

Answers

1. Answer: b

Explanation:

The isotope symbol ${}^AX$ shows the mass number A on the top-left. For ${}^{12}\text{C}$, the atomic number of carbon is 6, so it has 6 protons. Mass number is protons plus neutrons, giving $12 \text{ minus } 6 = 6$ neutrons. A neutral atom has electrons equal to protons, so it has 6 electrons too. Hence the correct description is 6 neutrons and 6 protons.

2. Answer: a

Explanation:

The question figure consists of two distinct parts: a rectangular shape with a rounded right cap, and a curved arc/crescent shape.

By combining these two parts without altering their proportions, the curved arc fits directly into the rounded right side of the rectangular part.

This composite arrangement matches figure **A** exactly.

Hence, figure **A** is the correct answer figure.

3. Answer: c

Explanation:

Each term pairs an alternate letter with an even number that gives the letter's position in the alphabet: L is the 12th letter (L12), N is the 14th (N14), P is the 16th, and R is the 18th (R18). So the expected middle term is P16, but the given term is P17, which breaks the letter-position pattern followed by the other three.

4. Answer: b

Explanation:

Fort St. George was constructed by the English East India Company in 1644 at Madraspatnam (present-day Chennai) on land granted by the local Nayak ruler. It became the Company's first fortified settlement on the eastern coast of India and served as the headquarters of the Madras Presidency. Thus, Fort St. George is the first British-built fort in India.

5. Answer: a

Explanation:

From the given pie chart, the percentage share of Non-Performing Assets (NPA) attributed to Bank "A" is 30%.

The total NPA across all banks is given as ₹ 300 lakh crore.

The NPA for Bank "A" is calculated as:

$$\text{NPA of Bank A} = \frac{30}{100} \times 300 = 90 \text{ lakh crore}$$

Hence, the NPA of Bank "A" up to December 2017 is **90** lakh crore.

6. Answer: a

Explanation:

The given question figure shows an inverted trapezoid (wider top, narrower bottom) containing a small smiley face in the upper-left corner and a curved arc along the bottom edge.

When this figure is rotated counter-clockwise by 90 degrees, the relative positioning of the outer trapezoid, the smiley face, and the arc remains structurally congruent to figure C.

Hence, figure C bears the closest resemblance to the question figure.

7. Answer: d

Explanation:

The 2018 World Food Prize was jointly awarded to Dr Lawrence Haddad and Dr David Nabarro for their leadership in raising the profile and funding for maternal and child undernutrition, especially during the first 1000 days of life. Their advocacy shaped the global Scaling Up Nutrition movement. Hence the other laureate alongside Dr Nabarro is Lawrence Haddad.

8. Answer: d

Explanation:

If the product of two numbers is P and one of them is a, the other is P divided by a.

Step 1 – Set up the division: $\frac{1.728}{6.4}$.

Step 2 – Clear the decimals by multiplying numerator and denominator by 10: $\frac{17.28}{64}$.

Step 3 – Divide: $\frac{17.28}{64} = 0.27$. So the second number is 0.27.

9. Answer: c

Explanation:

Plant permanent tissues are classified as simple (made of one cell type) or complex (made of more than one cell type performing a common function). Parenchyma, collenchyma and sclerenchyma each consist of a single cell type, so they are simple tissues. Xylem, however, is composed of tracheids, vessels, xylem parenchyma and xylem fibres working together to conduct water; that mixed make-up defines a complex permanent tissue.

10. Answer: c

Explanation:

From 'Some pants are dark' and 'All dark are coats', the dark items are a shared subset of pants and coats. So those particular pants which are dark must also be coats, giving 'Some pants are coats' — conclusion 1 follows validly.

Conclusion 2 says 'All coats are pants', but the premises never state that every coat has to be a pant; coats may exist that are not pants. Hence only conclusion 1 is correct.

11. Answer: c

Explanation:

Apply BODMAS: brackets first, then division and multiplication, then addition.

Step 1 — First bracket: $169 \div 13 + 13 = 13 + 13 = 26$.

Step 2 — Second bracket: $85 - 23 \times 5 = 85 - 115 = -30$; third bracket: $114 \div 19 = 6$.

Step 3 — Combine: $338 \div 26 + (-30) \times 6 = 13 - 180 = -167$.

Hence, the value is -167.

12. Answer: d

Explanation:

The first International Film Festival and Awards of Australia (IFFAA) was held in Melbourne in March 2017.

Alia Bhatt received the Best Actress award there for her role in Uda Punjab.

Hence, the actress is Alia Bhatt.

13. Answer: d

Explanation:

Let the two costs be x and y with $x + y = 480$.

Step 1 — equate the selling prices: $0.85x = 1.19y$, giving $\frac{x}{y} = \frac{1.19}{0.85} = \frac{7}{5}$.

Step 2 — split ₹480 in the ratio 7 : 5: $x = 480 \times \frac{7}{12} = 280$ and $y = 480 \times \frac{5}{12} = 200$.

Cost prices are ₹280 and ₹200.

14. Answer: a

Explanation:

Step 1 — take the square root: $\sqrt{324} = 18$, since $18 \times 18 = 324$.

Step 2 — the right side $x8$ denotes the two-digit number formed by the digit x followed by 8. So $x8 = 18$, which means the tens digit x is 1.

15. Answer: c

Explanation:

From the identity $\sin^2 A + \cos^2 A = 1$ and the given relation $\sin A + \sin^2 A = 1$, we get $\cos^2 A = 1 - \sin^2 A = \sin A$.

Squaring, $\cos^4 A = \sin^2 A$, so $\cos^2 A + \cos^4 A = \sin A + \sin^2 A = 1$.

Hence, the value is 1.

16. Answer: d

Explanation:

The period number of a main-group element equals the highest principal quantum number of its occupied shell. In the third period, electrons occupy shells with $n = 1, 2$ and 3 , which are named K, L and M respectively ($K = n_1, L = n_2, M = n_3$). No electrons are yet placed in the N shell, since that starts filling from the fourth period. Hence third-period atoms have exactly the K, L and M shells occupied.

17. Answer: c

Explanation:

Bhilar, a village near Mahabaleshwar in Satara district, was developed as India's first "Village of Books" (Pustakanche Gaon).

It was inaugurated by the Maharashtra government in May 2017, with books kept in homes and public spots for anyone to read.

Hence, the state is Maharashtra.

18. Answer: c

Explanation:

According to the problem statement, the monthly fee charged for the gym facility is ₹ 500 per consumer.

From the given table, the number of consumers using the gym is 300.

The total monthly earnings generated from the gym consumers are calculated as:

$$\text{Total Earnings} = 300 \times 500 = ₹1,50,000$$

Hence, the complex house earns ₹ 1,50,000 per month from gym consumers.

19. Answer: b

Explanation:

In each given box, an uppercase English letter is placed above a horizontal divider line and its horizontal axis reflection (water image) is shown below it:

- In A: Letter L is reflected as an inverted L.
- In B: Letter M is reflected as an inverted M (W).
- In C: Letter U is reflected as an inverted U (∩).
- In D: Letter V is shown above, but the shape below is also an upright V rather than its inverted reflection (which should be Λ).

Hence, figure D is the odd one out because it fails to follow the reflection rule.

20. Answer: b

Explanation:

By definition $\text{pH} = -\log[\text{H}^+]$, so a lower pH corresponds to a higher hydrogen ion concentration. The three pH values are 2, 11 and 7, hence $[\text{H}^+]$ values are 10^{-2} , 10^{-11} and 10^{-7} mol/L for X, Y and Z. In descending order of $[\text{H}^+]$ we get X (10^{-2}) > Z (10^{-7}) > Y (10^{-11}), giving the order X, Z, Y.

21. Answer: a

Explanation:

Let the son's present age be s years, so the father's age is $4s$.

Step 1 – after 20 years the ages become $s + 20$ and $4s + 20$. The condition gives $4s + 20 = 2(s + 20)$.

Step 2 – solve: $4s + 20 = 2s + 40$, so $2s = 20$ and $s = 10$.

Step 3 – father's age = $4 \times 10 = 40$. Present ages are 40 years and 10 years.

22. Answer: d

Explanation:

Median is the middle value of the data after sorting it in ascending order. For an even count n the median is the mean of the $n/2$ and $(n/2 + 1)$ terms.

Step 1 – sort: 2, 5, 7, 7, 8, 8, 10, 10, 14, 15, 17, 18, 24, 27, 28, 48. Total terms $n = 16$.

Step 2 – pick the 8th and 9th terms: 10 and 14.

Step 3 – median = $\frac{10 + 14}{2} = 12$.

23. Answer: b

Explanation:

The Rowlatt Act, officially the Anarchical and Revolutionary Crimes Act, was passed by the Imperial Legislative Council in March 1919 on the recommendation of the Rowlatt Committee. It empowered the government to arrest and detain suspects without trial and to try political cases without juries. Widespread protests against it led to the Rowlatt Satyagraha and the Jallianwala Bagh massacre later the same year. Hence 1919 is the correct year.

24. Answer: c**Explanation:**

Valency measures an atom's combining capacity, which arises from its tendency to gain, lose or share electrons to attain a stable octet in its outermost shell. Atoms that already have a completely filled outermost shell — the noble gases — have no such tendency and therefore do not usually form bonds with other elements. Their combining capacity is nil, so their valency is zero.

25. Answer: c**Explanation:**

The Golden Glove is awarded at every FIFA World Cup to the tournament's best goalkeeper. At the 2018 edition held in Russia, Belgium's Thibaut Courtois received the honour after a series of decisive saves that carried his team to a third-place finish, including a shutout of Brazil in the quarterfinals. Hence the recipient was Thibaut Courtois.

26. Answer: d

Explanation:

Vice President M. Venkaiah Naidu officially launched the National Sports Talent Search Portal on 28 August 2017 in New Delhi.

The portal identifies sporting talent aged 8 to 12 years across the country and grooms them into future champions through scholarships and structured training under the Ministry of Youth Affairs and Sports.

27. Answer: a**Explanation:**

England defeated Spain 5-2 in the FIFA U-17 World Cup 2017 final held at Salt Lake Stadium, Kolkata on 28 October 2017.

It was England's first FIFA World Cup title at any level. India hosted the tournament, its first ever FIFA global event, across six venues.

28. Answer: d**Explanation:**

The correct answer is: Both I and II are implicit.

Vimla reminds her husband about the raincoat, which is a waterproof garment worn to protect against rain. This directly implies she believes it might rain (Assumption I) – otherwise there would be no need for a raincoat.

The reminder itself reflects concern for her husband's wellbeing: getting drenched can lead to illness. Her prompt care shows she is mindful of his health (Assumption II).

Since both underlying beliefs are essential for the statement to make sense, both assumptions are implicit.

29. Answer: a

Explanation:

Across a period, the nuclear charge rises by one unit for each successive element while electrons are added to the same outermost shell.

The stronger effective nuclear pull draws the shell inward, so atomic radius decreases from Sodium (186 pm) through Magnesium, Aluminium, Silicon, Phosphorus, Sulphur down to Chlorine (99 pm).

30. Answer: c

Explanation:

Aditi has only one brother mentioned in the statement, and that brother is Pavithran.

Rishab is described as the son of Aditi's brother, so Rishab is the son of Pavithran. Therefore Pavithran stands as the father of Rishab.

31. Answer: d

Explanation:

Gandhi Sagar Dam is a masonry gravity dam built across the Chambal river in the Mandasaur district of Madhya Pradesh.

Commissioned in 1960, it is the first of the four major dams under the joint Chambal Valley project of Madhya Pradesh and Rajasthan, with an installed hydroelectric

capacity of 115 MW.

32. Answer: c

Explanation:

Kala-azar or visceral leishmaniasis is caused by the protozoan parasite *Leishmania donovani*, transmitted by the bite of the female sandfly.

Leishmania belongs to the flagellated Kinetoplastida and multiplies by longitudinal binary fission, in which the cell divides along its long axis, splitting the flagellum first.

33. Answer: d

Explanation:

Gravitational potential energy is the energy stored in a body by virtue of its position above a reference level.

It equals the work done in raising a mass m against gravity g to a height h , giving $PE = mgh$. Here g is taken positive because we are computing energy stored, not the downward force.

34. Answer: c

Explanation:

In August 2018 the Supreme Court approved colour-coded holographic stickers for vehicles in Delhi, based on the fuel used.

Light blue stickers mark petrol and CNG vehicles, and orange stickers mark diesel vehicles, so polluting vehicles can be identified quickly.

Hence, the city is Delhi.

35. Answer: b

Explanation:

Force is a vector quantity. When two forces act along the same line and in the same direction their magnitudes add directly.

Net force $F = 10\text{ N} + 5\text{ N} = 15\text{ N}$, directed along the common line of action of the two forces.

36. Answer: b

Explanation:

By Newton's second law of motion, force = mass $\times$ acceleration, i.e. $F = ma$.

Here $m = 60\text{ kg}$ and $a = 4\text{ m/s}^2$, so $F = 60 \times 4 = 240\text{ N}$.

Note: RRB did not award marks for this question in the official key.

Hence, the force required is 240 N.

37. Answer: d

Explanation:

Within a group in the periodic table, ionisation energy falls as atomic size grows because the outermost electron becomes progressively easier to remove.

All four options are noble gases from Group 18. Helium, the smallest and topmost member, holds its two 1s electrons most tightly, giving it the highest first ionisation

energy at 2372 kJ per mole.

38. Answer: c

Explanation:

To determine the total number of triangles in the given figure, count by size and composition:

- Individual small triangles inside the upper inverted-triangle configuration: 3 upright small triangles and 1 inverted center triangle = 4 small triangles.
- The intermediate triangle formed by uniting these 4 small triangles: 1 triangle.
- The entire large outer triangle: 1 triangle.

Adding these together gives $4 + 1 + 1 = 6$ triangles in total.

Hence, the number of triangles in the figure is 6.

39. Answer: d

Explanation:

Pratyush was inaugurated on 8 January 2018 at the Indian Institute of Tropical Meteorology, Pune under the Ministry of Earth Sciences.

With a peak performance of 6.8 petaflops, it became the fastest supercomputer in India and the fourth fastest weather and climate research supercomputer in the world at the time of launch.

40. Answer: b

Explanation:

In aerobic respiration a 6-carbon glucose molecule is oxidised fully to carbon dioxide and water.

When muscles run short of oxygen during vigorous work, glucose is broken down anaerobically to two 3-carbon lactic acid molecules. So the 6-carbon glucose is converted to 3-carbon lactic acid, and lactic acid build-up causes cramps.

41. Answer: c

Explanation:

The largest five-digit number is 99999. Divide it by 324 to find the remainder.

$99999 \div 324 = 308$ with remainder 207. Subtract the remainder: $99999 - 207 = 99792$.
Hence the required largest five-digit multiple of 324 is 99792.

42. Answer: a

Explanation:

Sharda starts facing North-East. A 45 degree clockwise turn brings her to face East.

She then turns 135 degrees anticlockwise. From East, moving anticlockwise by 45 degrees reaches North-East, another 45 degrees reaches North, and a final 45 degrees reaches North-West. Hence she faces North-West.

43. Answer: b

Explanation:

Calcium hydroxide solution, commonly called lime water, reacts with carbon dioxide gas passed through it.

The reaction $\text{Ca}(\text{OH})_2 + \text{CO}_2 \rightarrow \text{CaCO}_3 + \text{H}_2\text{O}$ forms insoluble calcium carbonate, which appears as a milky white precipitate. This is the standard test used to identify carbon dioxide gas.

44. Answer: c

Explanation:

The Andhra Pradesh government, under Chief Minister N. Chandrababu Naidu, rolled out the Zero Budget Natural Farming programme in 2018.

The scheme, guided by Padma Shri farmer Subhash Palekar, aims to shift 6 million farmers to chemical-free natural farming by 2024, using cow-based inputs like jeevamrutha and beejamrutha.

45. Answer: d

Explanation:

Statement 1 only says the box has yellow, red and blue pyramids; it gives no numbers, so it cannot give the total.

Statement 2 gives 6 yellow and 7 red pyramids but only "some" blue pyramids, so the total is still unknown.

Taken together, the number of blue pyramids is still not known, so the total cannot be found.

Hence, neither 1 nor 2 is sufficient.

46. Answer: d

Explanation:

Multiply the significant digits and count the total number of decimal places.

$11 \times 1 \times 1 = 11$. Decimal places: $1 + 1 + 2 = 4$. Placing 4 decimal places in 11 gives 0.0011. Hence $1.1 \times 0.1 \times 0.01 = 0.0011$.

47. Answer: c**Explanation:**

Statement 2 says Lali was born in 1976. Present age = current year - 1976 (for example, 42 years in 2018), so statement 2 alone answers the question.

Statement 1 gives only the mean age of Lali and Milka (28), i.e. their total age is 56; without Milka's age, Lali's age cannot be found from it.

Hence, only statement 2 is sufficient.

48. Answer: d**Explanation:**

Simple interest is given by $SI = \frac{P \times R \times T}{100}$.

Substituting the values, $SI = \frac{2735 \times 5 \times 4}{100} = \frac{54700}{100} = 547$. Hence the interest earned in 4 years is Rs 547.

49. Answer: c**Explanation:**

Substitute the operators: 11N8L6P2M10 becomes $11 \times 8 + 6 \div 2 - 10$.

Apply BODMAS: division first gives 3, multiplication gives 88, so the expression is $88 + 3 - 10 = 81$. Hence the coded expression equals 81.

50. Answer: c

Explanation:

NABARD opened its first Climate Change Centre at the Bankers Institute of Rural Development (BIRD), Lucknow in 2018.

The centre is a dedicated knowledge hub that trains bankers and stakeholders in climate-resilient agriculture, financing green projects, and accessing multilateral climate funds like GCF and Adaptation Fund.

51. Answer: a

Explanation:

Pipe x fills $\frac{1}{24}$ of the tank per hour and pipe y fills $\frac{1}{32}$ per hour.

Let pipe x be closed after t hours. Pipe y runs for the full 16 hours.

So $\frac{t}{24} + \frac{16}{32} = 1$, which gives $\frac{t}{24} = \frac{1}{2}$, so $t = 12$.

Pipe x should be closed after 12 hours.

52. Answer: c

Explanation:

The series alternates +5 and -2: $19 + 5 = 24$, $24 - 2 = 22$, $22 + 5 = 27$, $27 - 2 = 25$.

The next operation is +5, so $25 + 5 = 30$.

The next term is 30.

53. Answer: d

Explanation:

From the two universal premises: All rings are round and all round are objects. By transitivity, all rings are objects, so conclusion 1 follows.

Conclusion 2 reverses the direction (all objects are rings) which is not warranted by the premises.

Only conclusion 1 follows.

54. Answer: c

Explanation:

For a convex mirror, $f = R/2 = +2.5$ cm and the object distance $u = -10$ cm.

Mirror formula: $\frac{1}{v} = \frac{1}{f} - \frac{1}{u} = \frac{1}{2.5} + \frac{1}{10} = \frac{1}{2}$, so $v = +2$ cm.

Magnification $m = -\frac{v}{u} = -\frac{2}{-10} = 0.2$.

Hence, the magnification is 0.2.

55. Answer: a

Explanation:

Let the seven consecutive ages be $a, a+1, a+2, a+3, a+4, a+5, a+6$ (youngest to eldest).

Sum of eldest three = $(a+4) + (a+5) + (a+6) = 3a + 15 = 63$, so $a = 16$.

Sum of youngest three = $a + (a+1) + (a+2) = 3a + 3 = 48 + 3 = 51$ years.

56. Answer: d

Explanation:

Let Jelena's present age be x years, so Jayden's present age is $70 - x$ years.

Step 1 — Five years ago Jelena was $x - 5$ and Jayden was $65 - x$. The given condition gives $65 - x = 2(x - 5)$.

Step 2 — Solve: $65 - x = 2x - 10$, so $3x = 75$ and $x = 25$.

Step 3 — Jayden's present age = $70 - 25 = 45$. Check: five years ago Jayden was 40 and Jelena was 20, and 40 is indeed twice 20.

Hence, 45 years.

57. Answer: c

Explanation:

From "All pigs are dirty" and "All dirty are muddy", every pig is dirty and every dirty thing is muddy, so all pigs are muddy. Since pigs exist, some muddy things are pigs, so conclusion 1 follows.

All dirty things are muddy, so some muddy things are dirty, and conclusion 2 also follows.

Note: The official RRB key marked "Only conclusion 2 follows". By the rules of syllogism (a universal premise converts to a particular conclusion), both conclusions follow.

Hence, both conclusions follow.

58. Answer: d

Explanation:

The correct answer is: Cl (Chlorine).

Electronegativity is the tendency of an atom to attract shared electrons in a covalent bond. Across a period, electronegativity increases from left to right as the nuclear charge grows and atomic radius contracts.

Among the four options — S, P, Al, and Cl — all belong to the third period. Their positions from left to right are: Al (Group 13) < P (Group 15) < S (Group 16) < Cl (Group 17). Chlorine, sitting furthest right just before the noble gases, has the highest effective nuclear pull on shared electrons.

On the Pauling scale, chlorine's electronegativity is 3.16, higher than S (2.58), P (2.19), and Al (1.61).

59. Answer: b

Explanation:

The numbers double: 2, 4, 8, so next is 16.

The letters skip 5 positions each time: A (+6) G (+6) M (+6) S.

Combining, the next term is 16S.

60. Answer: d

Explanation:

The Baahubali film series (2015 and 2017) was directed by S. S. Rajamouli.

The antagonist Bhallaladeva, cousin of the hero Amarendra Baahubali, was played by the Telugu actor Rana Daggubati.

The correct answer is Rana Daggubati.

61. Answer: d

Explanation:

Upstream speed = $75/12 = 6.25$ km/h. Downstream speed = $75/7.5 = 10$ km/h.

Speed of current = $(\text{downstream} - \text{upstream})/2 = (10 - 6.25)/2 = 3.75/2 = 1.875$ km/h.

The current flows at 1.875 km/h.

62. Answer: a

Explanation:

Cheriyal scroll painting is a stylised version of Nakashi art with roots in the town of Cheriyal in the present-day state of Telangana.

The narrative scrolls received a Geographical Indication tag in 2007 recognising Telangana as their state of origin.

The correct answer is Telangana.

63. Answer: d

Explanation:

An assumption is a fact that must be taken for granted for the statement to make sense.

Assumption I about late-night toxins is an additional claim, not necessary for the doctors' recommendation to hold.

Assumption II directly supports why rice would be suggested at dinner – if rice digests quickly it will not stay undigested overnight. So only II is implicit.

64. Answer: a

Explanation:

The Padma Shri awards announced in 2017 honoured several sportspersons, including wrestler Sakshi Malik, who won bronze at the Rio 2016 Olympics.

Sakshi Malik was the first Indian woman wrestler to win an Olympic medal; Babita Kumari, Geeta Phogat and Deepika Kumari were not in the 2017 Padma Shri list.

Hence, the sportsperson is Sakshi Malik.

65. Answer: a

Explanation:

Assumption I directly underlies the statement – environmental elements matter for health only if clean air, water and protection are essential to health, which is what I states.

Assumption II gives a specific example of a pollution problem, which is additional information rather than a hidden requirement for the statement to hold.

Only assumption I is implicit.

66. Answer: d

Explanation:

One unit of household electrical energy is one kilowatt-hour, which equals 3.6×10^6 J.

Energy used = $150 \times 3.6 \times 10^6 = 540 \times 10^6$ J.

This equals 5.4×10^8 J.

67. Answer: c

Explanation:

Let $y = 2^x$. Then $2^{2x+3} = 8y^2$.

The equation becomes $8y^2 - 17 = 9y - 18$, i.e. $8y^2 - 9y + 1 = 0$.

Factoring: $(8y - 1)(y - 1) = 0$, so $y = 1$ or $y = 1/8$, giving $x = 0$ or $x = -3$.

68. Answer: d

Explanation:

A strong argument must be directly relevant to the question and grounded in sound reasoning.

Argument I addresses the health question directly by pointing out the role of physical activity in holistic development, so it is strong.

Argument II shifts the topic to money and is superficial, so it is weak. Only argument I is strong.

69. Answer: d

Explanation:

NITI Aayog (National Institution for Transforming India) was set up in January 2015, replacing the Planning Commission.

The Prime Minister of India serves as its ex-officio Chairperson while a separate Vice-Chairperson and CEO handle day-to-day work.

The correct answer is the Prime Minister of India.

70. Answer: c

Explanation:

Acceleration is defined as change in velocity per unit time, i.e. metres per second squared.

Velocity has dimension LT^{-1} , so acceleration is LT^{-2} , independent of mass.

Written with all three base symbols this is $L^1M^0T^{-2}$.

71. Answer: a

Explanation:

When two solid surfaces are in contact, microscopic bumps on each surface interlock and resist relative motion.

This resistive contact force is called friction and it opposes the relative sliding of the two surfaces.

The correct answer is friction.

72. Answer: b

Explanation:

2 men finish the work in 30 days, so 1 man takes 60 days and does $\frac{1}{60}$ of the work per day. 3 women finish it in 30 days, so 1 woman takes 90 days and does $\frac{1}{90}$ per day.

One day's work of 6 men and 1 woman = $\frac{6}{60} + \frac{1}{90} = \frac{9}{90} + \frac{1}{90} = \frac{1}{9}$.

So they complete the work in 9 days.

Hence, the answer is 9 days.

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73. Answer: d

Explanation:

A gene is the functional unit of heredity – a specific segment of DNA that carries the code for producing a particular protein or RNA product.

Chromosomes are larger structures containing many genes, while the nucleus and nucleolus are subcellular structures, not DNA sequences.

The correct answer is gene.

74. Answer: a

Explanation:

Each letter in PEARL is shifted forward by one position: P to Q, E to F, A to B, R to S, L to M, giving QFBSM.

Applying the same +1 shift to SUIT: S to T, U to V, I to J, T to U.

SUIT is written as TVJU.

75. Answer: c

Explanation:

Work done in climbing = power $\times$ time = $160 \times 20 = 3200$ J.

This work equals weight $\times$ height: $40 \times h = 3200$, so $h = 80$ m.

Note: The official RRB key marked 8 metres. That value matches the NCERT example this question is based on, where the girl weighs 400 N ($3200/400 = 8$ m); with the printed weight of 40 N the height is 80 metres.

Hence, she can reach a height of 80 metres.

76. Answer: a

Explanation:

Percentage composition is applied to the total mass of the alloy, which is 1 kg = 1000 g.

Copper share = 32% of 1000 g = $\frac{32}{100} \times 1000 = 320$ g.

Zinc (40%) and nickel (28%) make up the rest, but only the copper amount is asked. The copper mass in the alloy is 320 g.

77. Answer: d

Explanation:

Each box displays an English letter in the numerator and a number in the denominator representing its position in the standard alphabetical order:

- In A: T is the 20th letter ($T = 20$).
- In B: X is the 24th letter, but the number provided is 23 ($X \neq 23$).
- In C: O is the 15th letter ($O = 15$).
- In D: L is the 12th letter ($L = 12$).

Hence, figure **B** is the odd one out because the alphabetical position of X is 24, not 23.

78. Answer: c

Explanation:

In the given problem figure series, four symbols occupy the quadrants of a square with a central rotating frame:

- The shaded black triangle moves from the top-left to top-right, then bottom-right across steps 1 to 3 (rotating clockwise 90 degrees each step). In the 4th step, it must move to the bottom-left corner and point towards the left.
- The $\Omega\Omega$ symbol rotates and alternates inverted/upright states.
- The $\pm$ and $*\pm*$ symbols advance through corresponding quadrant shifts.

This clockwise rotational progression uniquely matches answer figure **D**.

Hence, answer figure **D** is the correct figure to replace the question mark (?).

79. Answer: c

Explanation:

When a sum is divided in a ratio, each share equals the sum multiplied by that part over the sum of all parts.

Total parts = $4 + 5 + 6 = 15$. One part = $\frac{1000}{15} = 66.67$.

Tara's share = 4 parts = 266.67. Tina's share = 6 parts = 400.

Difference = $400 - 266.67 = ₹ 133.33$.

80. Answer: b

Explanation:

The Błędów Desert is a sandy expanse of about 32 square kilometres lying in southern Poland, between the Silesian Uplands and the Kraków-Częstochowa Upland.

Often called the Polish Sahara, it is one of the largest accumulations of loose sand in Central Europe and formed on a thick layer of sand left by a retreating glacier during the Quaternary.

The country the desert lies in is Poland.

81. Answer: b

Explanation:

Dmitri Mendeleev used the prefix "eka" to label elements he predicted would fill gaps in his periodic table, each sitting one row below a known analogue. Eka-aluminium

occupied the slot directly below aluminium in Group 13. The element discovered by Paul-Émile Lecoq de Boisbaudran in 1875, matching Mendeleev's predicted mass and density for that slot, is Gallium. (Eka-boron corresponds to Scandium, and Eka-silicon corresponds to Germanium.)

Hence, **Gallium**.

82. Answer: a

Explanation:

A saturated hydrocarbon has only carbon-carbon single bonds and follows the alkane general formula C_nH_{2n+2} .

For $n = 2$, the formula gives C_2H_6 (ethane) — this fits perfectly. C_2H_4 is an alkene (double bond) and C_2H_2 is an alkyne (triple bond); both are unsaturated.

Hence the saturated hydrocarbon here is ethane.

83. Answer: b

Explanation:

Justice Dipak Misra was sworn in as the 45th Chief Justice of India on 28 August 2017, succeeding Justice J. S. Khehar (44th CJI).

He served until October 2018 and was succeeded by Justice Ranjan Gogoi, who became the 46th CJI. Justice Chelameswar was a senior Supreme Court judge but did not become CJI.

The 45th Chief Justice of India was Dipak Misra.

84. Answer: d

Explanation:

Since Shashi and Manoj are siblings, they share the same father and same paternal grandfather.

Shashi's father = Manoj's father. Therefore Shashi's father's father = Manoj's father's father, which is Manoj's paternal grandfather.

The correct relation is grandfather.

85. Answer: d

Explanation:

Average power equals work done divided by time taken, and the work done in lifting a mass through a vertical height against gravity is $W = mgh$.

Step 1 – Compute the work: $W = 80 \times 10 \times 40 = 32000 \text{ J}$.

Step 2 – Divide by the time taken: $P = \frac{W}{t} = \frac{32000}{50} = 640 \text{ W} = 640 \text{ J/s}$.

Hence, 640 J/s.

86. Answer: c

Explanation:

To count the total number of rectangles in the grid, count all 1-cell and composite rectangles formed by combining adjacent cells:

- Single-cell basic rectangles: 7

- 2-cell combined rectangles: 4
- 3-cell combined rectangles: 2
- Composite larger rectangles (including the whole outer boundary): 2

Total number of rectangles = $7 + 4 + 2 + 2 = 15$.

Hence, there are **15** rectangles in the given figure.

87. Answer: d

Explanation:

The relationship between Sitar, Harp, and Musical Instruments is evaluated as follows:

- Sitar is a stringed musical instrument, so the set representing Sitar (A) is completely contained within Musical Instruments (C).
- Harp is also a stringed musical instrument, so the set representing Harp (B) is completely contained within Musical Instruments (C).
- Sitar and Harp are two completely distinct and different musical instruments, meaning their sets are mutually exclusive (disjoint) with no overlap between them.

Therefore, the correct Venn diagram consists of two separate, non-overlapping circles (A and B) enclosed entirely inside a larger circle (C).

This arrangement is represented by diagram **D**.

Hence, diagram **D** correctly depicts the relationship.

88. Answer: a

Explanation:

Average speed = total distance $\div$ total time.

Time for 182 km at 56 km/hr = $\frac{182}{56} = 3.25$ hr; time for 108 km at 72 km/hr = $\frac{108}{72} = 1.5$ hr; the remaining 100 km takes 1.25 hr.

Total time = $3.25 + 1.5 + 1.25 = 6$ hr, so average speed = $\frac{390}{6} = 65$ km/hr.

Hence, the average speed is 65 km/hr.

89. Answer: d

Explanation:

The outermost layer of a plant leaf and young stem, the epidermis, secretes a waterproof coating called the cuticle.

The cuticle is composed mainly of cutin, a waxy, hydrophobic polymer of long-chain fatty acids. In desert plants this layer is especially thick to cut down water loss by transpiration.

Lignin strengthens wood, cellulose forms the cell wall, and pectin cements adjacent cells, so the wax on the outer skin is cutin.

90. Answer: a

Explanation:

Use the cube identity $(x + y)^3 = x^3 + y^3 + 3xy(x + y)$ with $x = a$ and $y = \frac{1}{a}$, so that $xy = 1$. Rearranging, $a^3 + \frac{1}{a^3} = \left(a + \frac{1}{a}\right)^3 - 3\left(a + \frac{1}{a}\right)$.

Substituting the given value $a + \frac{1}{a} = 8$: $a^3 + \frac{1}{a^3} = 8^3 - 3(8) = 512 - 24 = 488$.

Hence, **488**.

91. Answer: b

Explanation:

$$\text{Mean} = \frac{5 + 8 + 22 + 6 + 9 + 15 + 12 + 18}{8} = \frac{95}{8} = 11.875.$$

Sorted data: 5, 6, 8, 9, 12, 15, 18, 22. With eight values the median is the average of the 4th and 5th terms: $\frac{9 + 12}{2} = 10.5$.

$$\text{Mean} - \text{Median} = 11.875 - 10.5 = 1.375.$$

Note: RRB did not award marks for this question in the official key.

Hence, the value is 1.375.

92. Answer: a

Explanation:

$$\text{Evaluate each part: } 18 \times 16 = 288 \text{ and } \frac{3445}{13} = 265.$$

$$\text{Subtract: } 288 - 265 = 23.$$

Hence, the answer is 23.

93. Answer: b

Explanation:

Flight Lieutenant Avani Chaturvedi of the Indian Air Force became the first Indian woman to fly a fighter aircraft solo on 19 February 2018, when she flew a MiG-21 Bison from Jamnagar air base.

She was commissioned in June 2016 along with Bhawana Kanth and Mohana Singh in the first batch of Indian women fighter pilots. The other names listed are distractors.

The first Indian woman fighter pilot to fly solo is Avani Chaturvedi.

94. Answer: b

Explanation:

In a right-angled triangle the hypotenuse is the diameter of the circumscribed circle. Hypotenuse = $\sqrt{1.5^2 + 2^2} = \sqrt{6.25} = 2.5$ cm.

Circumradius $R = 1.25$ cm, so the area = $\pi R^2 = \pi \times 1.5625 = 1.5625\pi$ cm².

Hence, the area is 1.5625π cm².

95. Answer: a

Explanation:

In the given problem figure series of diamond shapes:

- A small star is located on the boundary of the diamond and moves progressively from corner to corner in a clockwise direction.
- Frame 1: Star is positioned at the leftmost corner.
- Frame 2: Star advances clockwise to the top corner.
- Frame 3: Star advances clockwise to the right corner.
- Frame 4: Following the clockwise rotation pattern, the star must advance to the bottom corner.

This layout corresponds precisely to answer figure A.

Hence, answer figure A correctly completes the series.

96. Answer: a

Explanation:

When a vertical plane mirror is positioned on line MN to the right of the object:

- The figure undergoes lateral inversion (a horizontal flip from left to right).
- The element closest to the mirror reflects to remain closest to the mirror, and the element farthest stays farthest.
- The small square positioned at the upper-left flips to the upper-right.
- The vertical segment leading down to the small circle at the lower-right flips to the lower-left.

This lateral reflection matches answer figure C perfectly.

Hence, figure C is the correct mirror image.

97. Answer: d

Explanation:

A square root is rational only when the number under it is a perfect square. π is a well-known irrational constant.

Check: $78^2 = 6084$, so $\sqrt{6084} = 78$, a rational integer. 7652 and 5428 are not perfect squares, so their roots are irrational.

The number that is not irrational is $\sqrt{6084}$.

98. Answer: d

Explanation:

Let pipe A alone take t hours. Then B takes $4t$ hours (A is one-fourth of B) and C takes $3t$ hours.

Combined rate: $\frac{1}{t} + \frac{1}{4t} + \frac{1}{3t} = \frac{12 + 3 + 4}{12t} = \frac{19}{12t} = \frac{1}{24}$, giving $t = 38$ hours.

Without C: $\frac{1}{38} + \frac{1}{152} = \frac{5}{152}$, so time = $\frac{152}{5} = 30.4$ hours.

99. Answer: b

Explanation:

A concave (converging) mirror forms different images depending on where the object is placed relative to its focal point.

When the object lies between the pole and the focus of a concave mirror, the reflected rays diverge and produce an image behind the mirror that is virtual, erect and magnified. Dentists hold the mirror very close to the tooth (within the focal length) precisely for this reason.

The image seen is virtual and enlarged.

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100. Answer: b

Explanation:

The terms are squares of odd numbers and cubes of even numbers in turn:

$$1^2, 2^3, 3^2, 4^3, \dots$$

The missing terms are $5^2 = 25$, $6^3 = 216$, then $7^2 = 49$, $8^3 = 512$ are given, followed by $9^2 = 81$ and $10^3 = 1000$.

Hence, the missing terms are 25, 216, 81, 1000.