breaking 13 into 1 and 3 and then doing mathematical operations on 1 and 3 is not allowed.)
X : 711 : : 146 : Y
(a) X = 237 Y = 418
(b) X = 252 Y = 393
(c) X = 218 Y = 456
(d) X = 269 Y = 379 **[b]**

व्याख्या :

X	:	711	::	146	:	Y
↓				↓		
252×2+252-45				146×2+146-45		
504+207=711				292+101=393		

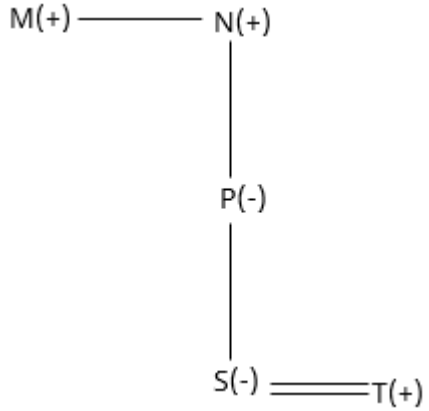
Hence, x = 252 and y = 393.

41. As per the announcement made by the Finance Minister in the Annual Financial Statement 2024-25, how much venture capital fund will be set up for the space economy in India?
(a) ₹700 crore
(b) ₹1,500 crore
(c) ₹500 crore
(d) ₹1,000 crore **[d]**

व्याख्या – Finance Minister Nirmala Sitharaman announced the setting up of a special venture capital fund of ₹1,000 crore in the Union Budget 2024-25 with the aim of growing India's space economy 5-fold over the next 10 years.
Key Points:
Objective: The fund aims to provide financial support to space technology startups in India, thereby promoting innovation, research and development.
Management: The fund will be set up under IN-SPACe (Indian National Space Promotion and Authorization Center), which is responsible for promoting private sector participation.
Investment Range: Investments will range from ₹10-30 crore for early-stage startups and ₹30-60 crore for advanced-stage startups.
Timeline: The fund will be implemented in a phased manner over the next 5 years, with an estimated investment of ₹150-250 crore each year.
Beneficiaries: Around 40 startups are likely to benefit from this initiative.

42. In a certain code language,
'A + B' means 'A is the mother of B',
'A - B' means 'A is the brother of B',
'A × B' means 'A is the wife of B' and
'A ÷ B' means 'A is the father of B'.
If 'M – N ÷ P + S × T', then how is M related to T?
(a) Wife's father's brother
(b) Wife's mother's father's brother
(c) Wife's father's father's brother
(d) Wife's mother's mother's father **[b]**

व्याख्या –



It is clear from the diagram that 'M' is option (b) for 'T'.

43. If 6 men and 8 boys can complete a work in 10 days while 26 men and 48 boys can complete the same work in 2 days, then how much time will 20 men take to do the same work?

(a) 2 days
(b) 4 days
(c) 5 days
(d) 3 days **[c]**

व्याख्या :

(6 men + 8 boys) can do the work in 10 days.
(26 men + 48 boys) can do the same work in 2 days.
(6 m +8B)×10 = (26m +48B)×12
30 M + 40B = 26 m + 48 B
4 m = 8 B

$\frac{M}{B} = \frac{2}{1}$

Total work = (6M+8B)×10 = (6×2+8×1)×10 = 200 units
Total time taken by 20 men to do 200 units of work

$= \frac{200}{20 \times 2} = 5 \text{ days}$

44. A body of mass m is taken to a height h from the ground, what will be the gravitational potential energy of the body? The gravitational acceleration is g.

(a) m× g
(b) mgh
(c) m × h
(d) mg/h **[b]**

Explanation –

When a body of mass m is taken to a height h from the ground, the gravitational potential energy of the body will be mgh.
Gravitational potential energy is the energy that an object has due to its height, when it is in a gravitational field. It is defined as:
PE = m × g × h

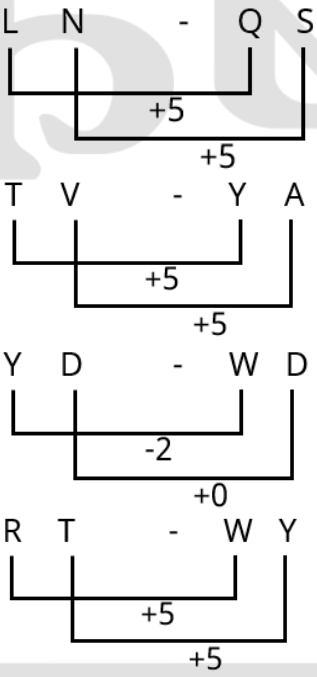
Where:

- PE = Gravitational potential energy
- m = Mass of the body
- g = Acceleration due to gravity
- h = Height from the ground

45. अंग्रेजी वर्णमाला क्रम के आधार पर, निम्नलिखित चार अक्षर-समूह युग्मों में से तीन एक निश्चित प्रकार से समान हैं और इस प्रकार एक समूह बनाते हैं। कौन-सा युग्म उस समूह से संबंधित नहीं है?
(ध्यान दें: असंगत अक्षर-समूह, उस अक्षर-समूह में व्यंजनों/स्वरों की संख्या या उनके स्थान पर आधारित नहीं है।)
Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which pair does not belong to that group?
(Note: The odd letter-cluster is not based on the number of consonants/vowels or their position in that letter-cluster.)

(a) LN-QS
(b) TV-YA
(c) YD-WD
(d) RT-WY **[c]**

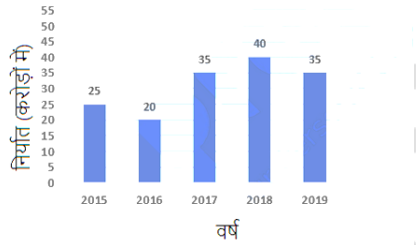
व्याख्या :



Hence, 'YD - WD' is different from the rest.

46. Study the following graph and answer the given question.
The following bar graph shows the annual exports (in crores) of a company during the

period 2015 to 2019.



What is the average export (in crores) of year 2016 and 2018?

(a) 70
(b) 60
(c) 90
(d) 30 **[d]**

व्याख्या :

Total export in 2016 = 20 crores Total export in 2018 = 40 crores

average = $\frac{20+40}{2} = 30$ cr.

47. If 'A' means '÷', 'B' means '×', 'C' means '+', and 'D' means '-', then what will come in place of question mark '?' in the following equation?
55 C 7 D 54 A 9 B 8 = ?

(a) 41
(b) 14
(c) 34
(d) 24 **[b]**

व्याख्या :

55 C 7 D 54 A 9 B 8 = ?
according to question
55+7-54÷9×8 = ?
55+7-6×8 = ?
55+7-48 = ?
62-48 = ?
14 = ?

48. If sec 4A = cosec (3A - 50°), and 4A and 3A are acute angles, then find the value of cosec (A + 25°).

(a) 1
(b) 0
(c) $\sqrt{2}$
(d) $\frac{1}{\sqrt{2}}$ **[c]**

व्याख्या :

sec4A = Cosec(3A-50°)
secθ= cosec(90°-θ)
cosec(90°-4A)=cosec (3A-50°)
Keeping both the angles equal
90°-4A=3A-50°
90°+50°= 3A+4A
140° = 7A

$A = \frac{140°}{7} = 20°$

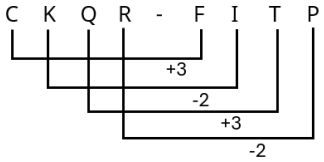
Cosec(A+25°)
Cosec(20°+25°)= Cosec45° = $\sqrt{2}$

49. CKQR is related to FITP in a certain way based on the English alphabetical order. In the same way, WERN is related to ZCUL. Following the same logic, BOLJ is related to which of the following options?

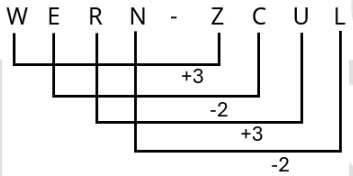
(a) FNNH
(b) DMNJ
(c) DNOK
(d) EMOH **[d]**

व्याख्या :

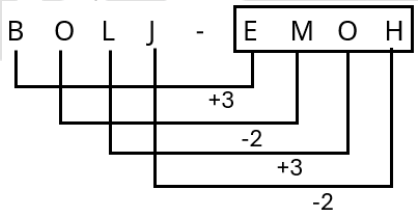
Just as –



and



similarly



50. The marked price of an item is 50% more than its cost price. If the marked price of the item is ₹ 1,500, then what will be the cost price of the item?

(a) ₹1,200
(b) ₹750
(c) ₹800
(d) ₹1,000 **[d]**

व्याख्या :

has given it.
The marked price of the item is Rs 1500.

purchase price = $1500 = \frac{100}{150} = RS.1000$

51. What will happen if the temperature of solids is increased?

(a) The kinetic energy of the particles will increase.
(b) The size of the solid will remain the same.
(c) Temperature has no effect on solids.

(d) The kinetic energy of the particles will decrease. **[a]**

Explanation –

When the temperature of solids is increased, (a) the kinetic energy of the particles increases.

Temperature is a measure of the average kinetic energy of the particles of a substance. When you heat a substance, you impart energy to its particles. This extra energy causes the particles to vibrate and move more rapidly, increasing their kinetic energy.

Solids exhibit thermal expansion when heated, which means that their size (volume) increases.

Temperature has a significant effect on the physical properties of solids (such as shape, density, strength, etc.).

52. The average of 10 observations is 46. Later it is found that one observation was read as 42 instead of 142. Find the correct average.

(a) 56
(b) 65
(c) 54
(d) 45 **[a]**

व्याख्या :

The average of 10 observations is 46.

An observation was read as 42 instead of 142

Total average of 10 observations = 46×10 = 460

New average of 10 observations = $\frac{460+(142-42)}{10}$

=56

53. A 3-digit number is such that the units' digit, the tens' digit and the hundreds digit are in the ratio 1:23. The sum of this number and the number obtained by writing its digits in reverse order is 1332. Find the number.

(a) 963
(b) 246
(c) 123
(d) 414 **[a]**

व्याख्या :

Let the digits of the number be as follows.

Unit's digit = K

Tens' digit = 2K

Hundred's digit = 3K

K + 20K + 300K = 321K

After reversal

Unit's digit = 3K

Tens' digit = 2K

Hundred's digit = K

3K + 20K+ 100K = 123 K

323 K + 123 K = 1332

$K = \frac{1332}{444} = 3$

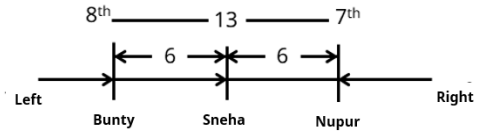
K = 3

Number = 321K = 321×3 = 963

54. In a row of people, all facing north, Bunty is 8th from the left end. Sneha is 15th from the left end. Sneha is exactly between Bunty and Nupur. If Nupur is 7th from the right end of the line, how many people are there in the row?

(a) 28
(b) 26
(c) 20
(d) 22 **[a]**

व्याख्या :



Total number of persons in the queue = 8+13+7 = 28

55. Look at the following series of numbers and symbols and answer the question given below. Numbers and symbols should be counted from left to right only.

(left) 3 Ω 9 # 1 4 6 @ 8 $ 2 & % 7 & * £ 5 (right

How many such numbers are there in the above series, each of which is immediately preceded by a number and immediately followed by a symbol?

(a) Two
(b) Zero
(c) One
(d) More than two **[c]**

व्याख्या –

3 Ω 9 # 1 4 6 @ 8 $ 2 & % 7 & * E 5

Hence, in the above series the number preceded by a number and followed by a symbol is a [4 6 @].

56. What is the value of $(256)^{0.16} \times (256)^{0.09}$?

(a) 256
(b) 24
(c) 64
(d) 16 **[b]**

व्याख्या :

$(256)^{0.16} \times (256)^{0.09}$

$(4)^{4\times0.16} \times (4)^{4\times0.09}$

$(4)^{0.64} \times (4)^{0.36}$

$(4)^{0.64+0.56} = 4^1=4$

57. Which of the following teams was the winner of the 10th season of Pro Kabaddi League?

(a) Pink Panthers
(b) Patna Pirates

(c) Puneri Paltan
(d) Haryana Steelers **[c]**

व्याख्या –

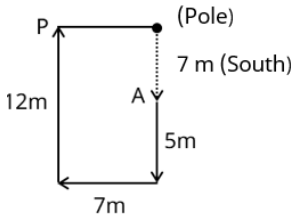
The final of the 10th season of the Pro Kabaddi League (PKL) was played on 1 March 2024 at the GMC Balayogi Sports Complex in Hyderabad, in which Puneri Paltan defeated Haryana Steelers 28-25 to win the PKL title for the first time.

In this match, Pankaj Mohite of Puneri Paltan performed brilliantly with 9 raid points, including a super raid, which turned the tide of the match. Team captain Aslam Inamdar and defender Gaurav Khatri also made important contributions.

58. Anita starts from her house at Point A and walks 5 m towards South. She takes a right turn, walks 7 m, takes another right and walks 12 m and stops at point P. If a pole is placed 7 m towards East from where she stopped (Point P), how far (shortest distance) and in which direction will her house be from the pole? (All turns are 90 degrees turns only unless specified.)

(a) 5 m towards the North
(b) 12 m towards the South
(c) 7 m towards the South
(d) 7 m towards the East **[c]**

व्याख्या –



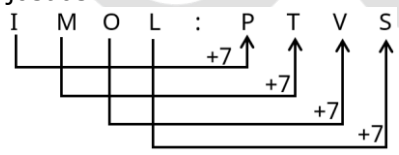
It is clear from the diagram that Anitha's house is 7 m south from the pole.

59. IMOL is related to PTVS in a certain way based on the English alphabetical order. In the same way FJLI is related to MQSP. Following the same logic, KOQN is related to which of the following options?

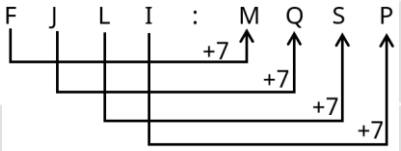
(a) QUWX
(b) QUWT
(c) RUVX
(d) RVXU **[d]**

व्याख्या –

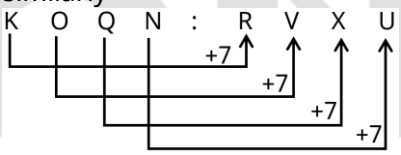
Just as



and



similarly



60. Which of the following statements regarding the atom is correct?

(a) Atoms are, on the whole, electrically neutral.
(b) Atoms are partially electrically neutral.
(c) Atoms have no positive charge.
(d) Atoms are not electrically neutral. **[a]**

Explanation –

Atoms are, on the whole, electrically neutral.

There are three types of sub-atomic particles in an atom:-

Protons – These have a positive (+) charge and are located in the nucleus of the atom.

Neutrons – These have no charge (are neutral) and are also located in the nucleus.

Electrons – These have a negative (-) charge and revolve around the nucleus in different orbits.

The number of protons in a neutral atom is equal to the number of electrons. Since the positive charge of each proton balances the negative charge of an electron, the net charge of the atom is zero, making it electrically neutral.

61. In this question, a statement is given followed by two courses of action numbered I and II. You have to assume all the information given in the statement to be true, and decide which action(s) should logically be followed based on the information given in the statement.

Statement:
A student was caught cheating in the examination despite several warnings from the teacher.

Actions:
I. The student should be expelled from the examination, and his paper should be cancelled.
II. The teacher should let the student go after giving him one more warning.

(a) Only II follows.
(b) Only I follows.
(c) Neither I nor II follows.
(d) Both I and II follow. [b]

व्याख्या –

Action – I follows the statement.

While action – II does not follow the statement.
Hence action – I is correct.

62. In 2024, at which place will the Royal Australian Air Force showcase its fighter aircraft during Exercise Tarang Shakti in India?
(a) Air Force Station, Pune
(b) Air Force Station, Gwalior
(c) Air Force Station, Jodhpur
(d) Air Force Station, Agra **[c]**

व्याख्या –

Tarang Shakti 2024 was a historic multinational air exercise conducted by the Indian Air Force, in which for the first time the Royal Australian Air Force (RAAF) deployed its fighter aircraft in India. The second phase of the exercise was held at Jodhpur Air Force Station from 30 August to 13 September 2024. It was attended by the air forces of India, Australia, the US, Japan, Greece, Singapore, Sri Lanka and the UAE. Australia deployed three EA-18G Growler aircraft and over 120 personnel in the exercise. The aim of the exercise was to enhance strategic cooperation and interoperability among the participating countries. During this, the Suryakiran Aerobatic Team also presented its demonstration flights in the skies of Jodhpur.

63. What is the minimum amount that can be contributed per year under the NPS Vatsalya scheme, and there is no limit on the maximum contribution?
(a) ₹2,500
(b) ₹500
(c) ₹1,000
(d) ₹5,000 **[c]**

व्याख्या –

NPS Vatsalya Scheme is a savings-cum-pension scheme launched by the Government of India for children below 18 years of age. Under this scheme, parents or guardians can open a pension account for their minor children and make regular contributions.

Key Features:

Minimum Annual Contribution: A minimum annual contribution of ₹1,000 is required to open an account in this scheme.

Maximum Contribution Limit: There is no maximum limit on contribution in this scheme, allowing parents to contribute more according to their financial capacity.

Account Operation: This account is opened in the name of the minor but is operated by the parent or guardian.

Maturity: The account automatically converts into a normal NPS account when the minor attains the age of 18 years.

Partial Withdrawal: After a lock-in period of three years, partial withdrawals are allowed up to 25% each time, up to three times, for purposes such as education, medical treatment or disability.

64. Where in the cell does the following reaction take place: Breakdown of the six-carbon molecule glucose into a three-carbon molecule.
(a) In the nucleus
(b) In the mitochondria
(c) In the Golgi bodies
(d) In the cytoplasm **[d]**

Explanation –

In the cell, the breakdown of the six-carbon molecule glucose into a three-carbon molecule (conversion into pyruvate) takes place in (d) In the cytoplasm.

This process, known as glycolysis, is the first step of cellular respiration and can occur either in the presence or absence of oxygen.

Glycolysis, also called glucose breakdown, is a cellular process in which glucose is broken down into pyruvate, releasing energy. This process takes place in the cytoplasm and does not require oxygen.

65. Which gas is passed through calcium hydroxide to form calcium carbonate and water?
(a) Helium gas
(b) Oxygen gas
(c) Hydrogen gas
(d) Carbon dioxide gas **[d]**

Explanation –

(a) Carbon dioxide gas is passed through calcium hydroxide to form calcium carbonate and water.

Chemical Reaction:

This reaction is a classic example of lime water (aqueous solution of calcium hydroxide) reacting with carbon dioxide to form a white precipitate (calcium carbonate) which turns the solution milky.

$Ca(OH)_2(aq)+CO_2(g)\rightarrow CaCO_3(s)+H_2O(l)$

Here:

- $Ca(OH)_2$ = calcium hydroxide (lime water)
- CO_2 = carbon dioxide
- $CaCO_3$ = calcium carbonate (white precipitate)

- H_2O = water

66. Which gland secretes adrenalin?

(a) Pineal gland
(b) Pituitary gland
(c) Adrenal gland
(d) Thyroid gland **[c]**

Explanation –

- The adrenal gland secretes the hormone adrenalin (also called epinephrine). This gland is located above the kidney and produces the hormone responsible for the 'fight or flight' response.
- Pineal Gland: It secretes melatonin, which controls the sleep-wake cycle.
- Pituitary Gland: It is called the 'master gland' as it controls many other glands and secretes many hormones like growth hormone.
- Thyroid Gland: It secretes the hormone thyroxine, which controls metabolism and growth.

67. At 16% annual interest rate, what sum of money will give simple interest of ₹ 480 in 3 years?

(a) ₹1,200
(b) ₹800
(c) ₹1,000
(d) ₹600 **[c]**

व्याख्या –

Given.
Rate = 16%
Time = 3 years
Simple interest = Rs 480

$$\text{principal} = \frac{\text{simple interest} \times 100}{\text{time} \times \text{rate}}$$

$$\text{principal} = \frac{480 \times 100}{16 \times 3} = \text{RS.1000}$$

68. A train travelling at a speed of 45 km/h crosses a pole in 24 sec. What is the length of the train?

(a) 1.5 m
(b) 30 m
(c) 300 m
(d) 125 m **[c]**

व्याख्या –

Speed = 45 km/hr
The train crosses the pole in 24 sec.

$$45 \text{ km/h speed in m/s} = 45\frac{5}{18} = \frac{25}{2}\text{m/s}$$

$$\text{Overall Length} = \frac{25}{2} \times 24 = 300 \text{ meter}$$

69. How many electrons are there in 1C charge?

(a) 6×10^{17} Electron
(b) 6×10^{20} Electron
(c) 6×10^{18} Electron
(d) 6×10^{19} Electron **[c]**

Explanation –

Charge on one electron (e) is approximately 1.602×10^{-19} coulomb (C).
Number of electrons (n)= Total charge (Q) / Charge on one electron (e)
Here, total charge (Q) = 1 C
Charge on one electron (e)= 1.602×10^{-19} C
So,
n = 1C / 1.602×10^{-19} C / Electron
n ≈ 0.624×10^{19} Electron
n ≈6.24×10^{18} Electron
i.e. 6×10^{18} electrons

70. If two parallel lines are cut by a transversal, then which of the following is true?

a) Corresponding angles are equal.
b) Alternate interior angles are supplementary.
c) Consecutive angles on the same side of a transversal are equal.
d) Alternate interior angles are equal.

(a) only a
(b) only b
(c) b and c
(d) a and d **[d]**

व्याख्या –

Options A and D are correct.
Option (A)
Corresponding angles are equal. Because when two parallel lines are cut by a transversal, corresponding angles are equal.
Option (D)
Alternate interior angles are equal. Because when two parallel lines are cut by a transversal, alternate interior angles are equal.

71. _____was awarded the title of India's Fastest Growing Sustainable Brand for 2023-24.

(a) Suzlon Energy
(b) Adani Green Energy
(c) Tata Renewable Energy
(d) Gruner Renewable Energy **[d]**

व्याख्या –

Gruner Renewable Energy has been awarded the title of India's Fastest Growing Sustainable Brand for 2023-24. The prestigious award was presented during the 24th edition of the Asian Business & Social Forum: Greatest Brands & Leaders 2024 held at the JW Marriott Marquis Hotel, Business Bay, Dubai. The honour was presented by Shri Anurag Thakur, Indian Member of Parliament.

Gruner Renewable Energy has recently secured contracts for 11 Compressed Biogas (CBG) plants with an average value of ₹100 crore. Through these plants, the company will produce an average of 88,000 tonnes of CBG annually. Additionally, the company plans to increase its workforce from 1,200 to over 5,000, which will boost job creation through these projects.

72. Who among the following is the author of the book 'I Have the Streets – A Kutty Cricket Story'?

(a) Kuldeep Yadav
(b) Sachin Tendulkar
(c) Ravichandran Ashwin
(d) Sourav Ganguly **[c]**

व्याख्या –

The book "I Have the Streets: A Kutty Cricket Story" is authored by Indian cricketer Ravichandran Ashwin, who is assisted in co-writing by Siddharth Monga. The book presents the beginning of Ashwin's cricket journey, his struggles, and memories from his gully cricket days. In it, Ashwin details his childhood experiences, health problems, and the hardships of a middle-class family that lead him to pursue a career in professional cricket. The book also discusses the culture of gully cricket, the role of his coaches, and his approach to cricket. The book highlights various aspects of Ashwin's life and shares his story of struggles and success.

73. In the following number-pairs, the second number is obtained by performing certain mathematical operations on the first number. What numbers should come in place of X and Y so that the pattern followed by the two numbers on the left of :: is followed by the same pattern on the right of ::?

(Note: Operations should be performed on whole numbers without breaking the numbers into their constituent digits. Ex. 13 - Operations on number 13 like addition/subtraction/multiplying 13 etc. can be performed. Breaking 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

X : 523 : : 9 : Y

(a) x = 9 Y = 294
(b) x = 11 Y = 225
(c) x = 15 Y = 286
(d) x = 13 Y = 250 **[b]**

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X : 523 :: 9 : Y
↓ ↓
11 9
↓ -3 ↓ -3
$(8)^3 + 11 = 523$ $(6)^3 + 9 = 225$

Hence, x = 11 and y = 225.

74. In a certain code language, 'SOLVE' is written as '36598', 'STORE' is written as '39164', and 'WHOLE' is written as '27689'. How will 'V' be written in the same code language?

(a) 8
(b) 9
(c) 5
(d) 3 **[c]**

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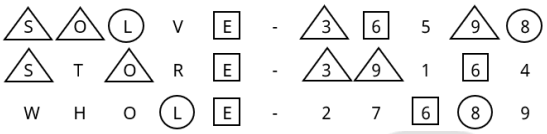

similarly
V = 5

75. Justify the given statement.
'Plants require less energy'.

(a) Because plants use relatively fast transport systems.
(b) Many tissues of the plant body contain a small proportion of dead cells.
(c) Energy requirements differ among different body designs. Plants do not move and many of their tissues contain a large proportion of dead cells.
(d) Because plants are autotrophic organisms and make their own food. **[c]**

Explanation –

Energy requirements differ among different body designs. Plants do not move and many of their tissues contain a large proportion of dead cells.

Plants do not move: Animals need to move constantly to find food, mate, escape from predators, etc., which consumes a lot of energy. Plants are usually sessile (rooted in one place), so they do not need to expend energy for movement.

many of their tissues have a large proportion of dead cells: Plant bodies, especially their wood (xylem) and some other structural tissues, contain a large number of dead cells. Dead cells are metabolically inactive, that is they do not require energy to live or function. Whereas most cells in animal bodies are alive and metabolically active, requiring constant energy.