

## Answers

### 1. Answer: a

#### Explanation:

Sperms (spermatozoa) are produced in the seminiferous tubules of the testes through the process of spermatogenesis.

The prostate gland and seminal vesicles produce fluids that mix with sperm to form semen but do not produce sperms.

The scrotum is the sac that holds the testes at a temperature slightly below body temperature required for spermatogenesis.

Hence, **In the testes.**

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### 2. Answer: b

#### Explanation:

Add the positive values first:  $5.032 + 150.03 + 40.00 = 195.062$ .

Now subtract 30.50:  $195.062 - 30.50 = 164.562$ .

Careful alignment of decimal places gives the exact result.

Hence, **164.562.**

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### 3. Answer: d

#### Explanation:

Statement 4 is INCORRECT — it describes the reaction of ACIDS with bicarbonates producing  $\text{CO}_2$ ,  $\text{H}_2\text{O}$  and salts (e.g.,  $\text{HCl} + \text{NaHCO}_3 \rightarrow \text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$ ).

Bases don't typically react with bicarbonates this way.

Statements 1, 2, 3 correctly describe bases: they release  $\text{OH}^-$  in aqueous solution, taste bitter, and turn red litmus blue.

Hence, They react with metals and bicarbonates to form  $\text{H}_2\text{O}$ ,  $\text{CO}_2$  and salts..

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#### 4. Answer: d

##### Explanation:

Let the number be  $x$ .

Then  $(25/3)\%$  of  $x = 150$ , i.e.,  $x \times (25/3)/100 = 150$ , so  $x \times 25/300 = 150$ .

Solving:  $x = 150 \times 300/25 = 150 \times 12 = 1800$ .

Hence, 1800.

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#### 5. Answer: b

##### Explanation:

Total CP (including repair) =  $\text{SP} / (1 + \text{profit}\%) = 58000 / 1.16 = ₹50,000$ .

Since repair cost was ₹3,000, the amount paid to purchase =  $50,000 - 3,000 = ₹47,000$ .

Hence, ₹47,000.

**6. Answer: b**

**Explanation:**

Butterflies come from caterpillars — caterpillar is the immature/early stage of a butterfly.

Analogously, a mother produces a baby — baby is the immature/early form of a person.

The relationship is 'adult form : young form'.

Aunt, father and son are family relations, not developmental stages.

Hence, **Baby**.

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**7. Answer: c**

**Explanation:**

As of August 2018, the Telugu Desam Party (TDP) led by Chief Minister N.

Chandrababu Naidu was in power in Andhra Pradesh.

TDP had won the 2014 Andhra Pradesh Legislative Assembly election.

TRS (Telangana Rashtra Samithi) was ruling neighbouring Telangana, not AP.

Hence, **TDP**.

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**8. Answer: d**

**Explanation:**

Balkrishna Doshi is an eminent Indian architect who won the Pritzker Architecture Prize in 2018, the first Indian to receive this prestigious international award.

He is known for designing landmark projects like the Indian Institute of Management Bangalore and CEPT University campuses.

He was also awarded the Padma Shri and Padma Bhushan.

Hence, **Architecture**.

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#### 9. Answer: d

##### Explanation:

Apply BODMAS: inner bracket first  $(2+3) = 5$ .

Curly bracket:  $5 - 11 = -6$ .

Compute  $4^2 = 16$ .

Multiply:  $16 \times (-6) = -96$ .

Hence, **-96**.

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#### 10. Answer: a

##### Explanation:

Akbar (r.

1556–1605) pursued a policy of religious tolerance called 'Sulh-i-Kul' (universal peace).

He granted high court positions to Rajputs — Raja Todar Mal (Revenue Minister), Raja Man Singh, Raja Birbal — cementing Rajput-Mughal alliances.

He also abolished the jizya tax on non-Muslims.

Hence, **Rajputs**.

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**11. Answer: c**

**Explanation:**

Convert ratio  $1/2 : 1/3 : 1/4$  to whole numbers by multiplying each by LCM 12:  $6 : 4 : 3$ .

Sum of parts = 13.

First child's share =  $286 \times 6/13 = 22 \times 6 = 132$ .

Hence, **132**.

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**12. Answer: c**

**Explanation:**

National Civil Services Day is celebrated on 21 April every year in India.

On this day in 1947, Sardar Vallabhbhai Patel addressed the first batch of civil servants at Metcalfe House, Delhi, calling them the 'Steel Frame of India'.

The day recognises the work of civil servants.

Hence, **21 April**.

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**13. Answer: c**

**Explanation:**

A withdrew  $108000 \times (320/720) = ₹48,000$ ; B withdrew ₹60,000 (at 4 months).

A's capital-months =  $320000 \times 4 + 272000 \times 8 = 3,456,000$ .

B's =  $400000 \times 4 + 340000 \times 8 = 4,320,000$ .

C's =  $108000 \times 8 = 864,000$ .

Ratio A:B:C =  $3456:4320:864 = 4:5:1$ .

Total parts = 10.

Shares from ₹51,840: A = 20,736; B = 25,920; C = 5,184.

Hence, **20736, 25920, 5184**.

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**14. Answer: a**

**Explanation:**

Sulphur belongs to Group 16 (chalcogens).

It is used in the vulcanisation of rubber, a process that hardens rubber and improves elasticity and strength.

When reacted with hot concentrated  $\text{HNO}_3$ , sulphur is oxidised to sulphuric acid:  $\text{S} + 6\text{HNO}_3 \rightarrow \text{H}_2\text{SO}_4 + 6\text{NO}_2 + 2\text{H}_2\text{O}$ .

Oxygen is also Group 16 but does not form  $\text{H}_2\text{SO}_4$  this way.

Hence, **Sulphur**.

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**15. Answer: b**

**Explanation:**

The 23rd Winter Olympic Games were held in Pyeongchang, South Korea from 9 to 25 February 2018.

Norway topped the medal table with 39 medals.

India was represented by two athletes: Shiva Keshavan (luge) and Jagdish Singh (cross-country skiing).

Hence, **9 February to 25 February, 2018.**

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**16. Answer: a**

**Explanation:**

Amphioxus (also called Branchiostoma or lancelet) belongs to subphylum Cephalochordata under Protochordata.

Protochordates lack a true vertebral column but possess a notochord.

Rohu, dogfish and tuna are all true fishes belonging to subphylum Vertebrata (having a backbone).

Hence, **Amphioxus.**

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**17. Answer: b**

**Explanation:**

Lord Wellesley introduced the Subsidiary Alliance system in 1798.

The Nizam of Hyderabad, Nizam Ali Khan (Asaf Jah II), was the first Indian ruler to accept it in September 1798.

Under this treaty, the Nizam accepted British troops for protection and agreed to pay for their maintenance.

Later Mysore, Awadh and Marathas also entered such alliances.

Hence, 1798.

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18. Answer: a

**Explanation:**

The series is a geometric progression with common ratio  $r = 2$ : each term doubles the previous.

$9 \rightarrow 18 \rightarrow 36 \rightarrow 72 \rightarrow 144 \rightarrow ?$  Multiplying 144 by 2 gives 288.

Hence, 288.

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19. Answer: d

**Explanation:**

Work done  $W = \text{Force} \times \text{displacement}$  (when force and displacement are along the same direction), i.e.,  $W = F \cdot s$ .

Its SI unit is joule (J) or  $\text{N}\cdot\text{m}$ .

Pressure = Force/Area, Thrust = perpendicular force on a surface, and Energy is the capacity to do work — none equals  $F \times s$  directly.

Hence, Work.

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20. Answer: c

**Explanation:**

e-Sanad is the web portal launched by the Ministry of External Affairs, Government of India, for online verification and attestation of educational and personal documents.

It streamlines the process for students and professionals going abroad who need document apostille/attestation.

The portal integrates issuing authorities across states for authentic verification.

Hence, **e-Sanad**.

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**21. Answer: a**

**Explanation:**

Quarterly total sales = ₹1,50,000.

Non-shake share =  $100 - 85 = 15\%$ .

Non-shake quarterly =  $15\% \times 150000 = ₹22,500$ .

Monthly non-shake =  $22500/3 = ₹7,500$ .

Hence, **₹7,500**.

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**22. Answer: a**

**Explanation:**

Selling Price = Cost Price  $\times (1 + \text{profit}\%/100) = 1525 \times (1 + 12/100) = 1525 \times 1.12$ .

Compute:  $1525 \times 1.12 = 1525 + 1525 \times 0.12 = 1525 + 183 = ₹1,708$ .

Hence, **₹1,708**.

23. Answer: a

**Explanation:**

'No One Can Pronounce My Name' is a 2017 novel written by Rakesh Satyal, an Indian-American author.

The novel explores the lives of Indian immigrants in Cleveland, Ohio, dealing with themes of identity, loneliness and belonging.

It was named one of the best books of 2017 by NPR and The Washington Post.

Hence, **Rakesh Satyal**.

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24. Answer: c

**Explanation:**

During Vietnamese President Tran Dai Quang's state visit to India in March 2018, India and Vietnam signed three agreements aimed at strengthening cooperation in nuclear energy, agriculture and trade, with a shared vision for a free, open and prosperous Indo-Pacific region.

Vietnam is a key partner in India's Act East Policy.

Hence, **Vietnam**.

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25. Answer: c

**Explanation:**

Apply BODMAS.

Inside brackets:  $13 \div 5 = 2.6$ ;  $2.6 \times 3 = 7.8$ ;  $5 \times 2 = 10$ .

So bracket =  $12 + 7.8 - 10 = 9.8$ .

Now:  $40 - 2 \times 9.8 + 19 = 40 - 19.6 + 19 = 39.4$ .

Hence, **39.4**.

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**26. Answer: b**

**Explanation:**

Let ages be  $a$  and  $b$ .  $a + b = 35$ ,  $ab = 300$ .

They are roots of  $x^2 - 35x + 300 = 0$ .

Discriminant =  $1225 - 1200 = 25$ , so  $x = (35 \pm 5)/2 = 20$  or  $15$ .

Current ages:  $20$  and  $15$ .

Next year:  $21$  and  $16$ .

Hence, **21 years and 16 years**.

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**27. Answer: d**

**Explanation:**

$A = B$ .

$A + B + C = 5C \rightarrow 2A + C = 5C \rightarrow 2A = 4C \rightarrow A = 2C$ .

Three years ago:  $A - 3 = 3(C - 3) \rightarrow 2C - 3 = 3C - 9 \rightarrow C = 6$ .

Four years from now,  $C = 6 + 4 = 10$ .

Hence, **10 years**.

28. Answer: c

**Explanation:**

The question presents a visual pattern where a specific relationship links the given figures.

Careful inspection of shapes, positions, rotations or shading reveals the transformation rule.

Applying the same rule to the missing position identifies figure C as the correct fit.

29. Answer: c

**Explanation:**

Matter changes state (solid  $\leftrightarrow$  liquid  $\leftrightarrow$  gas) through absorption or release of thermal (heat) energy.

Absorbing heat: melting (solid $\rightarrow$ liquid), vaporisation (liquid $\rightarrow$ gas).

Releasing heat: condensation (gas $\rightarrow$ liquid), freezing (liquid $\rightarrow$ solid).

Pressure change can also cause state change but the most general answer is thermal energy exchange.

Hence, **By absorbing and releasing thermal energy.**

30. Answer: c

**Explanation:**

Total 'reading events' = students  $\times$  papers per student =  $480 \times 5 = 2,400$ .

Same total from paper side = number of papers  $\times$  readers per paper =  $N \times 60 = 2400$ .

So  $N = 2400/60 = 40$  papers exactly.

Hence, **exactly 40**.

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**31. Answer: a**

**Explanation:**

By Newton's laws, force is a push or pull that changes the state of motion of a body – it can start motion in a stationary body or stop/slow down a moving body.

SI unit: newton (N).

Watt is the unit of power, work is force  $\times$  displacement, and joule is the unit of energy or work.

Hence, **Force**.

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**32. Answer: d**

**Explanation:**

Statement 1 alone: Y is after K and U, but the order of K and U is unknown.

Statement 2 alone: K before U, but position of Y is unknown.

Combining both: K before U (from 2), Y after both K and U (from 1)  $\rightarrow$  order K, U, Y.

First patient = K.

Hence, **Statements 1 and 2 together are sufficient**.

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33. Answer: a

Explanation:

Using the day-of-week calculation for 1 August 1987: January 1, 1987 was a Thursday.

Days from Jan 1 to Aug 1 =  $31+28+31+30+31+30+31+1 = 213$  days (day 213 from Jan 1).

Days elapsed after Jan 1 = 212.

$212 \div 7$  gives remainder 2.

Thursday + 2 = Saturday.

Hence, **Saturday**.

34. Answer: d

Explanation:

Solution:

Let the three angles of the triangle be  $3k^\circ$ ,  $4k^\circ$ , and  $5k^\circ$ .

Since the sum of the angles of a triangle is  $180^\circ$ :

$$3k + 4k + 5k = 180^\circ$$

$$12k = 180^\circ$$

Therefore,

$$k = 15^\circ$$

Hence, the angles are:

$$3(15^\circ) = 45^\circ, \quad 4(15^\circ) = 60^\circ, \quad 5(15^\circ) = 75^\circ$$

Hence, the angles are  $45^\circ$ ,  $60^\circ$ , and  $75^\circ$ .

35. Answer: a

**Explanation:**

Running is a faster movement, walking is slower — they are opposites in terms of pace.

Analogously, rush (haste, hurry) is opposite in pace to slow (leisurely, unhurried).

The relationship is 'fast pace : slow pace'.

Bus, sweat and quick don't complete the opposite-pace analogy.

Hence, **Slow**.

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36. Answer: b

**Explanation:**

Code = sum of position values of letters (A=1, B=2, ..., Z=26).

BOX:  $B(2) + O(15) + X(24) = 41 \checkmark$ .

MAP:  $M(13) + A(1) + P(16) = 30 \checkmark$ .

RAT:  $R(18) + A(1) + T(20) = 39$ .

Hence, **39**.

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37. Answer: c

**Explanation:**

Let holiday value = H and weekly wage = w.

Then  $7w = 500 + H$  (Eq 1) and  $5w = 50 + H$  (Eq 2).

Subtract:  $2w = 450 \rightarrow w = 225$ .

Substitute into Eq 2:  $5 \times 225 = 1125 = 50 + H \rightarrow H = ₹1,075$ .

Hence, ₹1,075.

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**38. Answer: a**

**Explanation:**

Argument I is strong — a real, structural solution: limiting car sales addresses the increasing traffic and cyclist safety at systemic level.

Argument II is weak — it assumes universal compliance with driving rules, which is unrealistic and doesn't address the root cause of the cyclist hazard from sheer volume of vehicles.

Hence, Only argument I is strong.

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**39. Answer: d**

**Explanation:**

LCM(21, 35, 175):  $21 = 3 \cdot 7$ ,  $35 = 5 \cdot 7$ ,  $175 = 5^2 \cdot 7$ .

$LCM = 3 \cdot 5^2 \cdot 7 = 525$ .

For a perfect square, all prime factors must have even powers.

$525 = 3 \cdot 5^2 \cdot 7$  needs factors 3 and 7 to become even  $\rightarrow$  multiply by  $3 \cdot 7 = 21$ .

So required number  $= 525 \times 21 = 11,025 = 105^2$ .

Hence, 11025.

40. Answer: c

**Explanation:**

The Food Safety and Standards Authority of India (FSSAI) has its headquarters in New Delhi.

It was established under the Food Safety and Standards Act, 2006, and operates under the Ministry of Health and Family Welfare.

FSSAI is responsible for regulating and supervising food safety, and the current CEO reports to the Union Health Ministry.

Hence, **New Delhi**.

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41. Answer: b

**Explanation:**

The next two primes greater than 3 are 5 and 7.

Smallest number divisible by 3, 5 and 7 is their LCM.

Since 3, 5, 7 are pairwise coprime,  $LCM = 3 \times 5 \times 7 = 105$ .

Hence, **105**.

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42. Answer: d

**Explanation:**

Statement 1 gives 3-sided figures  $\subset$  triangles, but not the converse (triangles could have other properties).

So conclusion I ('all triangles have 3 sides') is not strictly derivable from the statements.

Conclusion II: if any circle had 3 sides, it would be a triangle by statement 1, but statement 2 says no triangle is a circle — contradiction.

So no circle has 3 sides.

II follows.

Hence, Only conclusion II follows.

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**43. Answer: b**

**Explanation:**

Conclusion 1 (ban ALL new vehicle registrations) is too extreme — new vehicles today typically meet stricter emission norms (BS-VI), so banning them wholesale is unjustified.

Conclusion 2 (ban 15+ year old vehicles) is a targeted, well-founded measure — old vehicles are the highest polluters and NGT has upheld such bans.

Hence, Only conclusion 2 follows.

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**44. Answer: a**

**Explanation:**

Litre is the unit of measurement for liquids (volume).

Analogously, kilogram is the unit of measurement for weight (mass).

The relationship is 'quantity : its measuring unit'.

Flower:Vase (container), Fame:Television (unrelated), Bushel:Corn (a bushel measures corn — order reversed).

Hence, **Weight : Kilogram**.

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**45. Answer: b**

**Explanation:**

A conductor is a material that allows electric current to flow easily due to low electrical resistance.

Examples include copper, silver, aluminium — used in wires and cables.

An insulator (like rubber, plastic) has very high resistance.

A resistor is a component designed to have specific resistance.

Hence, **Conductor**.

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**46. Answer: b**

**Explanation:**

In August 2018, Moody's Investors Service projected India's GDP growth at 7.5% for FY 2018-19, retaining its earlier forecast.

The projection reflected strong domestic consumption and investment activity, despite concerns about oil prices and currency depreciation.

Hence, **7.5%**.

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**47. Answer: d**

### Explanation:

The d-block elements (groups 3–12 in the periodic table) are called transition elements or transition metals.

They have partially filled d-orbitals and exhibit variable oxidation states, form coloured compounds, and act as good catalysts.

Alkaline earth metals are Group 2 (s-block), zero group/inert gases are Group 18 (p-block).

Hence, **Transition elements**.

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### 48. Answer: a

#### Explanation:

Apply BODMAS.

Inside absolute:  $21 \div (-7) = -3$ ;  $-3 + 12 = 9$ .  $|9| = 9$ .

Now  $9 \times 21 = 189$ ;  $189 + 5 = 194$ .

Hence, **194**.

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### 49. Answer: c

#### Explanation:

The most electronegative elements are the **halogens (Group 17)**. Among them, **fluorine** is the most electronegative element, with an electronegativity of **3.98** on the Pauling scale.

Halogens have the outer electronic configuration  **$ns^2np^5$** . They have 7 electrons in their valence shell and need only **one electron** to complete their octet.

Therefore, halogens have a strong tendency to gain an electron and show high electronegativity.

$ns^2np^6$  is the stable electronic configuration of noble gases.

Hence, the correct answer is:  $ns^2np^5$

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50. Answer: a

**Explanation:**

The sheet is folded along the **vertical dotted line**.

- When the sheet is folded, the right portion is reflected onto the left side.
- The **circle and the diagonal line** must appear as their mirror images with respect to the dotted line.
- The position of the circle remains on the corresponding side, while the **direction of the diagonal line is reversed**.
- Among the given options, only **Option B** shows the correct reflected pattern.

Hence, the correct answer is: (B)

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51. Answer: c

**Explanation:**

The sequence follows a rotational movement of the elements:

1. The arrow direction changes as left → down → right → up.
2. The black dot changes its position from bottom-right → top-right → bottom-left → top-left.
3. The inner L-shaped line also rotates accordingly.

Therefore, the next figure should have the arrow pointing upward and the black dot at the top-left.

This matches Option D.

Hence, the correct answer is: (D)

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**52. Answer: c**

**Explanation:**

The Government of Odisha received the 'Geospatial World Excellence Award-2018' in February 2018 for successfully implementing the Integrated Mines and Minerals Management System (I3 MS), a web-based software for real-time tracking of mineral production, dispatch and revenue collection.

The award recognises exemplary use of geospatial technology in governance.

Hence, **Odisha**.

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**53. Answer: c**

**Explanation:**

From Newton's law of gravitation  $F = G \cdot m_1 \cdot m_2 / r^2$ .

Rearranging:  $G = F \cdot r^2 / (m_1 \cdot m_2)$ .

Units:  $G = \text{N} \cdot \text{m}^2 / (\text{kg} \cdot \text{kg}) = \text{N} \cdot \text{m}^2 \cdot \text{kg}^{-2}$ .

Numerical value  $G \approx 6.674 \times 10^{-11} \text{ N} \cdot \text{m}^2 / \text{kg}^2$ .

Hence,  $\text{Nm}^2\text{Kg}^{-2}$ .

54. Answer: c

**Explanation:**

'Googly' is a bowling delivery in cricket by a leg-spin bowler that spins in the opposite direction to a normal leg-break, deceiving the batsman.

It was invented by English cricketer Bernard Bosanquet in the early 1900s and is also called a 'wrong'un' or 'bosie'.

Master leg-spinners like Shane Warne, Anil Kumble and Yasir Shah famously used it.

Hence, **Cricket**.

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55. Answer: c

**Explanation:**

NITI Aayog (National Institution for Transforming India) was established on 1 January 2015, replacing the Planning Commission (established in 1950).

Unlike the Planning Commission that followed top-down planning, NITI Aayog acts as a think tank promoting cooperative federalism and bottom-up planning.

The Prime Minister chairs it.

Hence, **the Planning Commission**.

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56. Answer: d

**Explanation:**

Let a = exactly one, x = exactly two, y = exactly three = 20. 'At least two' =  $x + y = 30$ , so  $x = 10$ .

Total 'like counts' =  $a + 2x + 3y$  = sum of individual counts =  $45 + 60 + 40 = 145$ .

So  $a + 2 \times 10 + 3 \times 20 = 145 \rightarrow a = 145 - 80 = 65$ .

Hence, **65**.

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**57. Answer: c**

**Explanation:**

The code uses reverse alphabet mapping ( $A \leftrightarrow Z$ ,  $B \leftrightarrow Y$ ,  $C \leftrightarrow X$ , ..., i.e., each letter  $\rightarrow$  the letter at position  $27-n$ ).

Check CARRY:  $C(3) \rightarrow X(24)$ ,  $A(1) \rightarrow Z(26)$ ,  $R(18) \rightarrow I(9)$ ,  $R \rightarrow I$ ,  $Y(25) \rightarrow B(2)$ .  $\checkmark$  For BRING:  $B(2) \rightarrow Y(25)$ ,  $R(18) \rightarrow I(9)$ ,  $I(9) \rightarrow R(18)$ ,  $N(14) \rightarrow M(13)$ ,  $G(7) \rightarrow T(20) \rightarrow YIRMT$ .

Hence, **YIRMT**.

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**58. Answer: b**

**Explanation:**

Electric current is the flow of electric charge, and in most conductors (metals, semiconductors), this flow consists of moving electrons — negatively charged particles that orbit atomic nuclei.

Protons and neutrons are held in the atomic nucleus and don't flow in typical conductors.

Positrons are the antiparticles of electrons and are rare.

Hence, **Electron**.

59. Answer: d

**Explanation:**

The Gautam Buddha Wildlife Sanctuary referenced here is located in the Chatra district of Jharkhand, spread over the forest area of the Chota Nagpur Plateau.

It is home to species like leopard, sloth bear, wolf and various deer species.

(A separate sanctuary of similar name in Bihar's Gaya district also exists; the RRB source lists Jharkhand.) Hence the correct answer per the source key is Jharkhand.

Hence, **Jharkhand**.

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60. Answer: a

**Explanation:**

Fermentation is the slow chemical breakdown of an organic substance (like sugars) by the action of microorganisms/enzymes to produce simpler molecules like alcohol, CO<sub>2</sub> or acids.

Examples: yeast fermenting glucose to ethanol and CO<sub>2</sub> ( $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$ ).

Homologous series and isomers are chemistry classifications, not processes.

Hence, **Fermentation**.

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61. Answer: a

**Explanation:**

Solution:

Using the property of **alternate angles**, the angle of elevation from the foot of the building to the top of the tower is also  $30^\circ$ .

Let the height of the tower be  $h$  and the horizontal distance be  $36$  m.

$$\tan 30^\circ = \frac{h}{36}$$

Therefore,

$$\begin{aligned} h &= 36 \times \tan 30^\circ \\ &= 36 \times \frac{1}{\sqrt{3}} = \frac{36}{\sqrt{3}} = 12\sqrt{3} \text{ m} \end{aligned}$$

Hence, the height of the tower =  $12\sqrt{3}$  m.

62. Answer: c

Explanation:

By the tangent-secant relation from an external point D:  $DE^2 = DB \times DA$ .

Here  $DA = DB + AB = DB + 10$ .

So  $12^2 = DB(DB + 10) \rightarrow 144 = DB^2 + 10 \cdot DB \rightarrow DB^2 + 10 \cdot DB - 144 = 0$ .

Solve:  $DB = \frac{-10 + \sqrt{(100 + 576)}}{2} = \frac{-10 + 26}{2} = 8$ .

Hence, 8 cm.

63. Answer: c

Explanation:

Sound in humans is produced by the vibration of the vocal cords (vocal folds) located in the larynx (voice box).

When air from the lungs passes through the glottis, the vocal cords vibrate, producing sound waves.

Tension and length of the vocal cords determine pitch, while the mouth cavity and pharynx act as resonators.

Hence, **vocal cords**.

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**64. Answer: c**

**Explanation:**

The mirror MN is vertical, so the figure undergoes a left-right reversal, while its top and bottom positions remain unchanged.

- The slanting portion and angular part on the right side of the original figure appear on the left side in the mirror image.
- All the lines are laterally reversed with respect to the vertical mirror.
- Among the given options, Option A shows the correct mirror image.

Hence, the correct answer is: (A)

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**65. Answer: c**

**Explanation:**

In a Venn diagram, the overlapping region between two sets represents elements belonging to both.

The intersection of 'government employees' and 'private workers' circles is the shared region.

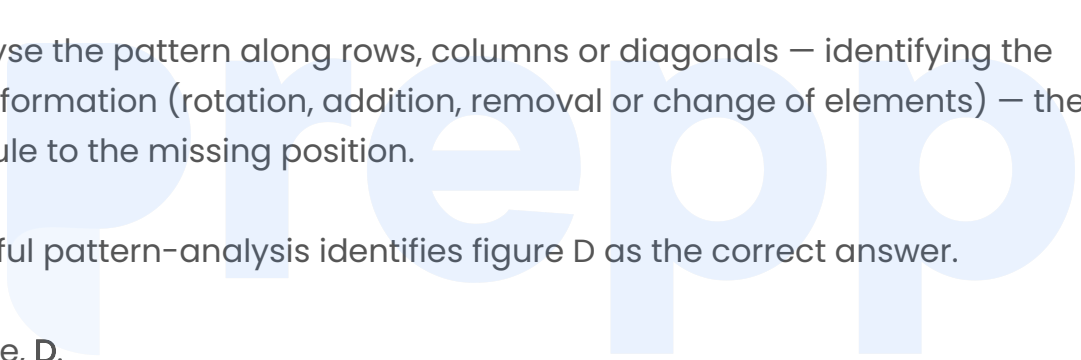
Identifying this intersection region in the diagram and matching with the labelled letters points to n as the correct label.

Hence, m.

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**66. Answer: c**

**Explanation:**

The question presents a matrix or sequence of figures with one position marked '?'.  


Analyse the pattern along rows, columns or diagonals — identifying the transformation (rotation, addition, removal or change of elements) — then apply the rule to the missing position.

Careful pattern-analysis identifies figure D as the correct answer.

Hence, D.

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**67. Answer: c**

**Explanation:**

Moles = mass  $\div$  molar mass.

Molar mass of  $O_2$  = 32 g/mol.

Moles in 12 g of  $O_2$  =  $12 \div 32 = 0.375$ .

(If the reference is atomic oxygen O with molar mass 16 g/mol, moles =  $12/16 = 0.75$ .)

Per the RRB source key, the answer is 0.375.

Hence, 0.375.

68. Answer: b

**Explanation:**

Test each option using BODMAS.

Option 1 (+, ×, +):  $8 + 10 \times 20 + 6 = 8 + 200 + 6 = 214 \neq 11$ .

Option 2 (+, ÷, ×):  $8 + 10 \div 20 \times 6 = 8 + 0.5 \times 6 = 8 + 3 = 11 \checkmark$ .

Option 3 (+, +, ×):  $8 + 10 + 120 = 138 \neq 11$ .

Option 4 (÷, -, ×):  $0.8 - 120 = -119.2 \neq 11$ .

Hence, +, ÷, ×.

---

69. Answer: c

**Explanation:**

Combined filling rate =  $\frac{1}{6} + \frac{1}{3} - \frac{1}{5}$ .

LCM 30:  $\frac{5}{30} + \frac{10}{30} - \frac{6}{30} = \frac{9}{30} = \frac{3}{10}$  of tank per hour.

Therefore time to fill =  $\frac{30}{9} = \frac{10}{3}$  hours (about 3.33 hrs).

The options list  $\frac{3}{10}$  hours (rate) rather than  $\frac{10}{3}$  hours (time), causing the discrepancy — the RRB officially ignored this question for all candidates.

Per source, option 3 ( $\frac{3}{10}$ ) is marked.

Hence,  $\frac{3}{10}$  hrs.

---

70. Answer: c

### Explanation:

The problem shows a larger figure with a missing piece; the correct option is the shape that seamlessly fits into the blank space matching contours and orientation.

Careful comparison of shape edges and pattern continuity picks option B as the correct fit.

Hence, B.

---

### 71. Answer: d

#### Explanation:

A speedometer measures the instantaneous speed of a vehicle — the speed at a specific moment in time — as opposed to average speed which is total distance divided by total time.

Instantaneous speed reflects the current motion using rotation of wheels/drive shaft.

Maximum speed is the highest possible, not what a moving speedometer shows.

Hence, instantaneous.

---

### 72. Answer: c

#### Explanation:

For money to double, simple interest = principal.

$$SI = P \cdot R \cdot T / 100 = P \rightarrow R \cdot T = 100 \rightarrow T = 100 / R = 100 / 10 = 10 \text{ years.}$$

Alternatively, at 10% per year the interest per year is 10% of P; to accumulate 100% (i.e., double), 10 years are needed.

Hence, 10 years.

---

73. Answer: a

**Explanation:**

Pandit Vishwa Mohan Bhatt is renowned for playing the Mohan Veena, a modified slide guitar of his own design.

He won the Grammy Award in 1994 in the Best World Music category for 'A Meeting by the River' with Ry Cooder.

He is a padma-awardee disciple of Pandit Ravi Shankar.

Hence, Slide guitarist.

---

74. Answer: b

**Explanation:**

The tricuspid valve (त्रिकुपदी) is located between the right atrium and right ventricle.

It has three cusps/leaflets that prevent backflow of blood from the ventricle into the atrium during ventricular contraction.

The bicuspid (mitral) valve, with two cusps, lies between the left atrium and left ventricle.

Pulmonary valve is between the right ventricle and pulmonary artery.

Hence, Tricuspid valve.

---

75. Answer: c

**Explanation:**

By alternate angles, the angle of elevation from the building's base to the tower top =  $60^\circ$ .

Let  $d$  = horizontal distance.  $\tan 60^\circ = \text{height}/d \rightarrow \sqrt{3} = 88\sqrt{3}/d \rightarrow d = 88\sqrt{3}/\sqrt{3} = 88$  m.

Hence, 88 m.

---

**76. Answer: d****Explanation:**

Central angle of a sector in a pie chart =  $(\text{percentage share}/100) \times 360^\circ$ .

If the promotion cost sector corresponds to 10% of expenses, its central angle =  $10/100 \times 360^\circ = 36^\circ$ .

The pie chart's promotion slice is thus  $36^\circ$ .

Hence,  $36^\circ$ .

---

**77. Answer: d****Explanation:**

Take clockwise as positive.

Start bearing: East =  $90^\circ$ .

After  $+45^\circ$  (CW):  $135^\circ$  (SE).

After  $-135^\circ$  (ACW):  $0^\circ$  (North).

After  $+90^\circ$  (CW):  $90^\circ$  (East).

Final direction is East.

Hence, **East**.

---

**78. Answer: a**

**Explanation:**

International Jazz Day is celebrated on 30 April every year.

It was declared by UNESCO in November 2011 and first observed in 2012.

The day highlights jazz music's role in uniting people and promoting peace and dialogue.

Hence, **30 April**.

---

**79. Answer: c**

**Explanation:**

Apply BODMAS inside brackets:  $7 \times 3 = 21$ ;  $24 \div 8 = 3$ , then  $3 \times 3 = 9$ ;  $4 \times 2 = 8$ .

Bracket =  $21 + 9 - 8 = 22$ .

Full expression:  $40 - 22 + 12 = 30$ .

Hence, **30**.

---

**80. Answer: c**

### Explanation:

The tradition of awarding gold, silver, and bronze medals to the first, second and third place winners was introduced at the 1904 Summer Olympics in St.

Louis, USA.

Before that, winners received other awards (silver medals and olive wreaths at Athens 1896; gold-coloured or silver-gilt at Paris 1900).

Hence, **1904**.

---

### 81. Answer: c

#### Explanation:

Assumption I ('best in India') is too strong — the statement only recommends Manisha as an expert, not as the best in India.

Assumption II ('no other trainer exists') is also too extreme — recommendation doesn't imply exclusivity.

Neither assumption is implicit in the statement.

Hence, **Neither I nor II is implicit**.

---

### 82. Answer: d

#### Explanation:

Argument I is weak — the warning does not necessarily 'take the idea of watching' out of one's mind; viewers continue watching.

Argument II is also weak — a small textual warning is a mild disturbance and is a public health measure that outweighs viewer convenience.

Neither argument is compelling on either side.

Hence, **Neither I nor II is strong.**

---

**83. Answer: a**

**Explanation:**

Sexual reproduction combines genetic material from two parents through processes like meiosis, crossing over and independent assortment, producing offspring with unique gene combinations.

This creates greater genetic diversity in the population, which is essential for evolution and adaptation.

Asexual reproduction, tissue culture and vegetative growth produce genetic clones.

Hence, **Sexual reproduction.**

---

**84. Answer: a**

**Explanation:**

Washing soda has the chemical formula  $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$  — sodium carbonate decahydrate.

It contains 10 water molecules of crystallisation per formula unit.

On heating, it loses water becoming  $\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}$  (soda ash monohydrate) and finally anhydrous  $\text{Na}_2\text{CO}_3$ .

It is widely used in laundry, glass-making and water-softening.

Hence, **10.**

---

85. Answer: a

**Explanation:**

Work done by gravity when a body falls through height  $h$  is  $W = mgh$ .

Here  $m = 10 \text{ kg}$ ,  $g = 10 \text{ m/s}^2$ ,  $h = 4 \text{ m}$ .

So  $W = 10 \times 10 \times 4 = 400 \text{ J}$ .

Force is in the same direction as displacement, so work is positive.

Hence, 400 J.

86. Answer: d

**Explanation:**

$m$  men  $\times$   $p$  days do  $1/n$  work.

Total work in man-days =  $m \cdot p$  to do  $1/n \rightarrow$  whole work needs  $m \cdot p \cdot n$  man-days.

If  $x$  men do it in  $q$  days, then  $x \cdot q = m \cdot p \cdot n \rightarrow x = mnp/q$ .

Hence,  $mnp/q$ .

87. Answer: d

**Explanation:**

Mass = moles  $\times$  molar mass.

Molar mass of hydrogen atom (H) =  $1 \text{ g/mol}$ .

So mass =  $0.6 \times 1 = 0.6 \text{ g}$ .

If the question referred to  $H_2$  molecules ( $M = 2$ ), it would be 1.2 g — but for hydrogen atoms, the answer is 0.6 g.

Hence, 0.6 g.

---

**88. Answer: b**

**Explanation:**

The sequence is based on the **combination and transformation of the given shapes**.

- The **first figure** is a four-sided shape.
- The **second figure** shows a combination/inversion of similar shapes.
- The **third figure** is a triangle.
- Continuing the same pattern, the next figure is formed by joining **two triangles along their bases**, producing a **diamond-shaped figure with a horizontal line through the middle**.

This matches Option 2 (B).

Hence, the correct answer is: (B)

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**89. Answer: a**

**Explanation:**

The problem presents a series of figures with a specific pattern (containing symbols/shapes changing progressively).

Identify the rule by comparing adjacent figures and apply it to find the missing figure.

Careful visual analysis identifies option C as the correct completion.

Hence, C.

---

90. Answer: b

**Explanation:**

Frequency = number of waves per second =  $600/60 = 10$  Hz.

Using  $v = f \cdot \lambda$  (wave equation):  $600 = 10 \times \lambda \rightarrow \lambda = 60$  m.

Hence, 60 m.

---

91. Answer: c

**Explanation:**

Madhubani (also called Mithila) painting is a traditional folk art of the Mithila region in Bihar and adjoining parts of Nepal.

Practiced mainly by women, it uses natural dyes and pigments and features geometric patterns, deities, flora and fauna.

It received a GI tag and is a UNESCO-recognised art form.

Hence, Bihar.

---

92. Answer: c

**Explanation:**

Initial =  $18 \frac{2}{7} = \frac{128}{7}$  L.

$$\text{Final} = 6 \frac{6}{7} = \frac{48}{7} \text{ L.}$$

$$\text{Used} = \frac{128}{7} - \frac{48}{7} = \frac{80}{7} \text{ L.}$$

$$\text{Fraction used} = \left(\frac{80}{7}\right) \div \left(\frac{128}{7}\right) = \frac{80}{128} = \frac{5}{8}.$$

Hence,  $\frac{5}{8}$ .

---

**93. Answer: b**

**Explanation:**

18th letter from the left in A–Z is R (A=1, B=2, ..., R=18).

6th letter to the right of R is R + 6 positions = 24th letter = X.

Hence, X.

---

**94. Answer: a**

**Explanation:**

For large heights, use conservation of energy with variable gravity.

$$\left(\frac{1}{2}\right)mv^2 = GMm\left(\frac{1}{R} - \frac{1}{(R+h)}\right) = mgR \cdot h / (R+h) \text{ (since } GM = gR^2\text{)}.$$

$$\text{So } v^2 = 2gR \cdot h / (R+h).$$

$$\text{Given } v^2 = 1.6gR: 1.6gR = 2gR \cdot h / (R+h) \rightarrow 1.6(R+h) = 2h \rightarrow 1.6R + 1.6h = 2h \rightarrow 0.4h = 1.6R \rightarrow h = 4R.$$

Hence,  $4R$ .

---

**95. Answer: b**

### Explanation:

Inder Kumar Gujral served as the 12th Prime Minister of India from 21 April 1997 to 19 March 1998.

He was known for the 'Gujral Doctrine' emphasising good relations with India's neighbours.

Deve Gowda was the 11th PM (1996–97), P.

V.

Narasimha Rao the 10th PM (1991–96), and Vajpayee the 10th & 13th PM.

Hence, Inder Kumar Gujral.

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### 96. Answer: a

### Explanation:

Each letter is shifted +5 positions.

Check PEARL:  $P \rightarrow U$  ( $P+5$ ),  $E \rightarrow J$  ( $E+5$ ),  $A \rightarrow F$  ( $A+5$ ),  $R \rightarrow W$  ( $R+5$ ),  $L \rightarrow Q$  ( $L+5$ ). ✓ Apply to PIANO:  $P \rightarrow U$ ,  $I \rightarrow N$ ,  $A \rightarrow F$ ,  $N \rightarrow S$ ,  $O \rightarrow T \rightarrow UNFST$ .

Hence, UNFST.

---

### 97. Answer: b

### Explanation:

Algae are classified under the plant division Thallophyta, characterised by an undifferentiated plant body called thallus (no true roots, stems, or leaves).

They are mostly aquatic and photosynthetic.

Bryophyta (mosses, liverworts) are non-vascular land plants, Pteridophyta (ferns) are vascular seedless plants, and Gymnosperms bear naked seeds.

Hence, **Thallophyta**.

**98. Answer: b**

**Explanation:**

For two people starting simultaneously toward each other and meeting:  
 $\text{speed}_1 / \text{speed}_2 = \sqrt{(t_2/t_1)}$ , where  $t_1$  = time  $\text{speed}_1$ 's person takes after meeting,  $t_2$  = time  $\text{speed}_2$ 's person takes after meeting.

Here Parvez speed = 40, remaining time 16 h; Gautam speed =  $g$ , remaining time 4 h.

So  $40/g = \sqrt{(4/16)} = 1/2 \rightarrow g = 80 \text{ km/hr.}$

Hence, **80**.

**99. Answer: b**

**Explanation:**

For projectile motion:

$$R = \frac{u^2 \sin(2\theta)}{g}$$

and

$$H = \frac{u^2 \sin^2 \theta}{2g}$$

Given  $R = H$ :

$$\frac{u^2 \sin(2\theta)}{g} = \frac{u^2 \sin^2 \theta}{2g}$$

$$2 \sin(2\theta) = \sin^2 \theta$$

$$2(2 \sin \theta \cos \theta) = \sin^2 \theta$$

$$4 \cos \theta = \sin \theta$$

$$\tan \theta = 4$$

Therefore,

$$\theta = \tan^{-1}(4)$$

Hence, the answer is  $\tan^{-1}(4)$ .

100. Answer: a

**Explanation:**

Count the triangles systematically in the given figure, including small individual triangles and larger triangles formed by combining smaller ones.

Adding all such triangles at each size level gives a total of 12 triangles.

Hence, 12.