

Answers

1. Answer: d

Explanation:

Blood is a fluid connective tissue that circulates through the vascular system; it is red because its red blood cells carry haemoglobin, so calling it a red vascular connective tissue is correct.

An adult human body contains about 5–6 litres of blood, and human RBCs live for about 115–120 days, so these statements are also correct.

Blood makes up about 7–8% of total body weight, not 1.7–1.8%, so that statement is false.

Hence, It is about 1.7–1.8% of the body weight.

2. Answer: a

Explanation:

Both data I and II together are necessary.

Statement I alone fixes Vimla = Kamla = Sudha but gives no numerical value, so Vimla's age cannot be found from it alone.

Statement II alone gives $\text{Vimla} + \text{Kamla} + \text{Amla} = 32$ with $\text{Amla} = \text{Vimla} + \text{Kamla}$, which simplifies to $2(\text{Vimla} + \text{Kamla}) = 32$, i.e. $\text{Vimla} + \text{Kamla} = 16$. The individual value of Vimla is still unknown.

Combining both: from I, $\text{Vimla} = \text{Kamla}$, so $2 \cdot \text{Vimla} = 16$ and $\text{Vimla} = 8$ years. Only the two statements together pin the answer.

Hence, both data I and II together are necessary.

Note: The official RRB answer key marks 'Only data II is sufficient', but statement II alone gives only Vimla + Kamla = 16 and cannot fix Vimla's age, so the answer here is corrected to both statements together.

3. Answer: c

Explanation:

The work done against gravity in lifting a mass vertically is given by $W = mgh$, where m is the mass, g the acceleration due to gravity and h the vertical height through which the load is raised.

Substituting the values, $W = 11 \times 10 \times 1.5 = 165 \text{ J}$. The unit of work is the joule, which rules out the option expressed in newtons. Hence, 165 J.

4. Answer: a

Explanation:

Starting direction is west. A clockwise turn of 90° from west brings him to north, and a further 45° clockwise takes him to north-east, so after the 135° clockwise rotation he faces north-east.

From north-east, an anticlockwise rotation of 45° moves him back by 45° , which places him pointing exactly towards north. Hence, North.

5. Answer: a

Explanation:

Let the length, breadth and height be $2x$, $3x$ and $5x$ cm respectively. The total surface area of a cuboid is $2(lb + bh + lh)$.

So $2(2x \cdot 3x + 3x \cdot 5x + 2x \cdot 5x) = 2(6x^2 + 15x^2 + 10x^2) = 62x^2$. Setting $62x^2 = 6200$ gives $x^2 = 100$, so $x = 10$. The dimensions are $20\text{ cm} \times 30\text{ cm} \times 50\text{ cm}$. Hence, $20\text{cm} \times 30\text{cm} \times 50\text{cm}$.

6. Answer: d

Explanation:

Argument 1 confuses the presence of senior staff with promoting purely on the basis of seniority; a company can run smoothly with experienced seniors even if promotions are given on merit, so this argument is weak and off-point.

Argument 2 directly engages the proposal: making seniority the sole criterion blocks capable juniors, breeds favouritism towards long-tenured employees and leads to discrimination against merit, which is a strong and relevant objection. Hence, Only argument 2 is strong.

7. Answer: a

Explanation:

Magnification is defined as the ratio of the image size to the object size (or image distance to object distance). Because it is a ratio of two like quantities, the units cancel and magnification is a pure number without any unit.

Focal length is a length and is measured in metres, the power of a lens is measured in dioptres (reciprocal of focal length in metres) and the power of accommodation of the eye is also expressed in dioptres. Hence, Magnification.

8. Answer: b

Explanation:

Total amount paid for five shirts is $5 \times 123.79 = 618.95$ rupees. Let the deposit be D . The account balance follows the equation $713.39 + D - 618.95 = 545.19$.

Rearranging, $D = 545.19 + 618.95 - 713.39 = 1164.14 - 713.39 = 450.75$. So Ravi deposited ₹450.75 into the account. Hence, ₹450.75.

9. Answer: b

Explanation:

Open Market Operations are one of the key quantitative tools used by the Reserve Bank of India to regulate liquidity in the economy. In an OMO, the RBI buys or sells securities in the open market to inject or absorb money from the banking system.

The instruments bought and sold during OMOs are government securities such as treasury bills and dated government bonds, not foreign currency, fixed assets or bullion. Hence, Government securities.

10. Answer: a

Explanation:

Sher Shah Suri (1540–1545) carried out an important monetary reform during his short reign and issued a standard silver coin weighing about 178 grains, which came to be called the Rupaya. He also issued copper Dam and gold Mohur as part of a trimetallic coin system.

The Mughals adopted and continued the Rupaya as the main silver coin of their empire, while the Mohur was retained as the gold coin. Taka and Tanka were older

Sultanate denominations and not Sher Shahs silver coin. Hence, Rupaya.

11. Answer: d

Explanation:

Distance travelled is Speed multiplied by Time. At 48 km/hr for 10 hours the total distance is $48 \times 10 = 480$ km.

To cover the same 480 km in 8 hours, the required speed is $480 \div 8 = 60$ km/hr. Hence, 60 km/hr.

12. Answer: c

Explanation:

When calcium carbonate is heated strongly, it undergoes a thermal decomposition reaction. Calcium carbonate breaks down into calcium oxide (quicklime) and carbon dioxide gas; the balanced reaction is $CaCO_3 \rightarrow CaO + CO_2$.

This is the classical industrial process used in the manufacture of lime from limestone. Water is not released from carbonate decomposition, carbon monoxide forms in incomplete combustion of carbon, and ozone is unrelated to this reaction. Hence, CO_2 .

13. Answer: c

Explanation:

In such classification problems, three of the given figures share a common property – for example the number of sides, the type of enclosed region, the symmetry or the

shading pattern – while one figure deviates from this shared property.

On observing the arrangement of lines and curves across the four figures A, B, C and D, figure C does not conform to the common property shared by A, B and D and therefore stands apart. Hence, C.

14. Answer: c

Explanation:

Let the two parts be $7x$ and $11x$. After adding 6 to each, they become $7x + 6$ and $11x + 6$, and their new ratio is $5 : 7$, so $\frac{7x + 6}{11x + 6} = \frac{5}{7}$.

Cross-multiplying gives $7(7x + 6) = 5(11x + 6)$, which simplifies to $49x + 42 = 55x + 30$, so $6x = 12$ and $x = 2$. The two parts are 14 and 22, and the larger is 22. Hence, 22.

15. Answer: a

Explanation:

Weight is the gravitational force exerted on a body and is given by the relation $W = mg$, where m is the mass in kilograms and g is the acceleration due to gravity.

Substituting, $W = 20 \times 10 = 200$ newtons. Weight is a force and so its SI unit is the newton, not kilogram (unit of mass), watt (unit of power) or pascal (unit of pressure). Hence, 200 N.

16. Answer: a

Explanation:

Mother Teresa of Kolkata, the Albanian-Indian Roman Catholic nun who founded the Missionaries of Charity, was canonised as a Saint by Pope Francis on 4 September 2016 at a ceremony in St. Peter's Square, Vatican City.

Sister Alphonsa was canonised in 2008, while the other names were honoured in earlier periods. The canonisation of Mother Teresa was carried out by the Pope (based in the Vatican, not France). Hence, Mother Teresa.

17. Answer: b

Explanation:

A plane mirror reverses a clock face left to right, so the actual time is found by subtracting the mirror time from 11:60 (that is, 12:00).

Actual time = 11:60 - 9:30 = 2:30. The mirrored hour hand halfway between 9 and 10 is actually halfway between 2 and 3, and the minute hand on 6 stays on 6.

Hence, 2 : 30.

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

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18. Answer: d

Explanation:

Dipa Karmakar, born in Agartala, Tripura, became the first Indian woman gymnast to qualify for and participate in the Olympic Games when she represented India at the 2016 Rio Olympics. She narrowly missed a bronze medal, finishing fourth in the women's vault final with her famous Produnova vault.

Aruna Reddy later won India's first individual medal in gymnastics at a World Cup event in 2018, but Dipa Karmakar remains the first woman gymnast to go to the Olympics. Hence, Dipa Karmakar.

19. Answer: d

Explanation:

The International Film Festival of India (IFFI) is one of Asia's oldest and most significant film festivals, organised annually by the Ministry of Information and Broadcasting with the Entertainment Society of Goa. Since 2004, Goa has been the permanent venue for the festival.

The 48th edition of IFFI was held in Panaji, Goa from 20 to 28 November 2017, where films from across the world were screened and awards such as the Golden Peacock were presented. Hence, Goa.

20. Answer: c

Explanation:

Curves a, b, c and d are all the same shallow semicircular arc with an arrowhead at one end: a and b open downwards and c and d open upwards, so each is only a rotated or reflected copy of the same curve.

Curve e is a different shape altogether: a steep, hook-like curve running from top to bottom with its arrow pointing down and to the left. It does not resemble the other four in any way.

Hence, e.

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

21. Answer: a

Explanation:

The second train runs for 5 hours at 70 km/hr, so it covers a distance of $70 \times 5 = 350$ km before it catches the first train. At the point of catching up, both trains have travelled the same distance from the station.

The first train has been running for a total of $2 + 5 = 7$ hours when the second train catches it. So the first train's speed is $350 \div 7 = 50$ km/hr. Hence, 50 km/hr.

22. Answer: a

Explanation:

The relationship between the first pair is that of a country and its official currency - India's official currency is the Indian Rupee. The analogy therefore requires the official currency of the United Kingdom.

The official currency of the United Kingdom is the Pound Sterling. Dinar is used in countries like Kuwait and Iraq, Yen is Japan's currency and Lira was the former currency of Italy and is used in Turkey, so these do not fit. Hence, Pound.

23. Answer: a

Explanation:

Given $4 \cot \theta = 5$, so $\cot \theta = \frac{5}{4}$ and therefore $\tan \theta = \frac{4}{5}$. To simplify the given expression, divide both numerator and denominator by $\cos \theta$.

The expression becomes $\frac{5 \tan \theta + 3}{5 \tan \theta - 3} = \frac{5 \cdot \frac{4}{5} + 3}{5 \cdot \frac{4}{5} - 3} = \frac{4 + 3}{4 - 3} = \frac{7}{1} = 7$. Hence, 7.

24. Answer: c

Explanation:

2.2 is the upper bound of $x - y$.

Numbers correct to one decimal place lie within ± 0.05 of the stated value: $4.45 \leq x < 4.55$ and $2.35 \leq y < 2.45$.

The expression $x - y$ is largest when x is as large as possible and y as small as possible, i.e. $x \rightarrow 4.55$ and $y \rightarrow 2.35$, giving an upper bound of $4.55 - 2.35 = 2.20$.

Among the given options this value is 2.2.

Hence, the upper bound of $x - y$ is 2.2.

Note: RRB dropped this question for all candidates because of a discrepancy in the question/answer; the answer here follows the upper bound worked out above.

25. Answer: b

Explanation:

1872 is the year Mendeleev's periodic table appeared in a German journal.

Dmitri Mendeleev first published his periodic law in 1869 in the Russian Chemical Society journal, and his expanded German-language version — the one that introduced predicted elements such as eka-aluminium and eka-silicon — was carried in Annalen der Chemie during the early 1870s.

Standard competitive-exam references place that German-journal publication in 1872, which is the date the question is asking about.

Hence, Mendeleev's periodic table was published in a German journal in 1872.

26. Answer: b

Explanation:

Sodium carbonate, commonly called washing soda or soda ash, is formed from two sodium atoms, one carbon atom and three oxygen atoms. Each sodium ion carries a +1 charge and the carbonate ion carries a -2 charge, so two sodium ions are needed to balance one carbonate ion.

Combining the ions gives the neutral salt Na_2CO_3 . It is widely used in glass manufacture, soap and detergent production and for softening hard water. Hence, the correct formula of sodium carbonate is Na_2CO_3 .

27. Answer: c

Explanation:

One kilogram equals one thousand grams, so to convert 5 grams into kilograms we divide by 1000. This gives $5\text{ g} = \frac{5}{1000}\text{ kg} = 0.005\text{ kg}$.

Adding this to 6 kilograms: $6\text{ kg} + 0.005\text{ kg} = 6.005\text{ kg}$. The small residual of five grams becomes three decimal places because grams are the thousandth part of a kilogram. Hence, 6 kg 5 g is 6.005 kg.

28. Answer: a

Explanation:

Let the unknown fraction be x . The condition says $\frac{1}{6} - x = \frac{1}{13}$, so $x = \frac{1}{6} - \frac{1}{13}$. The least common denominator of 6 and 13 is 78.

Rewriting with the common denominator: $x = \frac{13}{78} - \frac{6}{78} = \frac{13-6}{78} = \frac{7}{78}$. Hence, the required fraction is $\frac{7}{78}$.

29. Answer: d

Explanation:

Looking at the row for Academy 'B' in the table, the numbers of players selected in the three years are 1 in 2012, 5 in 2013 and 2 in 2014.

Adding these three values gives the total district-level selections from Academy 'B': $1 + 5 + 2 = 8$. Hence, the total number of players selected from Academy 'B' over the three years is 8.

30. Answer: b

Explanation:

Statement I says all boys are singers, which means the set of boys is contained within the set of singers; it does not say singers are a subset of boys. So conclusion 1, that all singers are boys, is only the converse of statement I and does not follow.

Statement II says some singers are trained, but we do not know whether those particular trained singers belong to the boys sub-group or to other singers. Hence conclusion 2 is also not guaranteed. Therefore, neither conclusion 1 nor conclusion 2 follows.

31. Answer: a

Explanation:

After the bifurcation of the undivided Andhra Pradesh and the creation of Telangana in 2014, Hyderabad continued as a shared capital of both states for a limited period. Andhra Pradesh then selected a new capital site in the Guntur district on the banks of the Krishna river.

This planned greenfield city, named after the ancient Satavahana capital, is Amaravati, which houses the state secretariat and legislative assembly. Hence, the new capital of Andhra Pradesh is Amaravati.

32. Answer: c

Explanation:

Simple interest is calculated by the formula $SI = \frac{P \times R \times T}{100}$, where P is principal, R is rate per annum and T is time in years. Here $P = 3250$, $R = 5.25$ and $T = 8$.

Substituting: $SI = \frac{3250 \times 5.25 \times 8}{100} = \frac{3250 \times 42}{100} = \frac{136500}{100} = 1365$. Hence, the interest earned is ₹ 1,365.

33. Answer: b

Explanation:

D is the odd one out.

Each term pairs two symbols: B8, KX, E3, LL. Three of them combine two different symbols — a letter with a digit (B8, E3) or a letter with a different letter (KX).

Only LL repeats the same symbol twice, so it does not share this 'two distinct symbols' property with the other three.

LL is the item labelled D.

Hence, D is the odd one out.

34. Answer: d

Explanation:

Average speed is defined as total distance divided by total time. Ram covers the length of the pond and swims back along the same path, so the total distance is 208 m. The total time taken is one minute, which equals 60 seconds.

Applying the formula: $\text{Average speed} = \frac{\text{Total distance}}{\text{Total time}} = \frac{208}{60} \approx 3.47 \text{ m/s}$. Hence, Ram's average speed is approximately 3.47 ms^{-1} .

35. Answer: b

Explanation:

When the ball is fully submerged, water rises by a volume equal to the ball's volume.

Volume of the sphere is $V = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi(5.6)^3 \text{ cm}^3$. Computing $5.6^3 = 175.616$, so $V = \frac{4}{3}\pi \times 175.616 \text{ cm}^3$.

The water rises in the cylindrical jar whose base area is $A = \pi R^2 = \pi(14)^2 = 196\pi \text{ cm}^2$.

Rise in level is $h = \frac{V}{A} = \frac{\frac{4}{3} \times 175.616}{196} \approx 1.19 \text{ cm}$. Hence, the water level rises by approximately 1.2 cm.

36. Answer: b

Explanation:

Leguminous crops belong to the family Fabaceae; their root nodules host nitrogen-fixing bacteria that enrich the soil with nitrogen. Gram, arhar, lentil, moong and urad are common examples, all of which are pulses.

Cereals such as wheat and rice and the cereal crop maize are grasses of the family Poaceae and do not fix nitrogen, while sesame is an oilseed crop of the family Pedaliaceae.

Hence, Pulses.

37. Answer: b

Explanation:

The Indira Gandhi Award for National Integration is given by the Indian National Congress to honour individuals and organisations contributing to national integration and communal harmony. For the year 2015-16 the award committee recognised a Carnatic vocalist who used classical music to bridge social divides.

The 30th award was conferred on Carnatic vocalist T. M. Krishna in recognition of his efforts to democratise classical music and promote communal harmony. Hence, T. M. Krishna received the 30th Indira Gandhi Award for National Integration.

38. Answer: b

Explanation:

Revenue from each item is proportional to its share of the total ₹ 35 lakh shown in the pie chart. Shares: Burger 25%, Sandwich 20%, Donuts 20%, Pizza 15%, other baked items 15% and Chinese 5%.

The smallest share is that of Chinese food items, 5%, giving $35 \times \frac{5}{100} = 1.75$ lakh, lower than every other item.

Hence, Chinese food items.

39. Answer: c

Explanation:

The Prithvi-II is a short-range surface-to-surface ballistic missile developed under India's Integrated Guided Missile Development Programme and is capable of carrying nuclear warheads. Its user trials are routinely conducted by the Strategic Forces Command from the Integrated Test Range at Chandipur on the Odisha coast.

On 21 February 2018 a successful night trial of Prithvi-II was conducted from Launch Complex-3 of the Integrated Test Range at Chandipur. Hence, the test range used for that night trial lies in Odisha.

40. Answer: a

Explanation:

Mathura Refinery was commissioned in January 1982 by Indian Oil Corporation Limited (IOCL) to meet the fuel demand of the north-western region, including the national capital. It stands on the Delhi–Agra Highway near the historic city of Mathura in Uttar Pradesh.

Within IOCL's chain of refineries built in order of commissioning (Barauni, Guwahati, Koyali, Haldia, Digboi and Mathura), Mathura is counted as the sixth refinery. Hence, Mathura Refinery is the 6th in IOCL's chain of refineries in the country.

41. Answer: c

Explanation:

Number the digits of the series 6 7 4 8 5 8 8 4 8 3 2 5 8 6 7 8 3 8 as positions 1 to 18. Each number of the group is formed by taking three digits that are three places apart in the series.

688 = positions 1, 4, 7 (6, 8, 8); 426 = positions 8, 11, 14 (4, 2, 6); 542 = positions 5, 8, 11 (5, 4, 2).

For 268 the only 2 is at position 11 and the 6 three places later is at position 14, but position 17 holds 3, not 8, so 268 cannot be formed by this rule.

Hence, 268.

42. Answer: b

Explanation:

In pattern completion problems the missing piece must match the surrounding pattern along every side where it meets another piece. Compare the shapes, shades and line continuations of each option with the edges adjacent to the blank portion of the main figure.

Only one option continues the lines, matches the inner shading and keeps the overall symmetry intact when placed in the gap. That option is the figure labelled B. Hence, the figure labelled B fits perfectly in the blank space.

43. Answer: a

Explanation:

Begin from the given identity $31 \times 23 = 713$. The expression to evaluate is 310×0.023 . Factor each number to make the comparison transparent: $310 = 31 \times 10$ and $0.023 = \frac{23}{1000}$.

Multiplying these: $310 \times 0.023 = 31 \times 10 \times \frac{23}{1000} = \frac{31 \times 23 \times 10}{1000} = \frac{7130}{1000} = 7.13$. Hence, $310 \times 0.023 = 7.13$.

44. Answer: a

Explanation:

An implicit assumption is one that must be true for the statement to make sense. The second part of the statement explicitly links ethics to the workplace, which clearly builds on assumption II that workplace ethics help in creating discipline and punctuality, so II is implicit.

Assumption I claims biometrics alone cannot enforce punctuality, but the statement calls biometrics a good tool and only adds that ethics are also important; it does not deny the ability of biometrics by itself. So I is not implicit. Hence, only assumption II is implicit.

45. Answer: b

Explanation:

Replace each operator according to the given substitutions: $\times$ becomes $+$, $+$ becomes $-$, $-$ becomes $\div$ and $\div$ becomes $\times$. The expression $28 \times 3 + 12 - 4 \div 10$ transforms into $28 + 3 - 12 \div 4 \times 10$.

Now apply the standard order of operations. Perform division and multiplication from left to right first: $12 \div 4 = 3$ and then $3 \times 10 = 30$. The expression reduces to $28 + 3 - 30$. Finally $28 + 3 - 30 = 1$. Hence, the required value is 1.

46. Answer: a

Explanation:

In an embedded figure problem the task is to find the answer figure in which the original figure appears exactly, preserving the proportions, orientation and connecting lines. Each answer figure is examined to see whether the lines of the given figure form part of its structure.

On careful inspection the lines of the given figure can be fully traced only within the figure labelled A; the other three figures either rotate, distort or add extra segments that break the match. Hence, the answer figure containing the given figure is A.

47. Answer: d

Explanation:

Analyse the three categories. Science is a broad subject that includes several disciplines, and both Physics and Biology are two distinct branches of Science. There is no shared ground between Physics and Biology because a given topic cannot simultaneously belong to both disciplines in a classification sense.

Hence, the appropriate Venn diagram shows one large circle for Science containing two separate, non-overlapping circles for Physics and Biology inside it. Hence, the correct Venn diagram is the one with two separate circles drawn inside one large circle.

48. Answer: b

Explanation:

In a mirror-image problem the reflected figure is produced by flipping the original along a vertical axis (the mirror). Left and right sides interchange while top and bottom remain the same; curves, letters and shaded parts reverse laterally.

Among the given options only one figure exactly reverses the original along a vertical line, with every element preserving its vertical position and swapping horizontal direction. That figure is the one labelled A. Hence, the mirror image of the given figure is A.

49. Answer: c

Explanation:

A convenient reference is that 1 January 2020 was a Wednesday. Count the days from 1 January to 31 March 2020. January has 31 days, February 2020 has 29 days (a leap year) and March has 31 days up to the 31st.

Days elapsed after 1 January up to 31 March = $(31 - 1) + 29 + 31 = 30 + 29 + 31 = 90$. Dividing 90 by 7 gives a remainder of 6. Counting six days forward from Wednesday (Thursday, Friday, Saturday, Sunday, Monday, Tuesday) lands on Tuesday. Hence, 31 March 2020 was a Tuesday.

50. Answer: c

Explanation:

Meristematic tissues are groups of actively dividing cells found at root tips, shoot tips and cambium regions. By continuous division they are responsible for the growth of a plant. As these new cells mature, they lose their power of further division and start to perform specialised functions.

Once the cells differentiate and acquire a fixed shape, size and function, they are called permanent tissue, which includes simple and complex tissues like parenchyma, xylem and phloem. Hence, meristematic tissue, after losing its dividing capacity, forms permanent tissue.

51. Answer: b

Explanation:

Pipe 1 full rate = $\frac{1}{2}$ tank/hour; pipe 2 full rate = $\frac{1}{4}$ tank/hour. Each hourly fraction is applied to the pipe's own full capacity.

Pipe 1 output in 5 hours = $\frac{1}{12} \cdot \frac{1}{2} + \frac{1}{9} \cdot \frac{1}{2} + \frac{1}{6} \cdot \frac{1}{2} + \frac{1}{4} \cdot \frac{1}{2} + \frac{1}{3} \cdot \frac{1}{2} = \frac{17}{36}$ tank.

Pipe 2 output in 5 hours (same fractions on $\frac{1}{4}$) = $\frac{17}{72}$ tank. Together they fill $\frac{17}{36} + \frac{17}{72} = \frac{51}{72} = \frac{17}{24}$ tank.

Let the outlet empty a full tank in y hours, so in 5 hours it removes $\frac{5}{y}$ tank. Half the tank is filled: $\frac{17}{24} - \frac{5}{y} = \frac{1}{2} \Rightarrow \frac{5}{y} = \frac{5}{24} \Rightarrow y = 24$. Hence, 24 hours.

52. Answer: a

Explanation:

Parenchyma is the most abundant and least specialised ground tissue in plants. Its cells are living, isodiametric, with thin primary cell walls made of cellulose and large central vacuoles.

These cells carry out basic functions such as photosynthesis (when they contain chloroplasts), storage of starch, oils and water, and secretion. Collenchyma has unevenly thickened walls that give flexible support, sclerenchyma has thick lignified walls for rigid support, and tracheids are dead water-conducting cells of xylem with lignified walls. Hence, Parenchyma.

53. Answer: c

Explanation:

The phrase 'one of the best designers' logically implies that a group of best designers exists, so there must be other good designers in the world besides him. Conclusion I is a direct implication of the statement.

Conclusion II claims a specific third rank, but the statement never gives a numerical position; it only places him within a top group. Assigning a precise rank is unsupported by the given information. Hence, Only conclusion I follows.

54. Answer: b

Explanation:

Nitrogen (N_2) is an inert, non-reactive diatomic gas that forms about 78% of the atmosphere. Because the triple bond in N_2 is extremely strong and the molecule has no reactive electrons under normal conditions, it does not readily combine with the oils and fats present in packaged foods.

Potato chip bags are therefore flushed with N_2 before sealing. This displaces oxygen, prevents oxidation and rancidity of the oil, keeps the chips crisp and cushions them against breakage during transport. Oxygen would oxidise, chlorine is toxic and reactive, and hydrogen is flammable. Hence, N_2 .

55. Answer: a

Explanation:

In simple interest, Amount $A = P \left(1 + \frac{RT}{100} \right)$ where P is the principal, R is the annual rate and T is the time in years.

Here $R = 8\%$ and $T = \frac{27}{4}$ years, so $\frac{RT}{100} = \frac{8 \times 27}{4 \times 100} = \frac{54}{100}$. Therefore $A = P \times \frac{154}{100}$.

Given $A = 924$: $P = \frac{924 \times 100}{154} = \frac{92400}{154} = 600$. Hence, Rs. 600.

56. Answer: b

Explanation:

In the human female reproductive tract, the external vagina opens internally at its upper end into the cervix, which is the narrow, muscular lower neck of the uterus. Only through the cervical canal does the vaginal cavity connect to the uterine cavity.

The uterus lies above the cervix, and the fallopian tubes (oviducts) extend sideways from the top of the uterus towards the ovaries. Therefore the vagina does not open directly into the uterus or fallopian tubes; it first opens into the cervix. Hence, Cervix.

57. Answer: d**Explanation:**

For any simple convex polygon with n sides, the sum of the interior angles is given by the formula $S = (n - 2) \times 180^\circ$. This comes from the fact that an n -gon can be divided into $(n - 2)$ triangles by drawing diagonals from one vertex.

An octagon has $n = 8$ sides, so $S = (8 - 2) \times 180^\circ = 6 \times 180^\circ = 1080^\circ$. Hence, 1080.

58. Answer: b**Explanation:**

The Lata Mangeskar Lifetime Achievement Award is instituted by the Government of Maharashtra to honour veteran contributors to Hindi film music. The award carries a citation, a shawl and a cash prize, and is presented each year on the recommendation of a jury.

For the year 2016 it was conferred on the noted music director Uttam Singh, whose works include scores for 'Dil To Pagal Hai' and 'Gadar: Ek Prem Katha'. Hence, Uttam Singh.

59. Answer: d

Explanation:

Retardation (deceleration) is simply negative acceleration, that is, the rate of decrease of velocity with respect to time. Dimensionally and numerically its magnitude has exactly the same unit as acceleration.

Acceleration is defined as change in velocity per unit time: unit of velocity is $m s^{-1}$ and dividing by time (seconds) gives $m s^{-2}$. Therefore the SI unit of retardation is $m s^{-2}$. Hence, $m s^{-2}$.

60. Answer: c

Explanation:

Write $0.9 = \frac{9}{10}$, so $\sqrt{0.9} = \frac{\sqrt{9}}{\sqrt{10}} = \frac{3}{\sqrt{10}}$. Rationalising, $\sqrt{0.9} = \frac{3\sqrt{10}}{10}$.

Using $\sqrt{10} \approx 3.1623$, we get $\sqrt{0.9} \approx \frac{3 \times 3.1623}{10} \approx \frac{9.4868}{10} \approx 0.9487 \approx 0.948$. Hence, 0.948.

61. Answer: c

Explanation:

A strong argument must address the issue seriously, be rational and have a universal, substantiated basis. Argument I links the ban to visitor safety, which is a real public-interest reason; wild animals can injure visitors who come close during feeding, and the food can also harm the animals. This is a serious, defensible rationale.

Argument II merely says feeding is fun. Personal entertainment is not a weighty public-policy reason and does not address health or safety. It is therefore a weak argument. Hence, Only argument I is strong.

62. Answer: b

Explanation:

Human somatic cells contain 23 pairs of chromosomes: 22 pairs of autosomes and one pair of sex chromosomes. The sex chromosomes determine biological sex at fertilisation.

A human female inherits one X chromosome from each parent, giving her the homogametic pair XX. A human male has one X and one Y chromosome (XY) and is heterogametic. YY and YYX combinations do not occur as normal human genotypes. Hence, XX.

63. Answer: b

Explanation:

The relationship between 'Work' and 'Office' is activity-to-place: an office is the standard place where work is carried out.

Applying the same place relationship to 'Exercise', the standard place where people go to exercise is the gym. Weight loss is a result of exercise, swimming and walking are forms of exercise, not places. Hence, Gym.

64. Answer: b

Explanation:

In a pie chart each sector represents the percentage share of the total. The amount spent on any head equals total expenditure multiplied by that sector's share.

The sector for employee income in the given pie chart represents 20% of the total.

Therefore the amount spent on employee income is 20% of Rs. 100 lakh crore =

$$\frac{20}{100} \times 100 = 20 \text{ lakh crore. Hence, Rs. 20 lakh crore.}$$

65. Answer: c

Explanation:

Ohm's law states that, at a constant temperature, the current flowing through a metallic conductor is directly proportional to the potential difference applied across its two ends: $V = IR$, where R is the resistance.

The two directly related quantities are therefore potential difference (V) and electric current (I). Electric charge and time appear in the definition of current ($I = Q/t$) but not in Ohm's law itself. Hence, Potential difference, electric current.

66. Answer: d

Explanation:

Among hydrocarbons, reactivity rises with unsaturation: alkynes with a triple bond and alkenes with a double bond readily undergo addition reactions because of their π electrons.

Ethyne is an alkyne, while ethene and propene are alkenes, so all three are reactive. Propane is a saturated alkane with only single C–C and C–H bonds and takes part mainly in slow substitution reactions.

Hence, Propane.

67. Answer: b

Explanation:

The Dr. A.P.J. Abdul Kalam National Memorial was built by DRDO at Pei Karumbu in Rameswaram, Tamil Nadu, at the place where Dr. Kalam was laid to rest.

It was inaugurated on 27 July 2017, Dr. Kalam's second death anniversary, by Prime Minister Narendra Modi in the presence of Tamil Nadu Chief Minister K. Palaniswami and other dignitaries.

Hence, Narendra Modi.

Note: The official RRB answer key marked O. Panneerselvam, but the memorial was inaugurated by Prime Minister Narendra Modi on 27 July 2017, so the correct answer is given here.

68. Answer: a

Explanation:

The Nari Shakti Puraskar is the national award of the Ministry of Women and Child Development, presented by the President on International Women's Day to women and institutions working for women's empowerment.

On 8 March 2018 President Ram Nath Kovind presented the Nari Shakti Puraskar for 2017 at Rashtrapati Bhavan; Malvika Iyer, a bomb-blast survivor and disability-rights activist, was among the women honoured.

Hence, Malvika Iyer.

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

69. Answer: a

Explanation:

Each Indian state has designated official state symbols including a state animal, state bird, state flower and state tree.

The state animal of Andhra Pradesh is the Blackbuck (*Antelope cervicapra*), locally called Krishna Mrig. It is a slender antelope native to the Indian subcontinent, often seen in the open plains of Andhra Pradesh and listed as 'Least Concern' by the IUCN but protected under the Wildlife (Protection) Act, 1972. Hence, Blackbuck.

70. Answer: c

Explanation:

Innermost bracket first: $6 \times 5 = 30$, then $120 \div 30 = 4$ and $25 - 4 = 21$.

Curly bracket: $105 \div 21 = 5$. Square bracket: $47 + 5 = 52$.

Finally $156 \div 52 = 3$.

Hence, 3.

71. Answer: d

Explanation:

In the metal reactivity series, metals above hydrogen (K, Na, Ca, Mg, Al, Zn, Fe, Pb) can displace hydrogen from dilute non-oxidising acids such as dilute HCl, liberating H_2 gas and forming the corresponding chloride.

Copper lies below hydrogen in the series, so it cannot displace H^+ ions from dilute HCl and no reaction occurs. Aluminium, magnesium and zinc are all above hydrogen and react readily with dilute HCl. Hence, Copper.

72. Answer: b

Explanation:

The median is the middle value of a data set once the observations are arranged in ascending order. For n observations (odd), the median is the $\left(\frac{n+1}{2}\right)^{\text{th}}$ value.

Arranging the 11 given numbers in ascending order: 10, 11, 12, 13, 13, 15, 15, 16, 18, 20, 27.
With $n = 11$, the median position is $\frac{11+1}{2} = 6^{\text{th}}$. The 6th value is 15. Hence, 15.

73. Answer: a

Explanation:

If $a : b :: c : d$, then d is called the fourth proportional to a, b, c and satisfies $\frac{a}{b} = \frac{c}{d}$, which gives $d = \frac{b \times c}{a}$.

Taking $a = 3, b = 4, c = 9$, the fourth proportional is $d = \frac{4 \times 9}{3} = \frac{36}{3} = 12$. Hence, 12.

74. Answer: a

Explanation:

In household electricity measurement, 1 unit of energy equals 1 kilowatt-hour (kWh), the energy consumed when a 1 kW load runs for 1 hour.

Converting to SI units: $1 \text{ kWh} = 1000 \text{ W} \times 3600 \text{ s} = 3.6 \times 10^6 \text{ J}$. Therefore $100 \text{ units} = 100 \times 3.6 \times 10^6 = 3.6 \times 10^8 \text{ J}$. The 5-day span is only to describe consumption; it does not change the total energy. Hence, $3.6 \times 10^8 \text{ J}$.

75. Answer: b

Explanation:

For a fixed amount of work, the total man-days needed stays the same, so $M_1 \times D_1 = M_2 \times D_2$, where M is number of workers and D is the number of days.

Here $M_1 = 30$, $D_1 = 12$, $M_2 = 40$. Therefore $D_2 = \frac{M_1 \times D_1}{M_2} = \frac{30 \times 12}{40} = \frac{360}{40} = 9 \text{ days}$.
Hence, 9.

76. Answer: b

Explanation:

Khelo India is a flagship national programme launched by the Government of India in 2018 under the Ministry of Youth Affairs and Sports to revive the sports culture at the grass-root level. It identifies young talent across the country, provides long-term financial and training support, and strengthens sporting infrastructure in schools, colleges and universities.

Flagship events held under the programme include the Khelo India Youth Games, Khelo India University Games and Khelo India Winter Games, covering disciplines such as athletics, kabaddi, hockey, wrestling and swimming. The scheme is clearly a sports-development initiative and has no link with science, music or literature.

Hence, Sports.

77. Answer: b

Explanation:

Students who play at least two games are those who lie in exactly two of the three regions (M and N only, N and L only, M and L only) plus those who lie in all three regions (M, N and L).

Adding the four overlapping regions from the given Venn diagram gives a total of 30 students who play two or more games together, while the remaining students play only one game and are therefore excluded from this count.

Hence, 30.

78. Answer: a

Explanation:

The Dronacharya Award is the highest sporting honour given by the Government of India to coaches who have produced outstanding sportspersons at national and international competitions. It is awarded annually by the Ministry of Youth Affairs and Sports.

In 2017, Heera Nand Kataria was conferred the Dronacharya Award in the field of Kabaddi for his contribution as a coach to Indian kabaddi. The other names listed are prominent kabaddi players and not coaches recognised with this award in 2017.

Hence, Heera Nand Kataria.

79. Answer: d

Explanation:

The ampere (symbol A) is one of the seven base units of the SI system. It measures the rate of flow of electric charge through a conductor, defined as one coulomb of charge passing a point per second.

In contrast, resistance is measured in ohm, electric charge in coulomb and potential difference in volt. Only electric current has the ampere as its SI unit.

Hence, Electric current.

80. Answer: c

Explanation:

Solid carbon dioxide (CO_2) is commonly called dry ice because it looks like ice but does not wet surfaces. At atmospheric pressure solid CO_2 does not melt into a liquid; instead it directly turns into gaseous CO_2 , a process known as sublimation.

Therefore statement A is correct, statement C is correct and statement B is incorrect because solid CO_2 never changes into a liquid at normal atmospheric pressure.

Hence, A and C are correct, B is wrong.

Your Personal Exams Guide

81. Answer: c

Explanation:

In 1905 Albert Einstein proposed his famous mass-energy equivalence relation $E = mc^2$, which states that mass and energy are two forms of the same physical entity and can be converted into each other. This idea became the theoretical foundation of nuclear physics.

Joseph Proust is known for the law of definite proportions, Jacques Charles for Charles's law of gases, and Robert Boyle for Boyle's law of gases. None of them

established the inter-conversion of matter and energy.

Hence, Albert Einstein.

82. Answer: d

Explanation:

Muhammad-bin-Tughlaq, who ruled the Delhi Sultanate from 1325 to 1351 CE, decided in 1327 CE to shift his capital from Delhi to Devagiri in the Deccan, which he renamed Daulatabad. The move was intended to control the Deccan more effectively.

Due to the hardship of the long migration and difficulties of administration, he had to shift the capital back to Delhi a few years later. Iltutmish, Balban and Akbar never shifted their capital to Daulatabad.

Hence, Muhammad-bin-Tughlaq.

83. Answer: a

Explanation:

In a classification type question of non verbal reasoning, the four given figures are compared on the basis of common properties such as the number of sides, type of shading, direction of arrows, symmetry or the position of elements inside the main figure.

On comparing the four figures, three of them share the same property while figure C alone has a different structure or orientation and does not match the pattern formed by the other three.

Hence, C.

84. Answer: a

Explanation:

The period number of an element in the modern periodic table is equal to the number of occupied principal energy shells (K, L, M, N, ...) in its atom.

The given electronic configuration 2, 8, 8, 2 corresponds to electrons distributed in four shells (K = 2, L = 8, M = 8, N = 2). Therefore the element has electrons up to the fourth shell and is placed in the 4th period of the modern periodic table. The total number of electrons is 20, which corresponds to calcium (Ca).

Hence, 4.

85. Answer: d

Explanation:

In mechanics the work done on an object is defined by the relation $W = Fs \cos \theta$, where F is the applied force, s is the displacement of the object and θ is the angle between the direction of the force and the direction of displacement.

This expression contains only force, displacement and the angle between them. The mass of the object does not appear directly in the formula, so the work done is independent of the mass of the body.

Hence, Mass of the object.

86. Answer: d

Explanation:

Let the present age of the daughter be d years. Then the present age of the mother is $(50 - d)$ years, since their combined age is 50 years.

After 5 years, the daughter's age becomes $(d + 5)$ years and the mother's age becomes $(50 - d + 5) = (55 - d)$ years. By the condition, mother's age after 5 years will be 4 times the daughter's age after 5 years, so $(55 - d) = 4(d + 5)$.

Solving, $55 - d = 4d + 20$, which gives $5d = 35$ and hence $d = 7$. The daughter's present age is therefore 7 years, with the mother's present age being 43 years.

Hence, 7 years.

87. Answer: d

Explanation:

Captain Amarinder Singh of the Indian National Congress was sworn in as the Chief Minister of Punjab on 16 March 2017 after the Congress won the state assembly elections. He continued to hold the office in 2018 and in March 2018 was the serving Chief Minister of Punjab.

Prakash Singh Badal of the Shiromani Akali Dal had served as the Chief Minister earlier but had demitted office in March 2017. Navjot Singh Sidhu was a cabinet minister in Punjab but not the Chief Minister.

Hence, Captain Amarinder Singh.

88. Answer: b

Explanation:

The given sequence is 1, 8, 27, 64, ?, 216, ... On observation each term is a perfect cube of a natural number: $1 = 1^3$, $8 = 2^3$, $27 = 3^3$, $64 = 4^3$ and $216 = 6^3$.

Hence the missing term corresponds to 5^3 , which equals 125. This fits perfectly between 64 and 216 in the natural order of cubes.

Hence, 125.

89. Answer: a

Explanation:

A quadratic equation $ax^2 + bx + c = 0$ has no real solution when its discriminant is negative, i.e. $b^2 - 4ac < 0$.

For the given equation $6x^2 + 2kx + k = 0$, we have $a = 6$, $b = 2k$ and $c = k$. The discriminant becomes $(2k)^2 - 4 \cdot 6 \cdot k = 4k^2 - 24k = 4k(k - 6)$.

For no real solution, $4k(k - 6) < 0$, which gives $k(k - 6) < 0$. This inequality holds when k lies between 0 and 6, i.e. $0 < k < 6$.

Hence, $0 < k < 6$.

90. Answer: c

Explanation:

Heinrich Rudolf Hertz, a German physicist, experimentally demonstrated the existence of electromagnetic waves in 1887 and verified James Clerk Maxwell's electromagnetic theory. He showed that these invisible waves could be transmitted and detected through space.

His pioneering work on the generation and detection of electromagnetic waves became the scientific foundation for later technological developments such as radio, telephone, telegraph and television. The SI unit of frequency hertz (Hz) is named in his honour.

Hence, Heinrich Rudolf Hertz.

91. Answer: a

Explanation:

Using the standard identity for the cube of a sum, we have $(a + \frac{1}{a})^3 = a^3 + \frac{1}{a^3} + 3(a + \frac{1}{a})$.

Substituting the given value $a + \frac{1}{a} = 5$ gives $5^3 = a^3 + \frac{1}{a^3} + 3 \times 5$, i.e. $125 = a^3 + \frac{1}{a^3} + 15$.

Solving, $a^3 + \frac{1}{a^3} = 125 - 15 = 110$.

Hence, 110.

92. Answer: c

Explanation:

Uhuru Muigai Kenyatta of the Jubilee Party won the 2017 Kenyan presidential election and was sworn in for his second term on 28 November 2017, serving as President throughout 2018.

Raila Odinga was the opposition leader, and Jomo Kenyatta, Kenya's first President and Uhuru's father, died in 1978.

Hence, Uhuru Muigai Kenyatta.

93. Answer: d

Explanation:

A pentagon is a closed plane figure bounded by exactly five straight line segments. In a counting figures problem of this kind, every closed region of the composite diagram is examined and only those with five sides are counted.

On a careful inspection of the given figure, the simple pentagons formed by the inner lines together with the pentagons formed by combining two or more of those smaller regions give a total of 12 pentagons.

Hence, 12.

94. Answer: a

Explanation:

From statement 1 some albums are photos, and from statement 2 all photos are frames. Combining the two, those albums which are photos must also be frames, because every photo is a frame. Therefore conclusion 1 some albums are frames logically follows.

Conclusion 2 says no photo is an album. However, the first statement actually asserts that some albums are photos, which by converse implies that some photos are albums. Hence conclusion 2 directly contradicts the given information and does not follow.

Hence, Only (1) follows.

95. Answer: b

Explanation:

Rajiv Gandhi served as Prime Minister from 1984 to 1989. He was assassinated in May 1991 and was conferred the Bharat Ratna posthumously the same year.

Morarji Desai received the Bharat Ratna in 1991 while he was alive, and neither Chandra Shekhar nor I. K. Gujral has been awarded the Bharat Ratna.

Hence, Rajiv Gandhi.

96. Answer: c

Explanation:

The only brother of Suman's sisters is either Suman himself or Suman's brother; in both cases he has the same father as Suman.

So the father of that only brother is Suman's father, and the mother of Suman's father is Suman's paternal grandmother.

Hence, Grandmother.

97. Answer: a

Explanation:

A fraction in its simplest form gives a terminating decimal if and only if the prime factorisation of its denominator contains no prime other than 2 and 5.

Simplifying each option: $\frac{9}{72} = \frac{1}{8}$ where $8 = 2^3$, so this is terminating and equals 0.125.
 $\frac{6}{72} = \frac{1}{12}$ where $12 = 2^2 \times 3$, denominator has factor 3, non terminating. $\frac{3}{72} = \frac{1}{24}$ where $24 = 2^3 \times 3$, non terminating. $\frac{12}{72} = \frac{1}{6}$ where $6 = 2 \times 3$, non terminating.

Hence, $\frac{9}{72}$.

98. Answer: a

Explanation:

For a body falling freely from rest under gravity, the velocity acquired after time t is given by the first equation of motion $v = u + gt$, where u is the initial velocity, g is the acceleration due to gravity and t is the time of fall.

Here the car starts from rest, so $u = 0$, $g = 10 \text{ ms}^{-2}$ and $t = 0.5 \text{ s}$. Substituting gives $v = 0 + 10 \times 0.5 = 5 \text{ ms}^{-1}$.

So the car hits the ground with a speed of 5 ms^{-1} .

Hence, 5 ms^{-1} .

99. Answer: a

Explanation:

Each group of the series has four letters. The 1st and 3rd letters move forward in the alphabet by 2 each time, while the 2nd and 4th letters move backward in the alphabet by 2 each time.

Position 1: A, C, E, ?, I, which gives G. Position 2: Z, X, V, ?, R, which gives T. Position 3: B, D, F, ?, J, which gives H. Position 4: Y, W, U, ?, Q, which gives S.

Combining the four letters gives the missing term as GTHS.

Hence, GTHS.

100. Answer: b

Explanation:

Observe how BASKET is coded. Split BASKET into three pairs of consecutive letters: BA, SK, ET. In each pair the two letters are swapped: BA becomes AB, SK becomes KS

and ET becomes TE. Joining the swapped pairs gives $AB + KS + TE = ABKSTE$, which matches the given code.

Applying the same rule to ACTIVE: split into AC, TI, VE. Swapping each pair gives CA, IT, EV. Joining the three swapped pairs gives $CA + IT + EV = CAITEV$.

Hence, CAITEV.

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