Prepp.in

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Your Personal Exams Guide

- NDA
- CDS
- SSC CGL
- CBSE UGC NET
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- CSIR UDC NET
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- RRB NTPC
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- RBI GRADE B
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- DSSSB

RRB Group D 2018 Prev. Yr. Paper (31 Oct 2018) (Shift 2)

Total Time: 1 Hour : 30 Minute **Total Marks:** 100

Instructions

Sl No.	Section Name	No. of Question	Maximum Marks	Negative Marks	Positive Marks
1	CBT	100	100	0.33	1

1.) A total of 90 minutes is allotted for the examination.

2.) The server will set your clock for you. In the top right corner of your screen, a countdown timer will display the remaining time for you to complete the exam. Once the timer reaches zero, the examination will end automatically. The paper need not be submitted when your timer reaches zero.

3.) There will, however, be sectional timing for this exam. You will have to complete each section within the specified time limit. Before moving on to the next section, you must complete the current one within the time limits.

CBT

1. Who is the 35th Governor of Bihar? **(+1, -0.33)**

   a. D. Y. Patil

   b. Ram Nath Kovind

   c. Devanand Konwar

   d. Satya Pal Malik

---

2. The first Indian state to launch Single Women Pension Scheme is _____. **(+1, -0.33)**

   a. Maharashtra

   b. Gujrat

   c. Delhi

   d. Telangana

---

3. 'Bandodkar Gold Trophy' is associated with _____ sport. **(+1, -0.33)**

   a. Football

   b. Tennis

   c. Golf

   d. Kho-Kho

---

4. The Minister of Higher and Technical Education for the state of Maharashtra is _____. (+1, -0.33)

a. Vinod Tawdean

b. Chandrakant Patil

c. Prakash Mehta

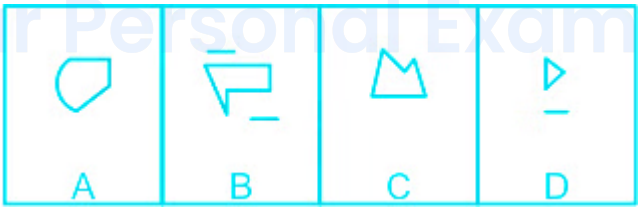
d. Pankaja Munde

---

5. One of the answer figures is embedded in the given question figure. Identify this figure- (+1, -0.33)

Question figure:

Answer figure:



a. D

b. C

c. B

d. A

---

6. Alkenes, unsaturated hydrocarbons containing a double bond between two carbon atoms, have a general formula, which is: **(+1, -0.33)**

a. C_nH_{2n+2}

b. C_nH_{2n-1}

c. C_nH_{2n+1}

d. C_nH_{2n}

7. **(+1, -0.33)**

The above group has a similar figure:

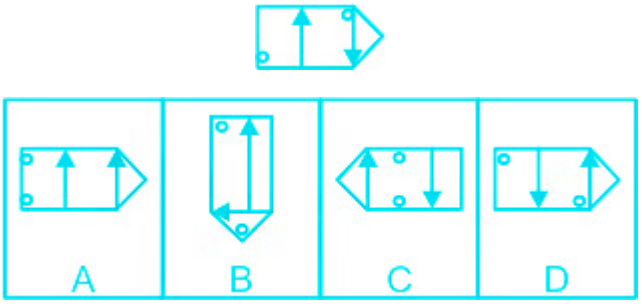
a. 1, 2, 5 ; 8, 6, 4 ; 2, 7, 9

b. 1, 3, 2 ; 5, 6, 4 ; 8, 7, 9

c. 1, 2, 8 ; 5, 6, 3 ; 4, 7, 9

d. 1, 2, 3 ; 5, 6, 8 ; 4, 7, 9

8. Which option has the closest resemblance to the following figure? **(+1, -0.33)**



a. A

b. D

c. B

d. C

9. _____ who took over as the Governor-General in 1848 formulated a policy called 'Doctrine of Lapse'. **(+1, -0.33)**

a. Lord Wellesley

b. Lord William

c. Lord cornwallis

d. Lord Dalhousie

10. Find the next number in the sequence- **(+1, -0.33)**

110, 89, 70, 53, 38, ?

a. 20

b. 34

c. 28

d. 25

---

11. A tank can be filled by two taps A and B in 8 hours and 10 hours respectively. The whole tank can be emptied by the third tap in 12 hours. If all the taps are turned on at the same time, in how much time (in how many hours) will the empty tank be completely filled? **(+1, -0.33)**

a. 9

b. 10

c. 8

d. 7

---

12. Read the given statement and choose the strong argument- **(+1, -0.33)**

Question:

Should the government stop allowing new industries to be set up?

Argument:

I. Yes, new industries generate environmental pollution.

II. No, new industries will improve employment and help in the economic development of the country.

a. Neither argument I nor argument II is strong

b. Only Argument II is strong

c. Only argument I is strong

d. Either Argument I or Argument II is strong

---

13. A vendor sells scented candles in three fragrances. 20 customers bought rose scent, 40 bought cinnamon scent and 30 bought lemongrass scent. 6 bought all three fragrances. 20 bought two of these fragrances. How many bought only one fragrance? **(+1, -0.33)**

a. 34

b. 43

c. 42

d. 44

---

14. What is the square root of $(x^2 + 4x + 4)(x^2 + 6x + 9)$? **(+1, -0.33)**

a. $(2x + 3)(x + 3)$

b. $(x + 2)(x + 3)$

c. $(x + 2)(2x + 3)$

d. $(x + 2)(x + 4)$

---

15. Which film has won the Global Sustainability Film Award for India in London, 2017? **(+1, -0.33)**

a. Lipstick under my burqa

b. Neerja

c. Pink

d. Queen

---

16. In a company, 12 workers can make 111 candles in a given time. How many people will have to be engaged to make 148 candles in the same time? **(+1, -0.33)**

a. 18 people

b. 12 people

c. 16 people

d. 10 people

---

17. Acceleration due to gravity g = _____ **(+1, -0.33)**

a. GMR^2

b. MR^2/G

c. G/MR^2

d. GM/R^2

---

18. The wall of the ventricle is _____ from the wall of the atrium. **(+1, -0.33)**

a. Thick

b. Small

c. Thin

d. Big

19. In which of the following will the speed of sound be maximum at 25°C? **(+1, -0.33)**

a. Brass

b. Steel

c. Aluminum

d. Iron

20. The lengths of the three sides of a triangle are given as 6 cm, 11 cm and 13 cm. The ratio of their respective heights from the opposite vertex will be: **(+1, -0.33)**

a. 13 : 11 : 6

b. 24 : 19 : 17

c. 143 : 78 : 66

d. 66 : 143 : 78

21. $\sqrt{\frac{?}{3136}} = \frac{1}{2}$ Find the value of the question mark- **(+1, -0.33)**

a. 56

b. 784

c. 1568

d. 28

22. The frequency distribution of diameter (D) of 101 steel balls is given in the following list- **(+1, -0.33)**

D(mm)	43	44	45	46	47	48
No.	13	15	22	21	16	14

find the mean of the diameter in mm

a. 45.4

b. 45.5

c. 45.7

d. 45.6

---

23. If the potential difference across the terminals of an electric heater is 60V when it receives a current of 4A from the source. If the potential difference increases to 150V, what will be the current received by the heater? **(+1, -0.33)**

a. 24A

b. 8.5A

c. 10A

d. 12A

---

24. Evaluate- **(+1, -0.33)**

$36 \div \frac{1}{4}$

a. Inversely proportional to [9]

b. 144

c. Inversely proportional to [144]

d. 9

---

25. Calculate the energy of an object of mass 10 kg placed at a height of 6 m above the ground. Given, g = 9.8 ms^{-2} **(+1, -0.33)**

a. 578 J

b. 588 J

c. 578 W

d. 588 W

---

26. In a code language, LIVE is written as OREV. What is the code for DEAD? **(+1, -0.33)**

a. XVZX

b. UVZU

c. GVZG

d. WVZW

---

27. Who is the Union Minister of Environment and Climate Change (as of July 2018)? **(+1, -0.33)**

a. Rajnath Singh

b. Dr. Harsh Vardhan

c. Prakash Javadekar

d. V.K. Singh

---

28. The area of the circumscribed circle of a right-angled triangle with sides 8 cm, $4\sqrt{5}\,\text{cm}$ and 12 cm will be _____. **(+1, -0.33)**

a. 27 πcm^2

b. 36 πcm^2

c. 18 πcm^2

d. 9 πcm^2

---

29. Which of the following are examples of potential energy? **(+1, -0.33)**

A. A brick placed on the roof of the house

B. When the spring of a clock rotates

C. Compressed Spring

D. water stored in a high reservoir underwater supply system

a. A, D

b. C, D

c. A, B and C

d. A, B, C, D

---

30. In each of the questions below is given a statement followed by two assumptions numbered I and II. You have to consider the statement and the following assumptions and decide which of the assumptions are implicit in the statement. **(+1, -0.33)**

Statements: Everyone loves Indian clothes.

Assumptions:

I. Indian clothes are the only clothes available.

II. No one loves any other clothes .

a. Only assumption I is implicit

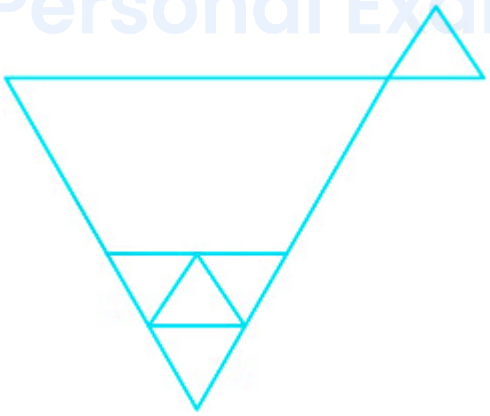
b. Neither I nor II is implicit

c. Only Assumption II is implicit

d. Both I and II are implicit

---

31. State the number of triangles included in the figure: **(+1, -0.33)**



a. 6

b. 8

c. 7

d. 5

---

32. Which of the following is not true about acids? (+1, -0.33)

a. Conductors of electricity in aqueous mediuid stateum/liq

b. Forms H+ in aqueous medium/liquid state

c. Reacts with metals and bicarbonates to produce H_2O, CO_2 and salts
×
duplicate options found. English Question 1 options 1,2

d. Sour in taste

---

33. Sandhya and Ramani were facing east. Sandhya rotates 45° anti-clockwise and then 135° clockwise. How much will Ramani have to rotate to face Sandhya? (+1, -0.33)

a. 180° anti-clockwise

b. 180° clockwise

c. 135° anti-clockwise

d. 90° anti-clockwise

---

34. In _____ tissue, the cells are living, long and irregularly thickened at the ends. (+1, -0.33)

a. sclerenchyma

b. Iron chyma

c. Collenchyma

d. Parenchyma

---

35. In a class of students, the ratio of boys and girls is 7 : 3. The average marks of boys is 65 and that of girls is 72. What are the average marks of the whole class? **(+1, -0.33)**

a. 67.1

b. 68.4

c. 68.3

d. 68.2

---

36. How many atoms are present in a molecule of $Ca(OH)_2$? **(+1, -0.33)**

a. 7

b. 4

c. 5

d. 6

---

37. In the options given below, three words are similar in some context and one word is different. Choose the word that is different from the rest. **(+1, -0.33)**

a. Plastic

b. Wood

c. Paper

d. Wool

---

38. Which political party does PuZoramthangalead? **(+1, -0.33)**

a. National People's Party

b. Naga People's Front

c. Mizoram People's Conference

d. Mizo National Front

---

39. Select the option which is related to the third term in the same way as the second term is related to the first term. **(+1, -0.33)**

Hot : Warm :: Antique : _____?

a. Old

b. Oldest

c. Years

d. History

---

40. The speed of the boy sitting on the swing is _____. **(+1, -0.33)**

a. Uniform

b. Circular

c. Unequal

d. Oscillatory

---

41. Last year Manish, Corner had invested ₹ 1,00,000 on shop 1 and ₹ 1,50,000 on shop 2 for the furniture replacement. They recovered expenses over the next three quarters: Quarter 1 -20%, Quarter 2-55%. What was the amount (in Rs.) received in Quarter 3? **(+1, -0.33)**

a. 60,500

b. 62,500

c. 62,600

d. 70,000

---

42. Read the given question and decide which of the following statement(s) is/are sufficient to answer the question. **(+1, -0.33)**

Question:

Which rod is longest among T1, T2, and T3?

Statement:

1. T2 and T1 are longer than T3.

2. T2 is an iron rod.

a. Only Statement 1 is sufficient

b. Statements 1 and 2 both are not sufficient

c. Statements 1 and 2 both are sufficient

d. Statement 2 alone is sufficient

---

43. A father says to his son, "I was equal to your present age at the time of your birth." If the present age of the father is 40 years, then what was the age of his son 5 years ago? **(+1, -0.33)**

a. 15 years

b. 13 years

c. 17 years

d. 23 years

---

44. As of August 2018, who is the current Chairman and Managing Director of Air India? **(+1, -0.33)**

a. Ajay Singh

b. Pradeep Singh Kharola

c. Aditya Ghosh

d. Kalanithi Maran

---

45. 36% of 325 is- **(+1, -0.33)**

a. 144

b. 108

c. 128

d. 117

---

46. At an instant, the acceleration of a rocket is proportional to the n th power of the velocity of exhaust gases. What should be the value of n here? **(+1, -0.33)**

a. 1

b. 2

c. -1

d. -2

---

47. _____ is a religious city located in the Indian state of Maharashtra. **(+1, -0.33)**

a. Shirdi

b. Rajgir

c. Somnath

d. Kushinagar

---

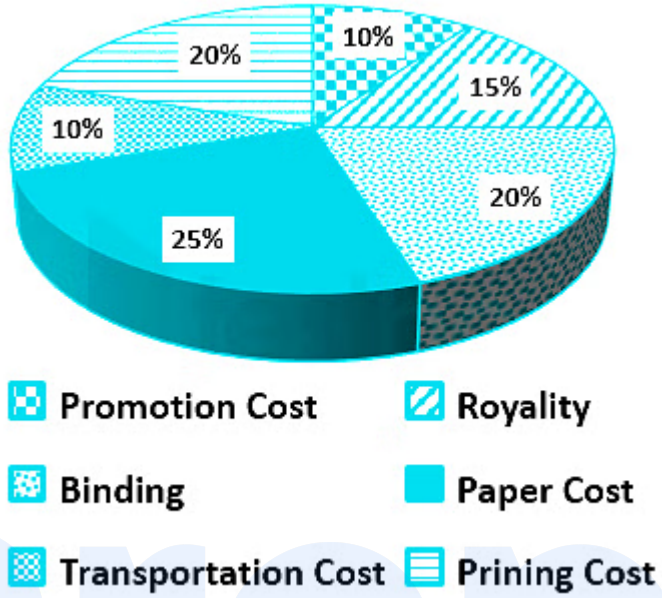
48. Count the number of triangles in the given figure- **(+1, -0.33)**

a. 9

b. 11

c. 10

d. 6



49. (+1, -0.33)

The given chart shows the expenses of a publishing company in Karnataka. If the total expenditure is Rs. 50,000, what is the binding cost?

a. 12,500

b. 10,000

c. 7,500

d. 5,000

---

50. If $\sqrt{50} + \sqrt{128} = \sqrt{N}$ then find the value of N. (+1, -0.33)

a. 26

b. 390

c. 338

d. 182

51. In which of the following classes, animals lack scales and have mucous glands in the skin? **(+1, -0.33)**

a. Reptiles

b. Fish

c. Amphibian

d. Aves

---

52. The cost price of two articles is Rs. 200 and Rs. 600. A shopkeeper makes a profit of Rs.300 by selling both. If the shopkeeper sold the first article at 30% profit, then at what profit does he sell the second article? **(+1, -0.33)**

a. 50%

b. 30%

c. 20%

d. 40%

---

53. Where is Manjira Crocodile Wildlife Sanctuary situated? **(+1, -0.33)**

a. Tamil Nadu

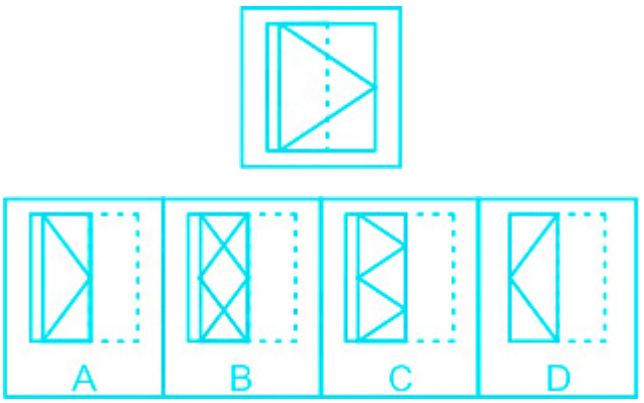
b. Odisha

c. Telangana

d. Kerala

---

54. When it is folded on the dotted line, which pattern will be the same as that of the transparent sheet? **(+1, -0.33)**



a. B

b. C

c. A

d. D

---

55. Select the alternative which has the same relation with the third word as the second word is with the first word. **(+1, -0.33)**

Enough : Contentment :: Feel : ?

a. Sense

b. React

c. Act

d. Leave

---

56. Niccolò Conti visited Vijayanagara in _____ AD during the reign of Devaraya I (+1, -0.33)

a. 1420

b. 1424

c. 1418

d. 1419

---

57. Which of the following is used as Antacid? (+1, -0.33)

a. Sodium Hydroxide

b. Magnesium Hydroxide

c. Aluminium Hydroxide

d. Lithium Hydoxide

---

58. _____ causes the changes in the appearance seen in boys at the time of puberty. (+1, -0.33)

a. Prolactin

b. Adrenaline

c. Estrogen

d. Testosterone

---

59. The SI unit of resistance is- (+1, -0.33)

a. Ampere

b. Coulomb

c. Volt

d. Ohm

---

60. How many moles are present in 54g of He? **(+1, -0.33)**

a. 13.5 Mole

b. 10 Mole

c. 12 Mole

d. 25 Mole

---

61. What is the amount of work done when an object is moved under a force of 10 N over a distance of 10 m in the direction of the force? **(+1, -0.33)**

a. 1 J

b. 10 J

c. 100 J

d. 0.01 J

---

62. What is the share of Government of India in NABARD? **(+1, -0.33)**

a. 75%

b. 50%

c. 99%

d. 85%

---

63. A train overtakes two persons, who are traveling in the same direction as the train moving at 2 km/h and 4 km/h and passes them in 9 and 10 seconds respectively. Find the length and speed of the train- **(+1, -0.33)**

a. 22 km/h, 50 m

b. 22 km/h, 80 m

c. 32 km/h, 50 m

d. 32 km/h, 80 m

---

64. Read the given statements and conclusions carefully and choose which of the statements logically follows from the conclusions. **(+1, -0.33)**

Statement:

There is rampant copying in colleges in some states which represents the poor quality of students in higher education.

Conclusion:

1. Malpractices like copying affect the quality of students in higher education.

2. Students from such colleges might also opt for higher education.

a. Only conclusion 1 follows

b. Either 1 or 2 follows

c. Both 1 and 2 follow

d. Only conclusion 2 follows

---

65. Divide Rs. 6,600 into two parts such that the simple interest on the first part at 10% per annum for 3 years is equal to the simple interest on the second part at 9% per annum for 4 years. **(+1, -0.33)**

a. Rs. 3600, 3000

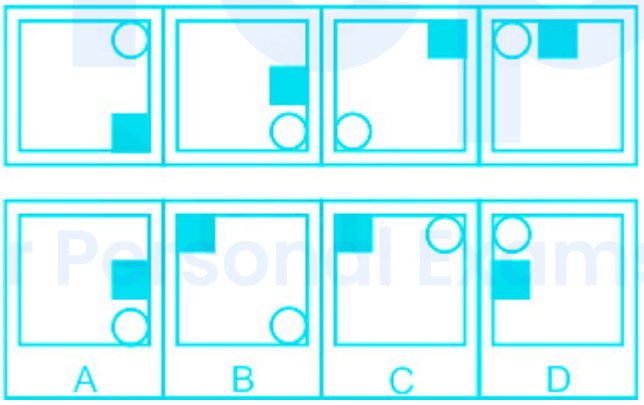
b. Rs. 4000, 2600

c. Rs. 5000, 1600

d. Rs. 6000, 600

---

66. Select the correct picture that comes from the given series of 4 pictures- **(+1, -0.33)**



a. C

b. A

c. D

d. B

---

67. The first football club in the world, which was established in England in 1857, was- (+1, -0.33)

a. Huddersfield Football Club

b. Manchester United Football

c. Chelsea Football Club

d. Sheffield Football Club

---

68. The boiling point of ethanol is- (+1, -0.33)

a. 108°C

b. 58°C

c. 98°C

d. 78°C

---

69. The L.C.M. and H.C.F. of two numbers are 68 and 5 respectively. If one of the numbers is 20, then find the other number? (+1, -0.33)

a. 15

b. 19

c. 14

d. 17

---

70. When is the National Army Day observed in India? (+1, -0.33)

a. 12 December

b. 15 January

c. 12 November

d. 15 July

---

71. If 5 : 9 : : x : 27 , then x = ? **(+1, -0.33)**

a. 6

b. 3

c. 18

d. 15

---

72. Let the volume of a cube be V. What will be the volume if its side is doubled? **(+1, -0.33)**

a. 4V

b. 3V

c. 8V

d. 2V

---

73. Consider the statement and the following arguments and decide which of the arguments is strong with respect to the statement. **(+1, -0.33)**

Statement:

We should practice walking barefoot on the grass, as it helps to balance the energy of the body.

Argument:

I. Yes, walking on grass gives us energy from the earth, and helps in maintaining better health.

II. No, there are many other ways to create good health.

a. Only Argument II is strong

b. Only argument I is strong

c. Neither I nor II is strong

d. Arguments I and II both are strong

---

74. In a concave mirror, where should the object be placed to obtain a real inverted and smaller image between C and F? **(+1, -0.33)**

a. On C

b. Beyond C

c. Between F and C

d. Between F and P

---

75. Find the number which is 30% more than 240. **(+1, -0.33)**

a. 312

b. 340

c. 331

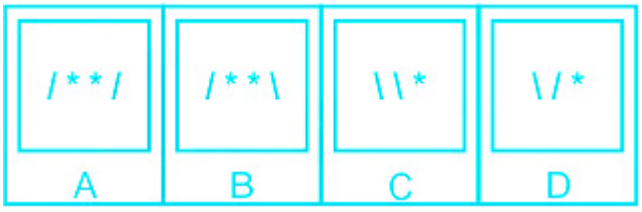
d. 320

---

76. 

(+1, -0.33)

Choose the correct figure from the following alternatives, which is next in the sequence of the above five figures.



a. B

b. C

c. D

d. A

---

77. _____ is known as Shattantri Veena in Sanskrit text and has 72 strings. **(+1, -0.33)**

a. Khanjari

b. Sarood

c. Santoor

d. Sitar

---

78. The electronic configuration of an element is 1s 2 2s 2 2p 6 3s 2 3p 3 . What will be the atomic number of the element just below the said element in the periodic table? **(+1, -0.33)**

a. 39

b. 33

c. 34

d. 31

---

79. Who is the author of Pashmina, the compassionate story of an Indian American girl? **(+1, -0.33)**

a. Nidhi Chanani

b. Diksha Basu

c. Aditi Khurana

d. Roshani Chokshi

---

80. If $\sqrt{1296} = (?)^2$, then what will be the value of (?)? **(+1, -0.33)**

a. 6

b. 18

c. 8

d. 12

---

81. Three statements are followed by two conclusions numbered I and II. You have to take all the statements to be true even if they seem to be at variance from commonly known facts. Decide which of the conclusions follow from the statement. **(+1, -0.33)**

Statement:

1) All blue is red.

2) No red is green.

3) All green are yellow.

Conclusion:

I. All blue being yellow is a possibility.

II. No blue is yellow.

a. Only I follows.

b. Only II follows.

c. Both I and II follow.

d. Neither I nor II follow.

---

82. Which of the following can be generated by regeneration as well as budding? **(+1, -0.33)**

a. Amoeba

b. Yeast

c. Hydra

d. Plasmodium

83. Which of the following statement is true? **(+1, -0.33)**

A. The value of 'g' on Mount Everest is >g

B. The value of 'g' on Mount Everest is <g

C. A ball thrown vertically comes back to the ground after 15 seconds. Its velocity is 75 m/s.

D. A ball thrown vertically comes back to the ground after 15 seconds. Its velocity is 150 m/s.

a. Only statements B and D are true

b. Only statement D is true

c. Only statements B and C are true

d. Only statement B is true

---

84. Shalini, Tanveer and Rashid shared a cake. Shalini had $\frac{1}{6}$ th of it, Tanveer had $\frac{1}{4}$ th of it and Rashid had the rest. What was Rashid's piece of cake? **(+1, -0.33)**

a. $\frac{5}{6}$

b. $\frac{3}{5}$

c. $\frac{13}{15}$

d. $\frac{7}{12}$

---

85. Who among the following is the first woman President of India? **(+1, -0.33)**

a. Prerna Patil

b. Smita Patil

c. Indira Gandhi

d. Pratibha Patil

---

86. As of June 2018, which political party is in power in Karnataka? **(+1, -0.33)**

a. Only JD (S)

b. Congress and JD (S) alliance

c. BJP

d. CPM

---

87. If a number is divisible by 8, what can be its last digit? **(+1, -0.33)**

a. 5

b. 4

c. 1

d. 3

---

88. Complete the following analogy- **(+1, -0.33)**

Big : Large : : Thin : ?

a. Slim

b. Skelton

c. Weak

d. Skinny

---

89. What will be the least common factor of 36, 27 and 72? **(+1, -0.33)**

a. 108

b. 432

c. 324

d. 216

---

90. Distribute 400 among 6 men, 12 women and 17 boys in such a way that 2 men get an amount equal to 5 boys and 2 women get an amount equal to 3 boys. How much money was given to a man, a woman and a boy? **(+1, -0.33)**

a. Rs. 40

b. Rs. 50

c. Rs. 45

d. Rs. 38

---

91. Viswanathan Anand was awarded Padma Vibhushan in the year _____- **(+1, -0.33)**

a. 2003

b. 2008

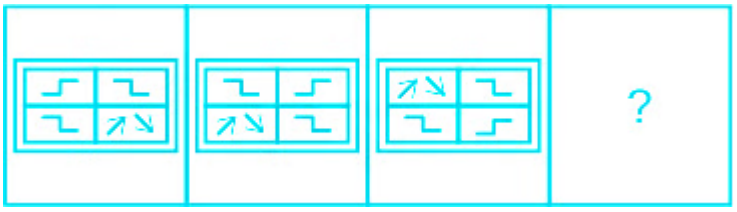
c. 2005

d. 2007

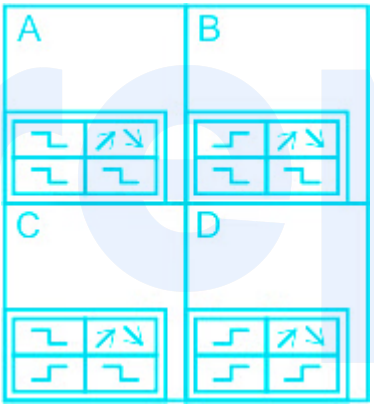
---

92. Select from the option figures to complete the series of question figures. **(+1, -0.33)**

Question figure:



Optionfigure:



a. D

b. B

c. A

d. C

---

93. A question and two statements are given below. Identify which statement(s) is/are necessary/sufficient to answer the question? **(+1, -0.33)**

Question:

How many students play cricket in the class?

Statement:

I. There are 32 boys and 28 girls in the class.

II. Only boys play cricket.

a. Either statement I or II is sufficient

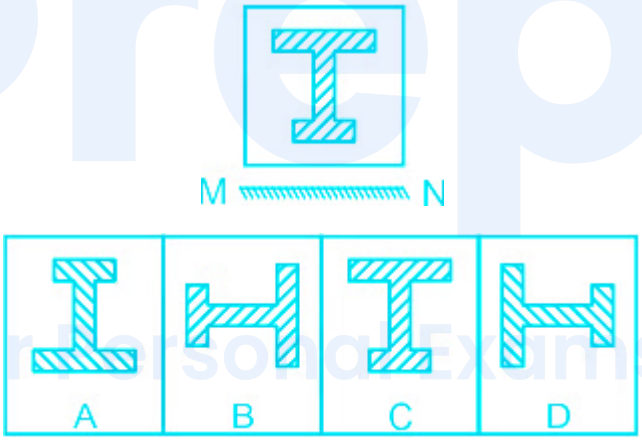
b. Only statement II is sufficient

c. Both the statements I and II together are sufficient

d. Only statement I is sufficient

---

94. Select the mirror image for the figure given below- **(+1, -0.33)**



a. B

b. D

c. C

d. A

---

95. Where are the elements of D block found? **(+1, -0.33)**

a. Only 18th group

b. Only e lements of group 8

c. 9th group elements

d. Between second to 13(3-12)

---

96. ABCDEFGHIJKLMNOPQRSTUVWXYZ **(+1, -0.33)**

Which letter is 5th to the left of the 9th letter from the right?

a. N

b. K

c. L

d. M

---

97. If in a certain code, SILK is coded as QGJI, then which word will be coded as VOTE in that code? **(+1, -0.33)**

a. MTRC

b. RTCM

c. TMRC

d. TRCM

---

98. Which of the following is **NOT** a unit of temperature? **(+1, -0.33)**

a. Fahrenheit

b. Pascal

c. Celsius

d. Kelvin

---

99. A man sold two cycles at a total profit of 20%. If he had bought them each for 3,500 and the first one sold them at a profit of 5%, then what is the profit (%) he should have from the second? **(+1, -0.33)**

a. 20%

b. 35%

c. 25%

d. 30%

---

100. If a steel rod $40\frac{3}{5}$ long is cut into three equal pieces, then the length of each piece is- **(+1, -0.33)**

a. $13\frac{7}{15}$

b. $13\frac{8}{15}$

c. $13\frac{10}{15}$

d. $13\frac{9}{15}$

Answers

1. **Answer: d**

Explanation:

The correct answer is **Satya Pal Malik**.

- **Satya Pal Malik** wa s the **35th Governor of Bihar.**
- **Satya Pal Malik** was governor of **Bihar** from **30 September 2017** to **23 August 2018** .
- **Phagu Chauhan** is an **Indian politician** serving as the **29th** and current **Governor** of **Bihar** since **2019.**

⭐ **Key Points**

- The **Governor's appointment,** his powers, and everything related to the office of **Governor** have been discussed under **Article 153** to **Article 162** of the **Indian Constitution** .
- The role of the Governor is quite similar to that of the **President of India** .
- Governor is the **constitutional head** of the state, bound by the advice of his council of ministers.
- Governor functions as a **vital link** between the **Union Government** and the **State Government.**

⭐ **Additional Information**

Person Name	Details
D. Y. Patil	• Dnyandeo Yashwantrao Patil is an Indian politician who was Governor of Bihar, a state in eastern India from 29 May 2012 to 26 November 2014. • He was appointed as the Governor of West Bengal (additional charge).
Ram Nath Kovind	• Ram Nath Kovind is an Indian politician serving as the 14th and current president of India since his inauguration in 2017. • He served as the 26th governor of Bihar from 2015 to 2017 and as a member of Parliament, Rajya Sabha from 1994 to 2006.
Devanand Konwar	• Devanand Konwar was a senior congressman from Assam who served as the Governor of the Indian states of Tripura, Bihar, and West Bengal. • In 1968-69 he established a Degree College in Guwahati City known as Guwahati College as its founder Principal.
Satya Pal Malik	• Satya Pal Malik was born on 24 July 1946 and is an Indian politician serving as the 21st and current Governor of Meghalaya. • He was the Governor of Jammu and Kashmir from August 2018 to October 2019. • He was the 18th Governor of Goa.

2. **Answer: d**

Explanation:

The correct answer is **Telangana**.

- The first Indian state to launch **Single Women Pension Scheme** in **Telangana** .

⭐ Key Points

- **Telangana** government on **4 June 2017** launched the **single-women pension scheme** across the **state.**
- Under the scheme, the state government would be given a pension of about **Rs 1000 per month** to **single women** on **humanitarian grounds.**
- While earlier, the government spent only **Rs 800 crores** on pensions to **29 lakh beneficiaries** , now it would be spending **Rs 5,600 Cr** per annum and benefiting around **38 lakh people.**

⭐ Additional Information

State	Schemes for Women's
Maharashtra	• Manodhairya Scheme. • ASMITA Yojana. • Rajmata Jijau Mother-Child Health & Nutrition Mission.
Gujrat	• Beti Bachao (Save Girl Child). • Gaurav Nari Niti Women's Pride, Gender Equality. • Balika Samruddhi Yojna Girl Child Development. • Kishori Shakti Yojna Adolescents, Strenth and Awareness. • Swayamsidh Yojna Self Reliance and Empowerment.
Delhi	• Beti Bachao Beti Padhao Scheme. • One-Stop Centre Scheme. • Women Helpline Scheme. • Working Women Hostel. • UJJAWALA.

3. **Answer: a**

Explanation:

The correct answer is **Football.**

⭐ **Key Points**

- **'Bandodkar Gold Trophy'** is associated with the sports of Football.
- **The Bandodkar Gold Cup** was made of pure gold weighing several kilos.
- The trophy was instituted in **1970** , by then Chief Minister, the late **Dayanand Bandodkar.**
- The Bandodkar Gold Cup was one of the top football tournaments in business in that era.
- The tournament was disbanded in **1994** , only to be revived some years back by the Association.

⭐ **Additional Information**

Sports	Trophies Associated
Tennis & Table Tennis	Rajendra Prasad Cup, Corbillion Cup Corbitton Cup (Women) Jaylaxmi Cup (Women's) Rajkumar Cup (Junior boys) Rajkumari Challenge Cup, etc.
Golf	Amateur Championship of India, IGU Handicap Stableford, A.D.Vickers Trophy, Mid Amateur Trophy, etc.
Kho-Kho	Junior National Kho Kho C'ship, National-kho-kho-championship, etc.

---

4. **Answer: a**

Explanation:

The correct answer is **Vinod Tawde**.

- The Minister of **Higher and Technical Education** for the state of **Maharashtra** is **Vinod Tawde** .

⭐ Key Points

- **Vinod Tawade** is an**Indian politician** from **Maharashtra** and a **senior leader** of the **Bharatiya Janata Party** (BJP).
- In **1995, Vinod Tawde** was first named as the **Maharashtra General Secretary** of the **BJP** and he served up to **1999** .
- In 1 **999, Vinod Tawde** was elected as the **President** of the **Mumbai Metropolitan Unit** of the BJP.

Person Name	Constituency	Department	Party
Vinod Tawde	Borivali	• Higher and Technical Education. • Marathi Bhasha. • Cultural Affairs. • Minorities Development, and Wakf.	• BJP

⭐ Additional Information

Person Name	Details
Chandrakant Patil	• Chandrakant Patil is an Indian politician who is the Maharashtra state President of Bharatiya Janata Party since 2019. • In June 2014, he was appointed as a member of the Maharashtra Legislative Council. • In October 2014, he was elected as Cabinet Minister of Maharashtra.
Prakash Mehta	• Prakash Mehta is an Indian politician from Maharashtra and a senior leader of the Bharatiya Janata Party. • He was the President of the Mumbai BJP Unit. Prakash Mehta was the State Cabinet Minister for Housing Department.
Pankaja Munde	• Pankaja Munde Indian politician from the state of Maharashtra and National Secretary of Bharatiya Janata Party (BJP). • Pankaja Munde was the Minister of Rural and Women, Child Development in the Devendra Fadnavis cabinet. • Pankaja Munde served as the State President of BJP's youth wing, the Bharatiya Janata Yuva Morcha (BJYM), in 2012.

5. **Answer: a**

Explanation:

Figure D is embedded in the question figure as follows:

Hence, **"option 1"** is the correct answer.

---

6. Answer: d

Explanation:

The correct answer is **C n H 2n.**

- **Alkenes** , unsaturated hydrocarbons containing a double bond between two carbon atoms, have a general formula, is **Cn H 2n.**

⭐ **Key Points**

- **Alkenes** contain **carbon-carbon double bonds** and are unsaturated hydrocarbons with the molecular formula is **CnH2n.**
- This is also the same **molecular formula** as **cycloalkanes** .

⭐ **Additional Information**

- **General Properties of Alkenes:**
  - **Physical state:** The members containing two or four carbon atoms are gases, five to seventeen, liquids, eighteen onwards, solids at room temperature and they burn in air with a luminous smoky flame.
  - **Density:**Alkenes are lighter than water.
  - **Solubility:** Alkenes are insoluble in water and soluble in organic solvents such as benzene etc.
  - **Boiling point:** The boiling points of alkenes show a gradual increase with an increase in the molecular mass or chain length.

⭐ **Important Points**

Formula	Details
C n H 2n+2	• Hydrocarbons having single bond between two carbon atoms are known as alkane.
C n H 2n-1	• Alkenyl (CnH2n-1) is the hydrocarbon group that derived an alkene by removal of one hydrogen atom.

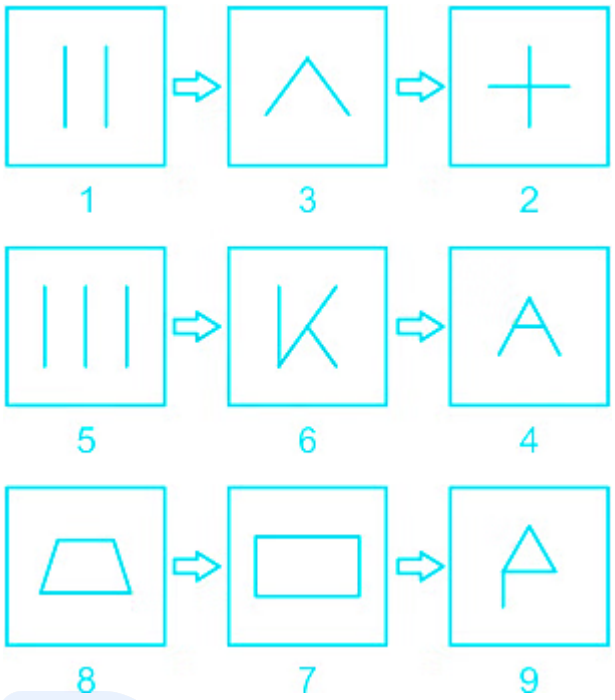
---

7. **Answer: b**

Explanation:

The pattern followed here is:

- Figure 1 = Figure 3 = Figure 2 = minimum 2 lines
  - ⇒ (1, 3, 2)
- Figure 5 = Figure 6 = Figure 4 = minimum 3 lines
  - ⇒ (5, 6, 4)
- Figure 8 = Figure 7 = Figure 9 = minimum 4 lines
  - ⇒ (8, 7, 9)



Hence, **"option 2"** is the correct answer.

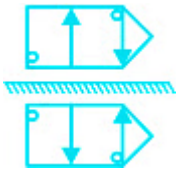
---

8. **Answer: b**

Explanation:

The closest resemblance to the question figure is given below:-

- Water image of the given figure.



Hence, **"option 2"** is the correct answer.

---

9. **Answer: d**

Explanation:

The correct answer is **Lord Dalhousie**.

- **Lord Dalhousie** who took over as the **Governor-General** in **1848** formulated a policy called **Doctrine of Lapse** .

⭐ Key Points

- The **doctrine of Lapse** was the **policy** devised by the **Governor-General** of the **East India Company** in **India.**
- This **doctrine** was based on the **idea** that in case a **ruler** of a dependent **state** died childless, the right of ruling over the state reverted or lapsed to the **sovereign** .
- According to this doctrine, if any **Indian ruler dies** without **leaving a male** heir, his **kingdom would automatically pass over to the British.**
- The **Doctrine of Lapse** was **withdrawn** by **Lord Canning** (1857-1861).

⭐ Additional Information

Person Name	Details
Lord Wellesley	• Major-General Lord Charles Wellesley was a British politician, soldier and courtier. • Wellesley represented the Conservative Party as the Member of Parliament (MP) for South Hampshire from 1842 to 1852. • He was also a Chief Equerry and Clerk Marshal to Queen Victoria.
Lord William	• He was born on 14 September 1774, Buckinghamshire, United Kingdom. • Lieutenant General Lord William Henry Cavendish-Bentinck, known as Lord William Bentinck, was a British soldier and statesman. • He served as Governor-General of India from 1828 to 1835. • He reformed the court system in India during his period.
Lord Cornwallis	• Charles Cornwallis was appointed in February 1786 to serve as both Commander-in-Chief of British India and Governor of the Presidency of Fort William, also known as the Bengal Presidency. • Cornwallis was charged by the directors of the British East India Company to overhaul and reform its administration in India. • He was raised to the title of Marquess Cornwallis in 1792 as recognition for his performance in the Third Anglo-Mysore War.
Lord Dalhousie	• Lord Dalhousie, was a Scottish statesman and colonial administrator in British India. • He served as Governor-General of India from 1848 to 1856. • In 1849, under Dalhousie's command, the British captured the princely state of Punjab.

10. **Answer: d**

Explanation:

The logic followed here is:-

Hence, **"option 4"** is the correct answer.

---

11. **Answer: d**

Explanation:

Given:

Tap A fill the tank in 8 hours

Tap B fill the tank in 10 hours

Tap C empty the tank in 12 hours

Concept used:

Time = Work/Efficiency

Calculation:

LCM of 8, 10, 12 = 120

Total capacity of tank = 120 units

Efficiency of Tap A = 120/8 = 15 units

Efficiency of Tap B = 120 /10 = 12 units

Efficiency of Tap C = 120/ 12 = 10 units

Effective of these three tanks together = (15 + 12 – 10) = 17 unit

Time taken to fill the tank when they all opened simultaneously = 120 /17 = 7.0588 ≈ 7 hours

∴ T he empty tank be completely filled in 7 hours

---

12. Answer: b

Explanation:

The question is implicitly asking whether the government should allow new industries or not.

- Argument I suggests that the government should stop allowing new industries because they cause environmental pollution, however, it is not true. It cannot be claimed that all new industries will cause pollution. Thus, argument I is not strong.
- Argument II talks against stopping new industries, meaning that new industries should be allowed because they help in economic development. This is a valid and strong point. Thus, argument II is strong.

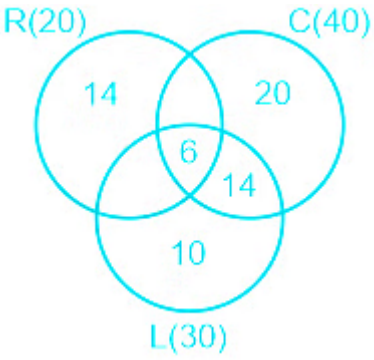
Hence the correct answer is **option 2** .

---

13. Answer: d

Explanation:

Calculation:



Only Rose = 14

Only Cinnamon = 20

Only Lemongrass = 10

Total = 14 + 20 + 10 = 44

∴ 44 bought only one fragrance

---

14. **Answer: b**

Explanation:

Given:

$(x^2 + 4x + 4)(x^2 + 6x + 9)$

Formula used:

$(a + b)^2 = a^2 + b^2 + 2ab$

Calculation:

$(x^2 + 4x + 4)(x^2 + 6x + 9)$

$\Rightarrow \sqrt{[(x^2 + 4x + 4)(x^2 + 6x + 9)]}$

$\Rightarrow \sqrt{[(x + 2)^2 (x + 3)^2]}$

$\Rightarrow (x + 2)(x + 3)$

∴ Required square root is $(x + 2)(x + 3)$

---

15. **Answer: a**

Explanation:

The correct answer is **Lipstick under my burqa**.

- **Lipstick under my burqa** won the **Global Sustainability Film Award** for **India** in **London, 2017.**

⭐ **Key Points**

- I n London **Lipstick Under My Burkha** , which explores **women's sexuality,** has bagged a top prize at the time **Global Sustainability Film Awards 2017.**
- **Lipstick Under My Burkha** is produced by **Prakash Jha** and directed by **Alankrita Shrivastava** and stars **Konkona SenSharma** and **Ratna Pathak Shah** .
- The Founders Award for Sustainability on the **Big Screen** was introduced this year and sponsored by philanthropist **Surina Narula** .

⭐ **Additional Information**

Movie Name	Director
Neerja	Ram Madhavan
Pink	Aniruddha Roy Chowdhury
Queen	Vikas Bahl

---

16. **Answer: c**

Explanation:

Given:

Number of candles make by 12 workers = 111

Calculation:

According to the question

12 workers make candles = 111

1 worker make candles = (12/111)

Then,

Number of 148 candles make by = (12/111 × 148)

⇒ (1776/111)

⇒ 16

∴ Required People is 16

---

17. **Answer: d**

Explanation:

The correct answer is **GM/R 2**

- **Gravity** is the force with which the earth attracts a body towards its centre.
- Acceleration is defined as the rate of change of velocity with respect to time.
- **Acceleration** is a **vector quantity** that is described as the frequency at which a body's **velocity changes.**

⭐ Key Points

- SI unit and Formula:
  - The S.I unit for acceleration is meter per second square or m/s2.
  - Mathematically acceleration is denoted as a= Change in velocity / Time taken.

⭐ Additional Information

- The types of acceleration are:
  - Uniform acceleration: When an object is travelling in a straight line with an increase in velocity at equal intervals of time, then the object is said to be in uniform acceleration. The free-falling of an object is an example of uniform acceleration.
  - Non-uniform acceleration: When an object is travelling with an increase in velocity but not at equal intervals of time is known as non-uniform acceleration. Bus moving or leaving from the bus stop is an example of non-uniform acceleration.
  - Instantaneous acceleration: The acceleration of an object at any instant of time is known as instantaneous acceleration.

---

18. **Answer: a**

Explanation:

The correct answer is **Thick**.

- The **wall** of the **ventricle** is **Thick** from the wall of the **atrium** .

⭐ **Key Points**

- **Atrial walls** are **thinner** compared to the **thickness** of **ventricular walls** . Moreover, embedded in the **atrial wall** is pacemaker of the **heart.**
- Atria of the heart are **receiving chambers** while **ventricles pump** the **blood forcefully** to all **organs of the body** . Hence muscle mass around ventricles is **thickened** compared to that around **atria** .
- The stimulus for rhythmic contraction of the heart originates inside the **auricular wall** due to the presence of the **sinoatrial node** .
- Moreover, the myocardium of both atria together form a **functional syncytium** and it remains completely separated from the **ventricular myocardial syncytium.**

---

19. **Answer: c**

Explanation:

The correct answer is **Aluminium**.

- In aluminium, the speed of sound is maximum at **25°C.**

⭐ **Key Points**

- Out of the following, the speed of sound is maximum in **Aluminium** .
- The speed of sound in Aluminium at 25 deg Celsius is around **6420 m/s** .
- The matter or substance through which sound is transmitted is called a **medium** .**It can be solid, liquid, or gas.**
- Sound is a **mechanical wave** and needs a material medium for its propagation. **It cannot travel through a vacuum.**

Sound travels at **different speeds depending on what it is travelling through.**

- Of the three mediums (gas, liquid, and solid) sound waves travel the **slowest through gases, faster through liquids, and fastest through solids** .
- **Temperature also affects the speed of sound** .
- For Example, at 0° Celcius, sound travels through air at **331 meters per second** , but, at **20°C** , room temperature, sound travels at 3 **43 meters per second.**

---

20. Answer: c

Explanation:

Given:

Three sides are 6 cm, 11 cm, 13 cm,

Concept used:

Area of a triangle = 1/2 × base × height

Calculation:

Ratio of heights = $1/2 \times 6 \times h_1 : 1/2 \times 11 \times h_2 : 1/2 \times 13 \times h_3$

$\Rightarrow 6h_1 : 11h_2 : 13h_3$

L.C.M of 6, 11, 13 = 858

$h_1 : h_2 : h_3 = 143 : 78 : 66$

∴ The ratio of their respective heights from the opposite vertex will be 143 : 78 : 66

---

21. Answer: b

Explanation:

Given:

$\sqrt{\frac{?}{3136}} = \frac{1}{2}$

Calculation:

Let the missing number be x

Squaring both sides we get,

$\Rightarrow (\sqrt{x}/3136)^2 = (1/2)^2$

$\Rightarrow x/3136 = 1/4$

$\Rightarrow x = (3136/4)$

$\Rightarrow x = 784$

∴ The required value is 784

---

22. Answer: b

Explanation:

Concept used:

Arithmetic means → The total of the sum of all values in a collection of numbers divided by the number of numbers in a collection. It is calculated in the following way

Calculation:

Mean = (43 × 13 + 44 × 15 + 45 × 22 + 46 × 21 + 47 × 16 + 48 × 14)/(13 + 15 + 22 + 21 + 16 + 14)

⇒ 4599/101

⇒ 45.53

∴ Required mean is 45.5

---

23. Answer: c

Explanation:

The correct answer is **10A**.

- **Solution:**
  - Potential difference , V = 60.
  - Current, I = 4A.
- **By Ohms law** .
  - Resistance, R = V/I
  - 60 V/4A = 15 Ohms.
- When the potential difference is increased to 150V, the current drawn by the heater will be
  - I = V/R
  - I = 150 V/ 15 Ohms
  - **10 A.**

---

24. **Answer: b**

Explanation:

Concept Used:

Follow the BODMAS rule according to the table given below:

B	Brackets in order (), {}, []	ब्रैकेट (), {}, [] क्रम में
O	of	का
D	Division (÷)	विभाजन (÷)
M	Multiplication (×)	गुणा (×)
A	Addition (+)	जोड़ (+)
S	Subtraction (–)	घटाव (–)

Calculation:

$36 \div \frac{1}{4}$

⇒ 36 × 4/1

⇒ 144

∴ The required value is 144

---

25. **Answer: b**

Explanation:

The correct answer is 588 J.

★ Key Points

- Given,
  - Mass, m = 10 kg.
  - height, h = 6 m
  - g = 9.8 ms^{-2}
- Potential energy = mgh
  - = 10 x 6 x 9.8
  - = 588 J.

⭐ **Additional Information**

- Potential Energy:
  - It is the energy possessed by a body by virtue of its position.
  - PE of a body in the gravitational field of the earth is mgh.
  - where m = mass, g = acceleration due to gravity, h = height of the body from the surface of the earth.
  - When a body is falling downwards, then its potential energy goes on changing to kinetic energy.

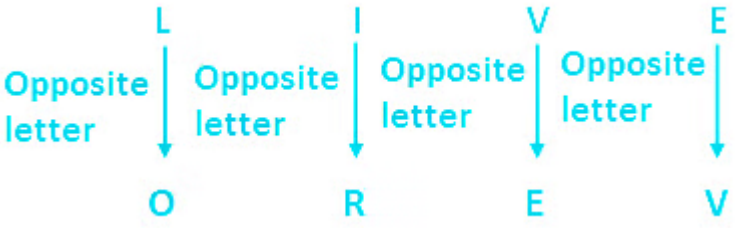
---

26. Answer: d

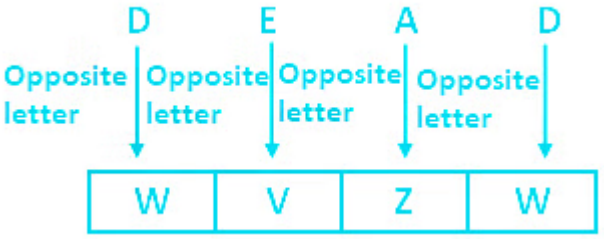
Explanation:

Alphabets	A	B	C	D	E	F	G	H	I	J	K	L	M
Positional value	1	2	3	4	5	6	7	8	9	10	11	12	13
Positional value	26	25	24	23	22	21	20	19	18	17	16	15	14
Alphabets	Z	Y	X	W	V	U	T	S	R	Q	P	O	N

The logic followed here is:-



Similarly,



Hence, **"option 4"** is the correct answer.

---

27. Answer: b

Explanation:

The correct answer is **Dr Harsh Vardhan**.

- **Harsh Vardhan** is the **Union Minister of Environment and Climate Change** (as of July 2018).

⭐ **Key Points**

- The **Union Minister of Environment and Climate change** was formed in **1947** and its **headquarters** is located in **New Delhi** .
- As of now the **Union Minister of Environment and Climate Change** is held by **Bhupendra Yadav.**
- The ministry is responsible for **planning, promoting, coordinating** , and overseeing the implementation of **environmental and forestry programs** in the **country** .

⭐ **Additional Information**

Person Name	Details
Rajnath Singh	• Rajnath Singh is an Indian politician serving as the Defence Minister of India. • He is currently the Deputy Leader of the House Lok Sabha. • He is the former President of the Bharatiya Janata Party. • He has previously served as the Chief Minister of Uttar Pradesh and as a Cabinet Minister in the Vajpayee Government.
Dr. Harsh Vardhan	• Harsh Vardhan is an Indian otorhinolaryngologist. • He had served as the Minister of Health and Family Welfare, Minister of Science and Technology and Minister of Earth Sciences in the BJP-led NDA government of Prime Minister Narendra Modi from 30 May 2019 to 7 July 2021.
Prakash Javadekar	• Javadekar is now the Human Resource and Development Minister of India and also a veteran spokesperson of the Bharatiya Janata Party. • Before becoming a National Spokesperson, he was also a Spokesperson for the Maharashtra BJP. • Javadekar previously served as the Minister of Environment, Forest and Climate Change, Minister of Information and Broadcasting, and Minister of Heavy Industries and Public Enterprises between 2014 to 2021.
V.K. Singh	• General Singh has been the Member of Parliament (Lok Sabha) representing the Ghaziabad constituency (Uttar Pradesh) since 2014. • General Singh served as the 24th chief of staff in the Indian Army (2010-12).

		• In 2015, he spearheaded 'Operation Raahat' for the evacuation of Indian citizens and other foreign nationals from war-torn Yemen.

28. **Answer: b**

Explanation:

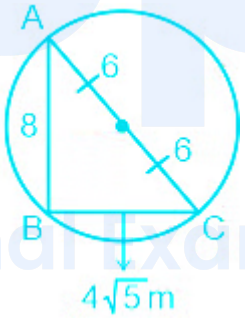
Given:

Sides are 8 cm, $4\sqrt{5}$ cm, and 12 cm

Concept used:

The area of the circumcircle of a right-angle triangle when the hypotenuse(H) of the triangle is given is found using the formula $\pi H^2/4$

Calculation:



In the figure, AB = 8 cm, BC = $4\sqrt{5}$ cm and CA = 12 cm

We can observe that AC is the diameter of the circumcircle

So, Radius of circumcircle = OA = OC = 12/2 = 6 cm

Area of circumcircle = $\pi \times 6^2 = 36\pi$ cm^2

∴ Area of the circumcircle is 36 π cm 2

29. **Answer: d**

Explanation:

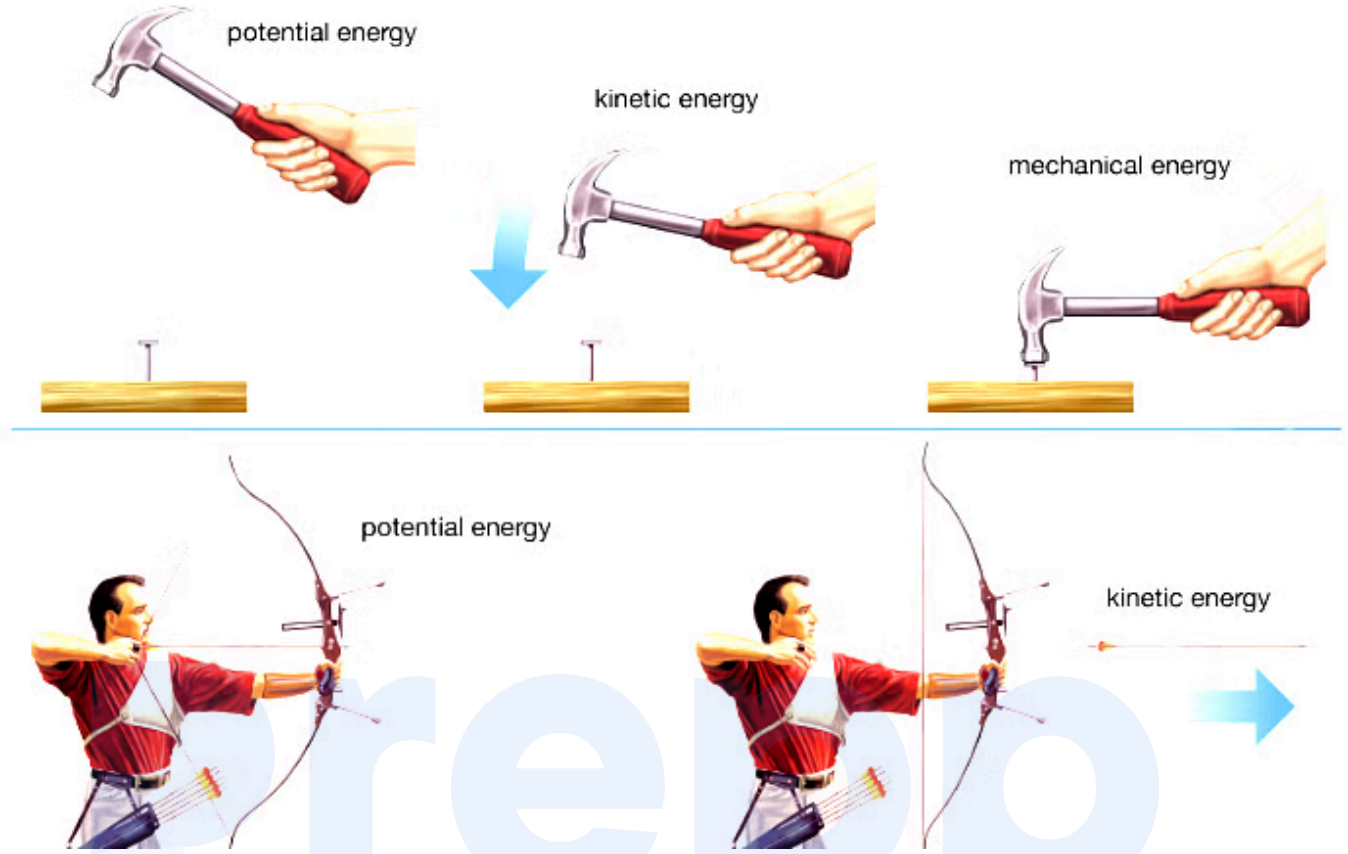
The correct answer is **A, B, C, D**.

- **Potential energy** , stored energy that depends upon the **relative position of various parts** of a system.
- **Spring** has **more potential energy** when it is **compressed** or **stretched.**
- A **steel ball** has more potential energy raised above the **ground** than it has after **falling to Earth.**

⭐ Key Points

- The term **potential energy** was introduced by the **19th-century Scottish engineer** and physicist **William Rankine** , although it has links to Greek philosopher **Aristotle's concept of potentiality** .

⭐ Additional Information



30. **Answer: b**

Explanation:

The statement simply talks about all people loving Indian clothes.

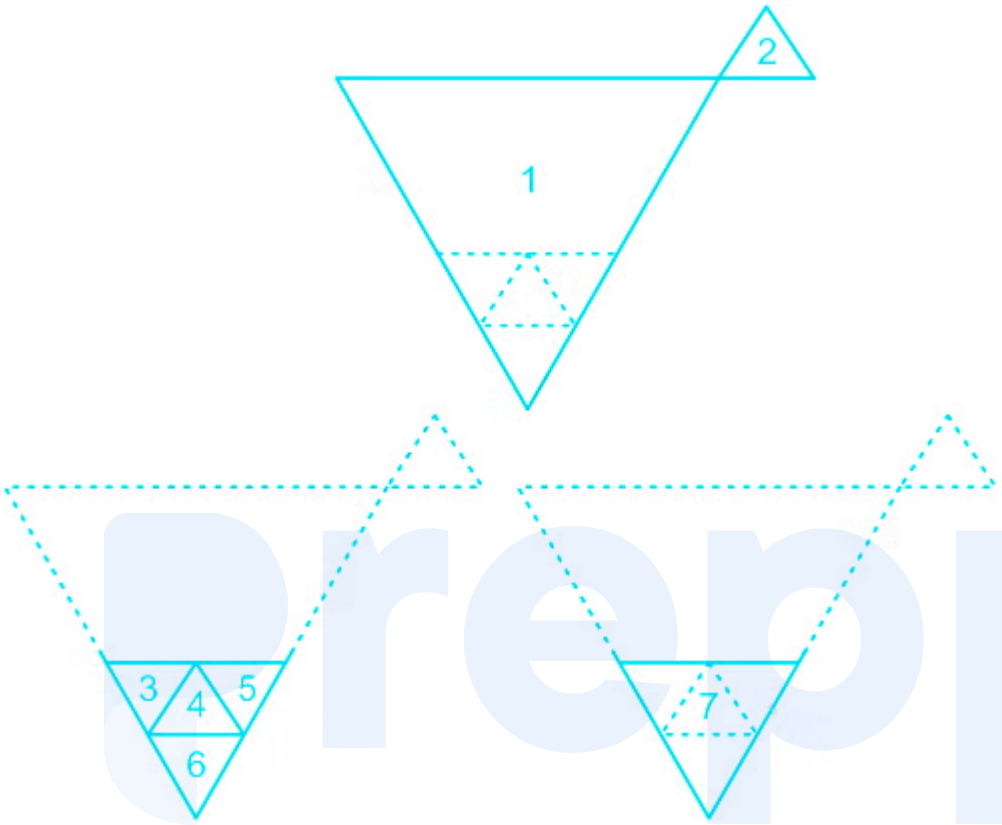
- It does not talk about which types of clothes are available in the market, or Indian clothes being the only choice available. So, assumption I is not implicit.
- From the statement, nothing can be determined about people's opinion on any other type of clothes. Thus, assumption II is also not implicit.

Hence the correct answer is **option 2** .

31. **Answer: c**

Explanation:

The triangles are as follows:



The number of triangles is 7.

Hence, **"option 3"** is the correct answer.

---

32. Answer: c

Explanation:

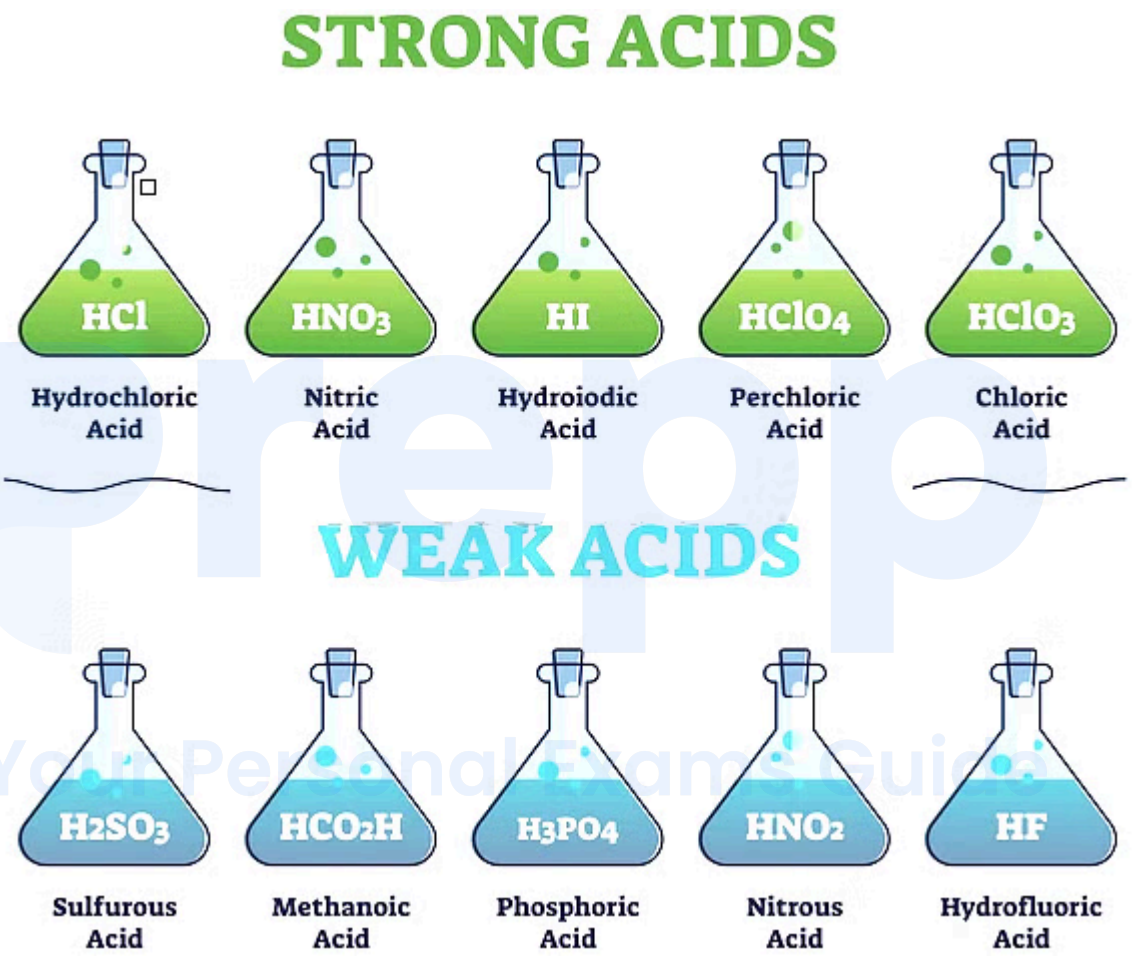
An **acid** is any hydrogen-containing **substance** that is capable of **donating a proton** (hydrogen ion) to **another substance** .

- In **1884, Svante Arrhenius** attributed the properties of **acidity** to **hydrogen ions** (H+), later described as **protons** or **hydrons** .

⭐ Key Points

- Acids react with **Bicarbonates to form Salt, Water and release Carbon Dioxide.**
- **Acid react with metal form salt with evolve of Hydrogen gas**

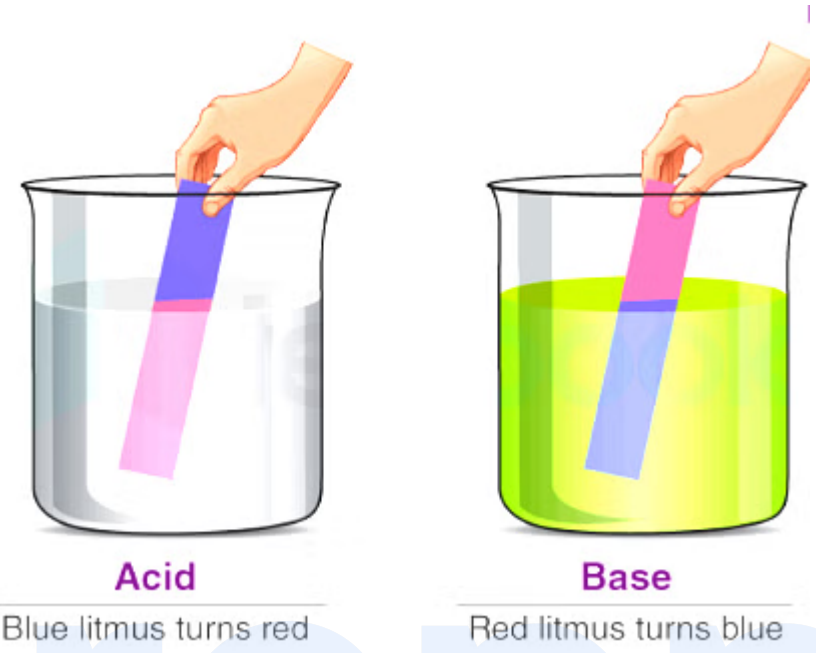
Thus r eacts with metals and bicarbonates to produce H_2O, CO_2 and salts is not true about acids.



⭐ Additional Information

- **The properties of acids are:**
  - Acids are corrosive in nature.
  - They are good conductors of electricity.
  - Their pH values are always less than 7.
  - When reacted with metals, these substances produce hydrogen gas.
  - Acids are sour-tasting substances.

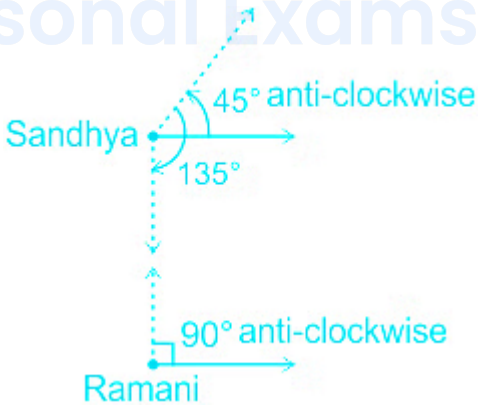
★ Important Points



33. **Answer: d**

Explanation:

The diagram is given below:-



- Ramani and Sandhya should be facing the opposite direction. Only then will they be facing each other.
- Therefore, Ramani has to rotate 90 $^{\circ}$ anticlockwise to face Sandhya.

Hence, **"option 4"** is the correct answer.

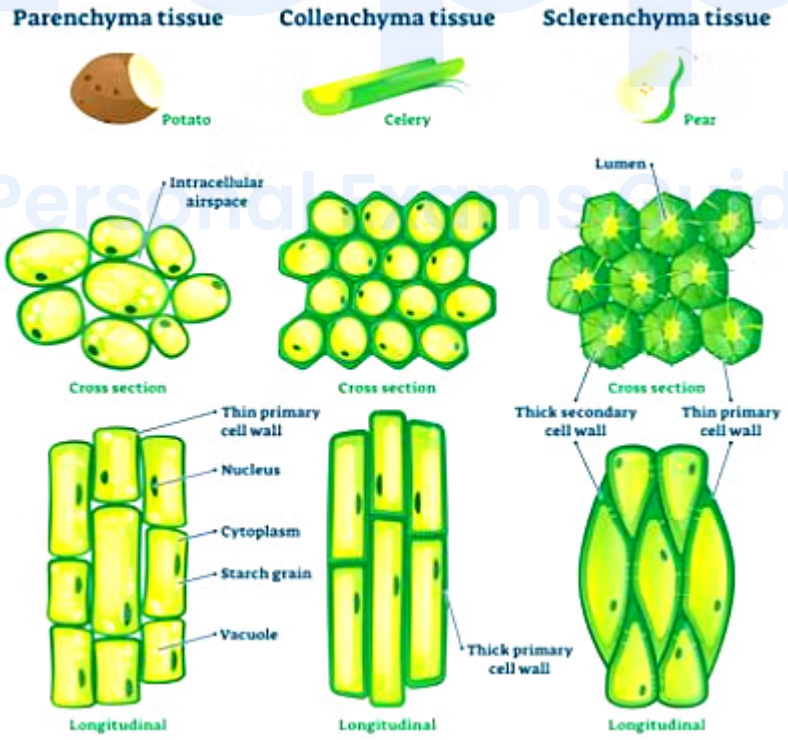
34. **Answer: c**

Explanation:

The correct answer is**Collenchyma** .

⭐ Key Points

- In**Collenchyma**tissue, the cells are living, long and irregularly thickened at the ends.
- Collenchyma tissue is composed of elongated living cells of uneven primary thick walls, which possess hemicellulose, cellulose, and pectic materials.
- It provides **support, structure, mechanical strength, and flexibility to the petiole, leaf veins, and stem of young plants** , allowing for easy bending without breakage.
- Collenchyma tissue is found immediately under the epidermis, young stems, petioles, and leaf veins.



⭐ Additional Information

Tissue	Description
Sclerenchyma	• Sclerenchyma is a type of permanent tissue found in plants. • Cells are usually dead without protoplasts.
Aeren chyma	• Aerenchyma is a spongy tissue that forms spaces/air channels in the leaves, stems, and roots of halophytic plants. • The presence of aerenchyma tissues helps in the exchange of gases between the shoot and the root systems.
Parenchyma	• Parenchyma is a type of simple permanent tissue that makes a major part of ground tissues in plants, where other tissues like vascular tissues are embedded.

35. **Answer: a**

Explanation:

Given:

Ratio of boys and girls = 7 : 3

Marks of boys and girls = 65 : 72

Concept used:

Average = Sum of elements/No. of elements

Calculation:

Let boys and girls be 7x and 3x

Total scores of boys = 455x

Total scores of girls = 216x

Total score = 455x + 216x

⇒ 671x

Average = 671x/10x

⇒ 67.1

∴ T he average marks of the whole class is 67.1

⭐ **Shortcut Trick**

Here,

72 - 4.9 = x or x - 65 = 2.1

So x = 67.1

∴ The average marks of the whole class is 67.1

---

36. Answer: c

Explanation:

The correct answer is 5.

- 5 atoms are present in a molecule of **Ca(OH) 2 .**

⭐ **Key Points**

- Ca is 1 since there is no subscript and O and H each have 2 because the subscript 2 is outside the parenthesis.
  - i.e. 1Ca+2O+2H = 5atoms

---

37. Answer: a

Explanation:

The logic followed here is as follows:

Plastic	It is not biodegradable material.
Wood	It is a biodegradable material.
Paper	It is a biodegradable material.
Wool	It is a biodegradable material.

Hence, **"option 1"** is the correct answer.

---

38. Answer: d

Explanation:

The correct answer is **Mizo National Front**.

⭐ **Key Points**

- **Zoramthanga** is led by **Mizo National Front** .
  - **Zoramthanga** was born on **13 July 1944** is an **Indian politician** who is the **Chief Minister** of **Mizoram.**
  - He is the president of the **Mizo National Front** (MNF) party. He had served as the **Chief Minister** of **Mizoram** from **December 1998** to **December 2008** , for **two consecutive terms** .
  - He joined the **Mizoram Legislative Assembly** as **Minister of Finance** and **Education** in **1987.**
  - In **1990,** when **Laldenga** died, he became the **President** of the **Mizo National Front** .

⭐ **Additional Information**

- The **Mizo National Front** is a regional **political party** in **Mizoram, India** .
- The **Mizo National Front** was founded in **1961** by **Laldenga** .

- MNF emerged from the **Mizo National Famine Front** , which was formed by **Pu Laldenga** to protest against the inaction of the **Indian central government** towards the famine situation in the **Mizo areas** of the **Assam** state in **1959** .

⭐ Important Points

Party Name	Details
Mizoram People's Conference	• The Mizoram People's Conference was a regional political party in Mizoram, India. • It was formed by Brig Thenphunga Sailo on 17 April 1975. • Ṭhenphunga was the party chairman and Chief Minister of Mizoram from 1979 to 1984
Naga People's Front	• The Naga People's Front is a regional political party in Nagaland and Manipur, India. • It headed the Nagaland government with the Bharatiya Janata Party, as part of the Democratic Alliance of Nagaland from 2003 to 2018. • Dr. Shürhozelie Liezietsu is the president of the party.
National People's Party	• The National People's Party is a national-level political party in India, though its influence is mostly concentrated in the state of Meghalaya. • The party was founded by P A Sangma after his expulsion from the NCP in July 2012. • It was accorded national party status on 7 June 2019.

39. **Answer: a**

Explanation:

The logic followed here is:-

Hot is the synonym of warm.

Similarly,

Antique is the synonym of Old.

Hence, **"option 1"** is the correct answer.

---

40. Answer: d

Explanation:

The correct answer is **Oscillatory**.

- The speed of the boy sitting on the swing is **Oscillatory** .

⭐ **Key Points**

- A motion repeating itself is referred to as **periodic or oscillatory motion** . An object in such motion **oscillates** about an **equilibrium position** due to a **restoring force or torque.**

⭐ **Additional Information**

- **Following are the examples of oscillatory motion:**
  - Series of oscillations are seen in the cosmological model.
  - Alternating current is an electrical example of oscillatory motion.
  - Movement of spring.
  - Vibrating strings of musical instruments is a mechanical example of oscillatory motion.

---

41. Answer: b

Explanation:

Given:

Investment in shop 1 = Rs. 100000

Investment in shop 2 = Rs. 150000

Calculation:

Total investment = 100000 + 150000 = 250000

Total recovered investment = 20 + 55 = 75%

So, remaining = 250000 × 25/100

⇒ 62500

∴ T he amount (in Rs.) received in Quarter 3 was Rs. 62500

---

42. Answer: b

Explanation:

1. T2, T1 is longer than T3

- T2, T1 > T3
- Here, we can say that the longest rod is either T1 or T2 but it is no definite information. Therefore, statement 1 alone is not sufficient.

2. T2 is an iron rod.

- No information is given about the size of rods T1, T2, and T3. Therefore, statement 2 alone is not sufficient.

Here, statements 1 and 2 are not sufficient to answer.

Hence, "option 2" is the correct answer.

---

43. **Answer: a**

Explanation:

Calculation:

Let the present age of son be x years

According to the question,

40 - x = x [He was equal to his son's present age at the time of his son's birth]

⇒ 2x = 40

⇒ x = 20

Present age of the son is 20 years

So, age 5 years ago = 20 - 5 = 15 years

∴ **The age of his son 5 years ago was 15 years**

---

44. **Answer: b**

Explanation:

The correct answer is

- August 2018,**Pradeep Singh Kharola**is the current **Chairman and Managing Director** of **Air India.**
- As of now the current Chairman and Managing Director of Air India is **Rajiv Bansal.**

⭐ Key Points

- **Air India** was founded on **15 October 1932** and its headquarter is located in **Delhi** .

- **Air India** had its origin as **Tata Air Services** later renamed to **Tata Airlines** founded by **J. R. D. Tata** of **Tata Sons** , an Indian aviator, and **business tycoon.**
- On **15 October 1932** , Tata flew a Puss Moth carrying air mail from Karachi to Bombay.
- After **World War II** , regular commercial service was restored in **India** and **Tata Airlines** became a **public limited company** on **29 July 1946** under the name **Air India** .
- After **Indian independence** in **1947** ,**49%** of the **airline** was acquired by the **Government of India** in **1948.**

---

45. Answer: d

Explanation:

Calculation:

36% of 325

⇒ 36/100 × 325

⇒ (9 × 13)

⇒ 117

∴ The required value is 117

---

46. Answer: a

Explanation:

The correct answer is 1.

⭐ Key Points

- At an instant, the acceleration of a rocket is proportional to the n th power of the velocity of exhaust gases. The value of n here is **1**.
  - If the gases are expelled at **velocity v** , then the rate of change in linear momentum is equal to **mv** where m is the **mass of the gases** .
  - Now the **equal and opposite force** is experienced on the rocket. If the force experienced by a rocket of **mass M** is **F**then the **acceleration** is M x a.
  - Now the forces are equal and opposite hence by using the two-equation, **F = mv** or **M x a = M x v.**
  - Hence from this equation the acceleration is **directly proportional to the first power** of velocity.

---

47. Answer: a

Explanation:

The correct answer is **Shirdi**.

- **Shirdi** is a religious city located in the **Indian state of Maharashtra.**

⭐ **Key Points**

- **Shirdi** is famously known as the home of the late **19th-century** saint **Shri Sai Baba** .
- **Sai Baba** visited **Shirdi** when he was **16 years** old and stayed there until he **died in 1918.**
- The **Shri Saibaba Sansthan** Trust located in **Shirdi** is one of the **richest temple organizations** .
- **Shirdi** has an **average literacy rate** of **70%** , higher than the **national average** of **59.5%.**
  - **Male literacy** is **76%,** and **female literacy** is **62%** . In **Shirdi** ,**15%** of the population is under **six years of age.**

⭐ **Additional Information**

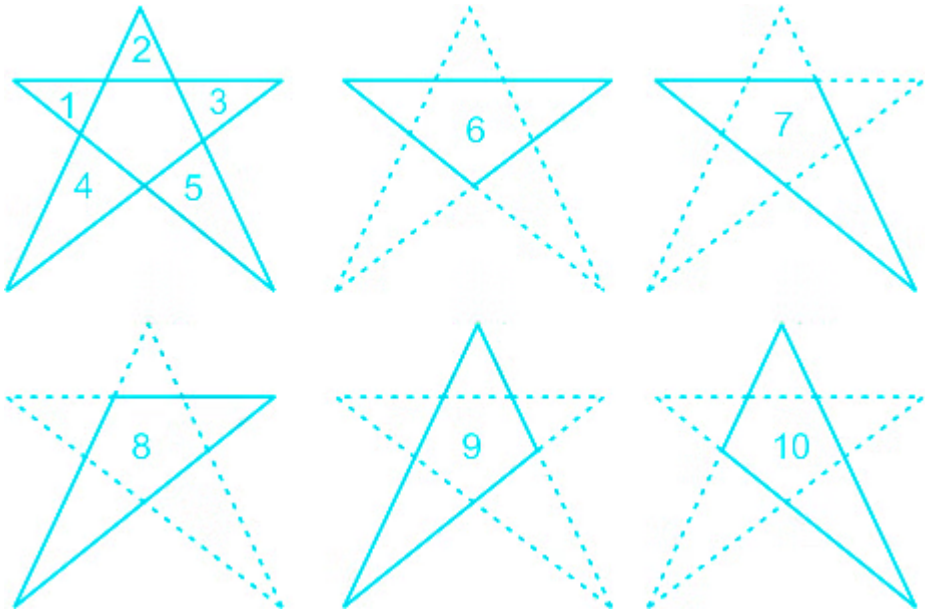
Place Name	Details
Rajgir	• Rajgir is an ancient city in the northeast Indian state of Bihar. • Rajgir history is linked with both Jainism and Buddism. • The 2,500-year-old Cyclopean Wall is located in Rajgir city.
Somnath	• Somnath temple on the western edge of the state is believed to be the place where the first of the twelve holy jyotirlingas emerged in India. • The temples lie at the meeting of Kapila, Hiran and Sarasvati rivers and the waves of the Arabian Sea. • The ancient temple's timeline can be traced from 649 BC but is believed to be older than that. The present form was reconstructed in 1951.
Kushinagar	• Kushinagar is a town in the Kushinagar district of the Indian state of Uttar Pradesh. • It is an important Buddhist pilgrimage site, where Buddhists believe Gautam Buddha attained Mahaparinirvana after his death. • It is an international Buddhist pilgrimage centre.

---

48. **Answer: c**

Explanation:

The triangles are as follows:



- The number of triangles is 10.

Hence, **"option 3"** is the correct answer.

---

49. Answer: b

Explanation:

According to the given pie chart,

20% of the total expenses is in Binding

50000 × 20/100

⇒ Rs. 10000

∴ T he binding cost is Rs. 10000

---

50. Answer: c

Explanation:

Given:

$\sqrt{50} + \sqrt{128} = \sqrt{N}$

Calculation:

$\sqrt{50} + \sqrt{128} = \sqrt{N}$

⇒ 5√2 + 8√2 = √N

⇒ 13√2 = √N

⇒ N = $(13\sqrt{2})^2$

⇒ N = (169 × 2)

⇒ N = 338

∴ **The required value of N is 338**

---

51. Answer: c

Explanation:

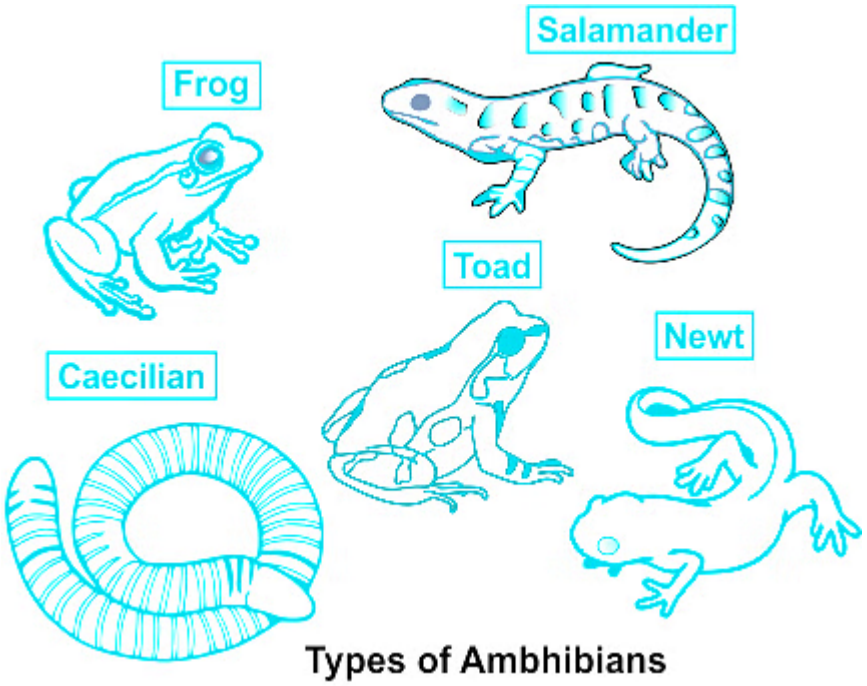
The correct answer is **Amphibian**.

- **Amphibian** classes, animals lack scales and have mucous **glands** in the **skin** .

⭐ **Key Points**

- **Amphibians** are **cold-blooded vertebrates** (vertebrates have backbones) that don't have **scales.** They live part of their lives in **water** and **part on land.**
- These animals are born with **gills** , and while some outgrow them as they transform into **adults** , others retain them for their **entire lives.**
- **Amphibians** are the most threatened class of **animals** in **nature** . They are extremely **susceptible** to environmental threats because of their **porous eggs** and **semipermeable skin.**

⭐ **Additional Information**



Types of Ambhibians

★ Important Points

Name	Details
Reptiles	• Reptiles, as most commonly defined, are the animals in the class Reptilia, a paraphyletic grouping comprising all amniotes except synapsids and Aves. • Reptiles are air-breathing, cold-blooded vertebrates that have scaly bodies rather than hair or feathers.
Fish	• Fishes are a group of animals that are completely aquatic vertebrates that have gills, scales, swim bladders to float, most produce eggs, and are ectothermic. • Sharks, stingrays, skates, eels, puffers, seahorses, clownfish are all examples of fishes.
Aves	• Birds are a group of warm-blooded vertebrates constituting the class Aves. • Birds are vertebrates with feathers, modified for flight and for active metabolism. • Birds are a monophyletic lineage, evolved once from a common ancestor, and all birds are related through that common origin.

52. **Answer: d**

Explanation:

Given:

CP of first article = Rs. 200

CP of second article = Rs. 600

SP of both article = Rs. 300

Profit on first article = 30%

Formula used:

Profit = SP – CP

Profit% = Profit/CP × 100

Calculation:

According to the question

Profit% on first article = Rs. (200 × 30/100)

⇒ Rs. 60

Profit on second article = (300 – 60)

⇒ Rs. 240

Now,

Profit% = (240/600 × 100)

⇒ 40%

∴ Required profit percentage on the second article is 40%

---

53. Answer: c

Explanation:

The correct answer is Telangana.

⭐ Key Points

- The **Manjira Crocodile Wildlife Sanctuary** is situated in **Medak district Telangana state.**
  - The **Manjira sanctuary** is situated along the mighty river **Manjeera** .
  - The **Manjira sanctuary** was **established** in **June 1978** .

- In **1974,** the **mugger crocodile** had reached the threshold of extinction in **Telangana** , with only **four pairs** of mugger crocodiles remaining in the **Manjira wildlife sanctuary.**
- Today there are approximately **400 to 600 crocodiles** in the **sanctuary** helped by a **crocodile breeding program** that is carried out here.

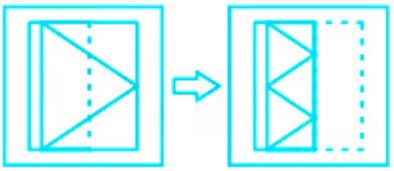
⭐ Additional Information

State Name	Details
Tamil Nadu	• Tamil Nadu, a South Indian state, is famed for its Dravidian-style Hindu temples. • The Tamil Nadu state capital is Chennai. • During the 4th to 8th centuries, Tamil Nadu saw the rise of the Pallava dynasty under Mahendravarman I and his son Mamalla Narasimhavarman I. • As of now, Tamil Nadu Chief Minister is M K Stalin.
Odisha	• Odisha, an eastern Indian state on the Bay of Bengal, is known for its tribal cultures and its many ancient Hindu temples. • The capital of Odisha is Bhubaneshwar. • As of now, Odisha's chief minister is Naveen Patnaik.
Telangana	• Telangana is a state in southern India. • The capital of Telangana is Hyderabad. • Telangana, as a geographical and political entity, was born on June 2, 2014, as the 29th and the youngest state in the Union of India. • As of now, The Telangana chief minister is K. Chandrashekar Rao.
Kerala	• Kerala, a state on India's tropical Malabar Coast. • The capital of Kerala is Thiruvananthapuram. • As of now, the chief minister of Kerala is Pinarayi Vijayan. • The island of Dharmadom near Kannur, along with Thalassery, was ceded to the East India Company in 1734.

54. **Answer: b**

Explanation:

When it is folded on the dotted line, pattern will be the same as that of the transparent sheet given below:-



Hence, **"option 2"** is the correct answer.

---

55. **Answer: a**

Explanation:

The logic followed here is:-

Enough is the synonym of contentment.

Similarly,

Feel is the synonym of sense.

Hence, **"option 1"** is the correct answer.

---

56. **Answer: a**

Explanation:

The correct answer is 1420.

⭐ Key Points

- **Niccolo Conti** visited **Vijayanagara** in **1420 AD** during the reign of Devaraya I.
- **Niccolo Conti** was an **Italian merchant, explorer,** and **writer** . Born in **Chioggia** , he traveled to **India** and **Southeast Asia** , and possibly to **Southern China** , during the early **15th century.**
- The **first printed edition** of **de' Conti's** account was made in **1492** in the original **Latin** by **Cristoforo da Bollate** and dedicated to **Pietro Cara** , who was going on a **journey to India.**

⭐ Additional Information

- **Vijayanagara Empire:**
  - The **Vijayanagara Empire** was **founded** by Harihara and **Bukka** and the reign was from **1336 A.D** to **1646 A.D.**
  - The V **ijayanagar empire'** s capital city was **Hampi.**
- **Vijayanagar Empire was ruled by four important dynasties and they are:**
  - Sangama.
  - Saluva.
  - Tuluva.
  - Aravidu.

⭐ Important Points

- **Temples Built during Vijaynagara Empire are:**

Temple Name	Location	Details
Ganagitti (Jain)	Hampi	• Built-in 1385 AD • An inscription on the site states that the temple was built by Iruga, in the reign of King Harihara II, a UNESCO World Heritage site.
Chandranath (Jain)	Mudabidri	• Built-in 1429–1430 AD. • Known locally as the 1000-pillared temple.
Temple tank (Pushkarni)	Hampi	• Built-in 16th century AD. • Stepped temple tank in Hoysala style, UNESCO World Heritage site.
Bahubali monolith (Jain)	Karkala	• Built in 1581 AD. • The Basadi is also called Ratnatraya Badasi and was built by Rangapparajodeya. It has shrines for Neminatha, Parsvanatha, and Vardhamana.
Kollur Mookambika	Kollur	• Built-in 1484 AD. • The temples were built by Hadavalli prince Salvendra

57. **Answer: b**

Explanation:

The correct answer is**Magnesium Hydroxide**.

- **Magnesium Hydroxide** is used as an **Antacid.**

⭐ Key Points

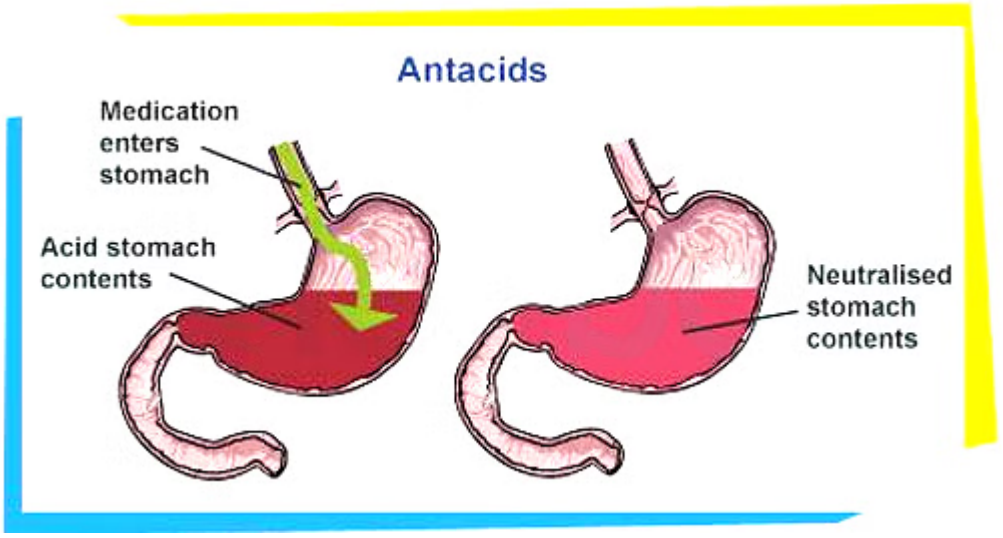
- An **antacid** is a substance which **neutralizes stomach acidity** and is used to relieve **heartburn, indigestion,** or an **upset stomach** .
- Some antacids have been used in the **treatment** of **constipation** and **diarrhea** .
- Antacids are **over-the-counter** (OTC) medications that help **neutralize stomach acid.**
- They work differently from other acid reducers such as **H2 receptor blockers** and **proton pump inhibitors** (PPIs). Those drugs work by reducing or preventing the secretion of **stomach acid.**

⭐ Additional Information

- Antacids can be used to treat symptoms of excess stomach acid, such as:
  - Acid reflux: which can include regurgitation, bitter taste, persistent dry cough, pain when lying down, and trouble swallowing.
  - Heartburn: which is a burning sensation in your chest or throat caused by acid reflux.
  - Indigestion: which is a pain in your upper gut that can feel like gas or bloating.

⭐ Important Points

- Antacids usually come in the following drug forms:
  - Liquid.
  - Chewable gummy or tablet.
  - A tablet that you dissolve in water to drink.



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58. **Answer: d**

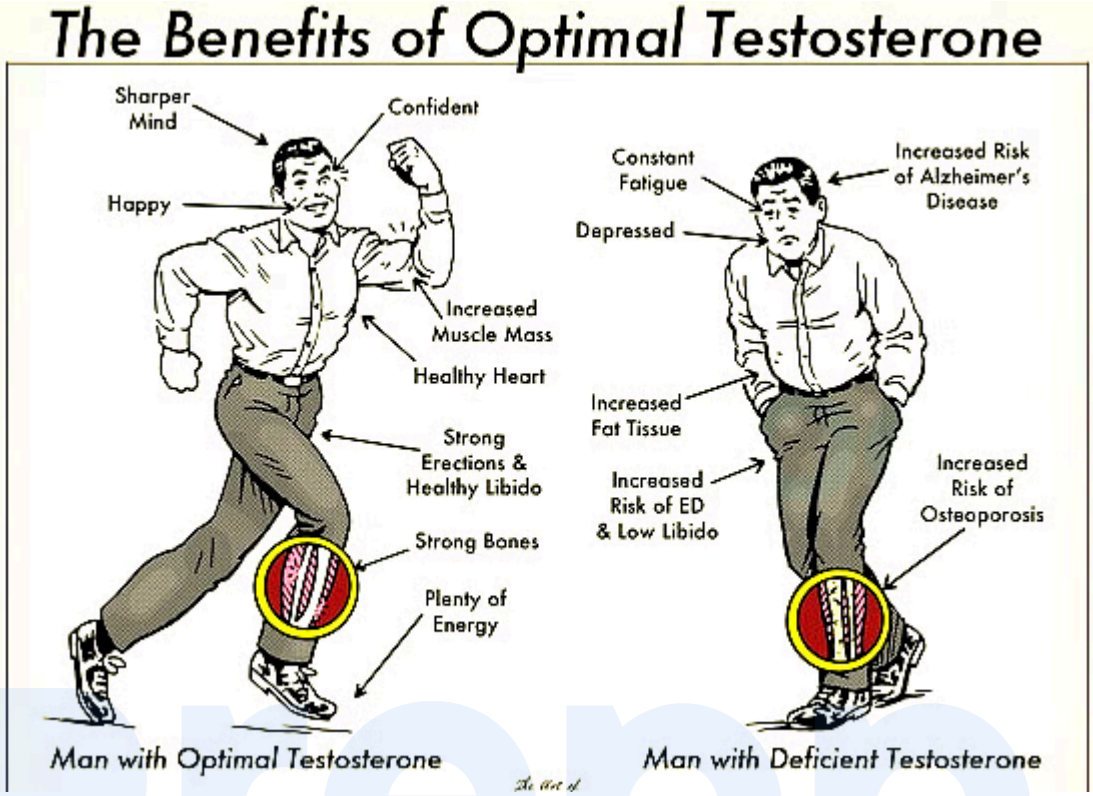
Explanation:

The correct answer is Testosterone.

- **Testosterone** causes changes in the appearance seen in boys at the time of **puberty.**
- **Puberty** is the process of **physical changes** through which a **child's body matures** into an **adult body** capable of **sexual reproduction.**

⭐ Key Points

- For guys, these **hormones** travel through the **blood** and give the **testes** the signal to begin the production of **testosterone** and **sperm** .
- **Testosterone** is the **hormone** that causes most of the **changes** in a **guy's body during puberty** .
- **Sex hormones** are chemical substances produced by **sex organs.**
    - **For example,** Testosterone is the male sex hormone produced by the testis, and estrogen is the female sex hormone produced by the ovary. These hormones affect the sexual features of an organism.



⭐ Additional Information

- **Functions of sex hormones:**
  - **Testosterone:** This hormone brings about secondary sex characters in boys such as the growth of a beard, the voice becoming hoarse, development of reproductive organs, etc.
  - **Oestrogen:** This hormone is responsible for the development of secondary sexual characters in females such as the enlargement of breasts, development of female reproductive organs, etc.

⭐ Important Points

Name	Details
Prolactin	• Prolactin, also known as lactotroph, is a protein best known for its role in enabling mammals, usually females, to produce milk. • It is influential in over 300 separate processes in various vertebrates, including humans.
Adrenaline	• Adrenaline, also known as epinephrine, is a hormone and medication which is involved in regulating visceral functions. • Adrenaline is normally produced both by the adrenal glands and by a small number of neurons in the medulla oblongata.
Estrogen	• Estrogen is a kind of hormone that has an important role in the health of women. • There are 3 types of estrogen: estrone, estradiol, and estriol. • They affect the sexual and reproductive development in girls and women. The ovaries make most of the estrogen in your body.

59. **Answer: d**

Explanation:

The correct answer is **Ohm**.

- The **SI unit** of resistance is **Ohm.**

⭐ **Key Points**

- **Resistance** is a measure of the opposition to current flow in an **electrical circuit.**
- **Resistance** is measured in **ohms** , symbolized by the **Greek letter omega** (Ω).

- **Ohms** are named after **Georg Simon Ohm** (1784-1854), a **German physicist** who studied the relationship between **voltage, current, and resistance.**
- **The resistance formula is as follows:**
    - Resistance = voltage drop across a resistor/ current flowing through a resistor. R = \frac{V}{I} R = resistance (Ohms, Ω).

⭐ **Additional Information**

Unit	Details
Ampere	• The ampere, often shortened to amp, is the base unit of electric current in the International System of Units. • It is named after Andre-Marie Ampere, French mathematician and physicist, considered the father of electromagnetism along with the Danish physicist Hans Christian Qrsted.
Coulomb	• coulomb, unit of electric charge in the meter-kilogram-second-ampere system, the basis of the SI system of physical units. • It is abbreviated as C. • The coulomb is defined as the quantity of electricity transported in one second by a current of one ampere.
Volt	• The volt (symbolized V) is the Standard International (SI) unit of electric potential or electromotive force. • Voltages are sometimes expressed in units representing power-of-10 multiples or fractions of one volt. • A kilovolt (symbolized kV) is equal to one thousand volts (1 kV = 103 V).

---

60. **Answer: a**

Explanation:

The correct answer is **13.5 Mole**.

- **13.50 Moles** are present in **54g of He.**

⭐ **Key Points**

- A number of grams of **Helium (He) = 54 gm.**
- Molecular mass is the sum of total protons and neutrons.
- The molecular mass of Helium = **2 x 2 = 4.**
- Now multiply the mass with a number of elements we get = **4 x 1 = 4.**
- One mole is equal to the total mass of the molecule.
- We know one mole is equal to 4 gm of Glucose molecule.
- Now a number of moles in 54 gm of Helium is (n) = 54/4 n = 13.5 moles.
- The number of moles in **54 gm is 13.5 moles.**

⭐ **Additional Information**

- **Helium** is a **chemical element** with the symbol **He** and atomic number **2.**
- It is a **colorless, odorless, tasteless, non-toxic, inert, monatomic gas,** the **first** in the **noble gas group** in the **periodic table** .
- Its **boiling** and **melting point** are the **lowest** among **all the elements** .

---

61. **Answer: c**

Explanation:

The correct answer is **100 J**.

⭐ **Key Points**

- If
  - Force = **10 N** and
  - distance = **10 m**
  - then the work done by the force will be **100 J** .
    - Here the unit of work is Newton- metre (Nm) or joule (J).
    - 100 Joule is the amount of work done on an object when a force of 10 N replaces it by 10 metre with the line of action of the force.

- The work done by a force can be either zero or negative or positive.
- Hence, 100 Joule is the amount of work done when a body moves under a force of in a distance of 10 metre in the direction of the force.

---

62. Answer: c

Explanation:

The correct answer is **99%**.

- **99%** of the share of **Government of India** in **NABARD.**

⭐ Key Points

- The **Committee** was formed on **30 March 1979,** under the Chairmanship of **Shri B. Sivaraman** , a former member of the **Planning Commission, Government of India.**
- **National Bank For Agriculture & Rural Development (NABARD)** is set up as an apex **Development Bank** by the **Government of India** with a mandate for facilitating credit flow for promotion and development of **agriculture, cottage,** and **village industries.**
- The **NABARD** its headquarters is located in **Mumbai.** And its agency executive (Chairperson) is **Harsh Kumar Bhanwala** .

⭐ Additional Information

- Key Achievements of NABARD are:
  - Provision of refinances support.
  - Improving rural infrastructure.
  - Preparation of credit plans at a district level and encouraging banks to achieve these targets.
  - Supervision of Regional Rural Banks (RRBs) and Cooperative Banks.
  - Development of sound banking practices within the economically backward sections of India.
  - NABARD has designed the Kisan Credit Card that has benefitted crores of farmers in the country.

63. **Answer: a**

Explanation:

Given:

Speed of first train = 2 km/h

Speed of second train = 4 km/h

Time taken to overtake the first person = 9 sec

Time taken to overtake the second person = 10 sec

Formula used:

If train running in same direction = (x – y) km/h

Speed = Distance / Time

Km/h × 5/18 = m/sec

Calculation:

Let the length of train be L

According to the question

Speed of first person is

⇒ 9 = L/(x – 2 × 5/18) .....(1)

Speed of second person is

⇒ 10 = L/(x – 4 × 5/18) .....(2)

Now, substituting the equation (1) and (2) we get,

⇒ 9/10 = (x – 4)/(x – 2)

⇒ 9x – 18 = 10x – 40

⇒ x = (40 – 18)

⇒ x = 22 km/h

Now,

Putting the value of x in equation (1)

⇒ 9 = L/(22 – 2 × 5/18)

⇒ 9 = L/(20 × 5/18)

⇒ 9 = L/(100/18) m

⇒ 9 = L/(50/9)

⇒ 9 = 9L/50

⇒ 9L = (50 × 9)

⇒ L = (50 × 9)/9

⇒ L = 50 m

∴ The required value is 22 km/h and 50 m

---

64. Answer: c

Explanation:

The statement highlights the problem of wide-ranged cheating in colleges and its effect.

- The statement suggests that copying in colleges has resulted in poor quality of students at the higher education level. This implies that such malpractices have an effect on the quality of students opting for higher education. Thus, conclusion I follows.

- The statement implies how **students in higher education** are of poor quality and **represent the colleges** where copying is rampant. So, it is possible that some students from such colleges have opted for higher education. Thus, Conclusion II also follows.

Hence the correct answer is **option 3** .

---

65. Answer: a

Explanation:

Given:

Total parts = Rs. 6600

R_1 = 10%

T_1 = 3 years

R_2 = 9%

T_2 = 4 Years

Formula used:

SI = (P × R × T)/100

Calculation:

Let the two parts be x and 6600 – x

According to the question

⇒ (x × 10 × 3)/100 = (6600 – x × 9 × 4)/100

⇒ 5x = 39600 – 6x

⇒ 11x = 39600

⇒ x = Rs. 3600

Now,

second part = Rs. (6600 – 3600) = Rs. 3000

∴ The required parts is Rs. 3600 and Rs. 3000

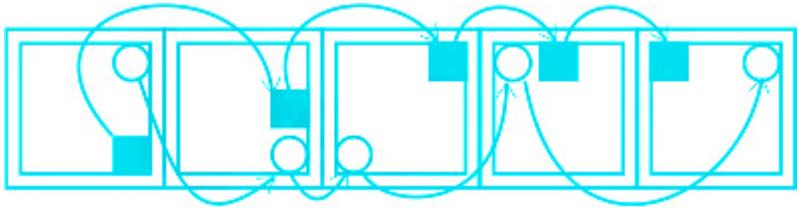
---

66. Answer: a

Explanation:

The logic followed here is:-

- The circle moves in the clockwise direction
  - top right to bottom right ,
  - then bottom right to bottom left,
  - then bottom left to top left and
  - then top left to t op right .
- The square moves in the anticlockwise direction
  - bottom right to middle right,
  - then middle right to top right,
  - then top right to top middle and
  - top middle to top left.



Hence, **"option 1"** is the correct answer.

---

67. Answer: d

Explanation:

The correct answer is **Sheffield Football Club**

- The **first football club** in the **world** , which was established in **England** in **1857** , was **Sheffield Football Club.**

⭐ Key Points

- Two members, **Nathaniel Creswick** and **William Prest** formed the **Sheffield Football Club.**
- The **inaugural meeting** of the club took place on **24 October 1857** at **Parkfield House** in the suburb of Highfield in **Sheffield** .
- Creswick and Prest were responsible for drawing up the **club's rules of play** , which were decided upon at the **club's AGM** on **21 October 1858,** and published the following year.
- On **2 January 1865** , the club played its **first fixture** outside **Sheffield** against Nottingham playing eighteen-a-side under **Nottingham Rules.**

⭐ Additional Information

Club Name	Details
Huddersfield Football Club	• Huddersfield Town Association Football Club is an English professional football club based in Huddersfield, West Yorkshire. • It was founded on 15 August 1908, it entered the Football League in 1910.
Manchester United Football	• Manchester United Football Club is a professional football club based in Old Trafford, Greater Manchester, England. • The club was founded in 1878, Newton Heath, Manchester, United Kingdom. • The club founders are Lancashire and Yorkshire Railway.
Chelsea Football Club	• Chelsea Football Club is an English professional football club based in Fulham, West London. • It was founded in 1905, the club competes in the Premier League, the top division of English football. • Club founders are Gus Mears, Joseph Mears.

68. **Answer: d**

Explanation:

The correct answer is **78°C**.

- The boiling point of ethanol is**78°C.**

⭐ **Key Points**

- **Ethanol** is a **renewable fuel** made from **corn** and other **plant materials.**

- The most common blend of ethanol is **E10** (10% ethanol, 90% gasoline).
- **Ethanol** is also available as **E85** (or flex fuel) a high-level ethanol blend containing **51% to 83% ethanol,** depending on geography and season for use in **flexible fuel vehicles** .
- It is simple alcohol with the **chemical formula C_2H_6O** . Its formula can be also written as **CH_3-CH_2-OH or C_2H_5OH** and is often abbreviated as EtOH.

⭐ Additional Information

---

69. **Answer: d**

Explanation:

Given:

LCM = 68

HCF = 5

One number = 20

Formula used:

LCM × HCF = one number × other number

Calculation:

Let the other number be x

According to the question

⇒ (68 × 5) = 20 × x

⇒ x = (68 × 5)/20

⇒ x = 17

∴ **The other number is 17**

70. **Answer: b**

Explanation:

The correct answer is **15 January**.

- On **15th January** the **National Army Day** was observed in **India.**

⭐ **Key Points**

- **Army Day** is celebrated on **15 January every year** in **India** , in recognition of **Field Marshal Kodandera M.**
- On **15 January 2021** , India celebrated its **73rd Indian Army Day** in **New Delhi.**
- **Gallantry awards** and **Sena medals** are also **awarded** on this **day** .

⭐ **Additional Information**

- The **Indian Army** was **founded** almost **126 years ago** by the **British** on **April 1, 1895.**
- The **Indian army** was established on **1st April** , but **Army Day** in **India** is **celebrated** on **15th January** .
- **Field Marshal K. M. Cariappa** became the **first Indian Army** Chief of **Independent India** on **15 January 1949.**
- The **transfer of power** of the army in the hands of an **Indian citizen** on **15 January** is marked as **Army day** in the **country.**
- **Cariappa** led the **Indian Army** on the **western border** in the **Indo-Pak war** in **1947** .

71. **Answer: d**

Explanation:

Given:

5 : 9 : : x : 27

Calculation:

5 : 9 : : x : 27

⇒ 5/9 = x/27

⇒ 9x = 135

⇒ x = 135/9

⇒ x = 15

∴ The required value of x is 15

---

72. Answer: c

Explanation:

The correct answer is **8V**.

- Let the **volume** of a **cube** be V. **8V** will be the **volume** if its side is **doubled.**

⭐ **Key Points**

- I f the **length** of the **cube** is **doubled** then its **volume** is **increased** by **8 times.**
- **Solution:**
  - Let the original side be a cm. Then, original volume = a^3 cm ^{3}.
  - **New side = 2a cm. So, new volume =$(2a)^3$cm ^{3}=$(8a^3)$cm ^{3}.**
  - So, the volume becomes 8 times.

⭐ **Additional Information**

- A **cube** is a region of space formed by **six identical square faces** joined along their **edges** .
- **Three edges** join at **each corner** to form a vertex. The **cube** can also be called a **regular hexahedron.**
- It is **one** of the **five regular polyhedrons** , which are also sometimes referred to as the **Platonic solids.**

73. **Answer: b**

Explanation:

The statement makes a suggestion to walk barefoot on grass, highlighting that it is good for health.

- Argument I agrees to this point and further adds that walking on grass is good because it gives energy from the earth. It points out the benefits. Thus, Argument I is strong.
- Argument II disagrees with the given statement, but it does not make a valid point to justify the disagreement. Having other ways to create good health need not imply that we need to reject this way. Thus, argument II is not strong.

Hence the correct answer is **option 2** .

---

74. **Answer: b**

Explanation:

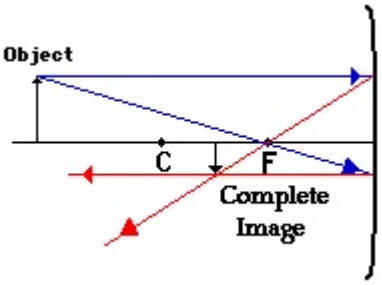
The correct answer is **Beyond C.**

⭐ **Key Points**

- A concave mirror is a type of spherical mirror in which, the **reflecting surface is the inner curved surface of the sphere.**
  - The incident light is reflected inwards because of its shape. Thus, such mirrors are also called converging mirrors.
- A concave mirror forms different images which depend on the distance between the object and the mirror.
- In a concave mirror, the object should be placed beyond C to obtain a real inverted and smaller image between C and F.

⭐ **Additional Information**

- Ray diagram:



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75. Answer: a

Explanation:

Given:

30% number is more than 240

Calculation:

According to the question

⇒240 + (240 × 30/100)

⇒ 240 + 72

⇒ 312

∴ The required number is 312

---

76. Answer: a

Explanation:

The logic followed here is:-

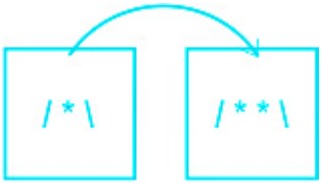
One line became two line which is given below:-

Two lines became one line and one star which is given below:-

one line and one star became two lines and one star which is given below:-

Two lines and one star became one line and two stars which is given below:-

One line and two stars became two lines and two stars which is given below:-



Hence, **"option 1"** is the correct answer.

---

77. **Answer: c**

Explanation:

The correct answer is **Santoor**.

- **Santoor** is known as **Shattantri Veena** in **Sanskrit** text and has **72 strings** .

⭐ Key Points

- The **santoo** r is a **trapezoid-shaped** hammered **dulcimer** or **string musical instrument** made of **walnut** , with **seventy-two strings.**
- It is the **national musical instrument** of **Iran** and is also native to **Jammu and Kashmir.**
- It dates back to ancient times and was called **Shatha Tantri Veena** in ancient **Sanskrit texts.**
- A primitive ancestor of this type of instrument was used in **Mesopotamia** (1600-911 BC) and **Babylonia.**

⭐ Additional Information

⭐ Important Points

Instrument Name	Details
Khanjari	• The khanjari is a small frame drum of southern India that has a single set of jingles. • A circular frame over one edge of which a circular piece of skin is stretched and glued. • It is a drum-like instrument, usually made of neem or jackfruit wood, one side of which is covered with animal membrane, while the other side is left uncovered.
Sarood	• The sarod is a stringed instrument, used mainly in Hindustani music on the Indian subcontinent. • The design of the Sarood instrument depends on the school (Gharana) of playing. • The design of this early model is generally credited to Niyamatullah Khan of the Lucknow Gharana as well as Ghulam Ali Khan of the Gwalior-Bangash Gharana.
Sitar	• The sitar is a plucked stringed instrument, originating from the Indian subcontinent, used in Hindustani classical music. • The instrument was invented in medieval India and flourished in the 16th and 17th centuries and arrived at its present form in 18th-century India.

78. **Answer: b**

Explanation:

The correct answer is **33**.

- The electronic configuration of an element is **1s 2 2s 2 2p 6 3s 2 3p 3.** 33 will be the **atomic number of the element** just below the said element in the periodic table.

⭐ Key Points

- The **electron configuration** is the distribution of electrons of an atom or molecule in **atomic or molecular orbitals.**
- The atomic number of the above element is **2+2+6+2+3 =15** .
- The atomic number of the element below the given element is **15+18 =33.**

---

79. Answer: a

Explanation:

The correct answer is **Nidhi Chanani**.

- The author of **Pashmina** , the compassionate story of an Indian American girl was **Nidhi Chanani.**

⭐ Key Points

- **Nidhi Chanani** was born in **1980** in **Kolkata** .
- Her debut graphic novel **Pashmina** was released by **First Second Books** in **October 2017.**
- **Awards of Nidhi Chanani are:**
  - In 2012 **White House Champion of Change.**
  - In 2017 **Virginia Library Association Graphic novel Diversity Award in the youth category.**
  - In 2018 **South Asia Book Award Honor (Grade 3-6).**

⭐ Additional Information

Person Name	Details	Famous Book
Diksha Basu	• Diksha Basu is an Indian American writer and actor. • Her debut novel Opening Night was published by HarperCollins and launched in 2012 by Chetan Bhagat.	• Opening Night (2012). • The Windfall (2017). • Destination Wedding (2020).
Roshani Chokshi	• Roshani Chokshi is an American children's book author and a New York Times bestselling author. • She was born on 14 February 1991, St. Louis, Missouri, United States.	• The Gilded Wolves. • Aru Shah and the Song of Death. • A Crown of Wishes.

80. **Answer: a**

Explanation:

Calculation:

$\Rightarrow \sqrt{1296} = (?)^2$

$\Rightarrow 36 = (?)^2$

$\Rightarrow 6 = ?$

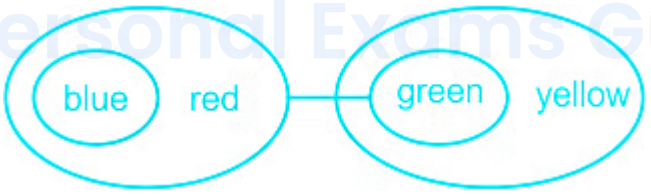
∴ The value of ? is 6

81. **Answer: a**

Explanation:

Statement	Conclusion		
	Definite (100% true)	Can't Say	Incorrect (100% false)
All A are B 	Some A are B Some B are A	Some B are not A All B are A	Some A are not B No A is B No B is A
Some A are B 	Some B are A	Some A are not B All B are A Some B are not A All A are B	No A is B No B is A
No A is B 	No B is A Some A are not B Some B are not A		Some A are B Some b are A All A are B All B are A
Some A are not B 		Some B are not A Some A are B Some B are A All B are A No A is B No B is A	All A are B

The least possible Venn diagram is as follows:

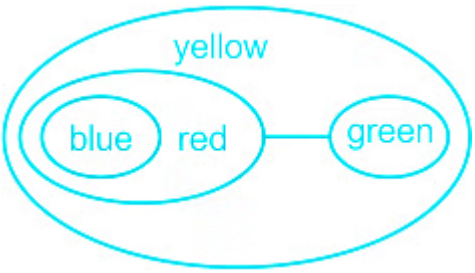


Conclusion:

I. All blue being yellow is a possibility. → True (All blue is red, no red is green, all green are yellow then we can say that a ll blue being yellow is a possibility is true.)

The possibility diagram is as follows:

- here we can see that all blue can be yellow



II. No blue is yellow. → False (it is possible but not definite .)

Hence, **"option 1"** is the correct answer.

---

82. Answer: c

Explanation:

The correct answer is Hydra.

⭐ Key Points

- Hydra can reproduce by the process of regeneration and budding.
  - Hydra is a small freshwater organism . They are native to temperate and tropical regions.
  - When the food is plentiful the asexual reproduction occurs in hydra.
  - The process is done by producing buds in the body wall. It grows as a mini form of adult and breaks apart when gets mature.
  - Hydra goes through tissue regeneration when injured. If the hydra is cut in half, each part will regenerate as a whole new hydra. This regeneration occurs without the cell division process.

⭐ Additional Information

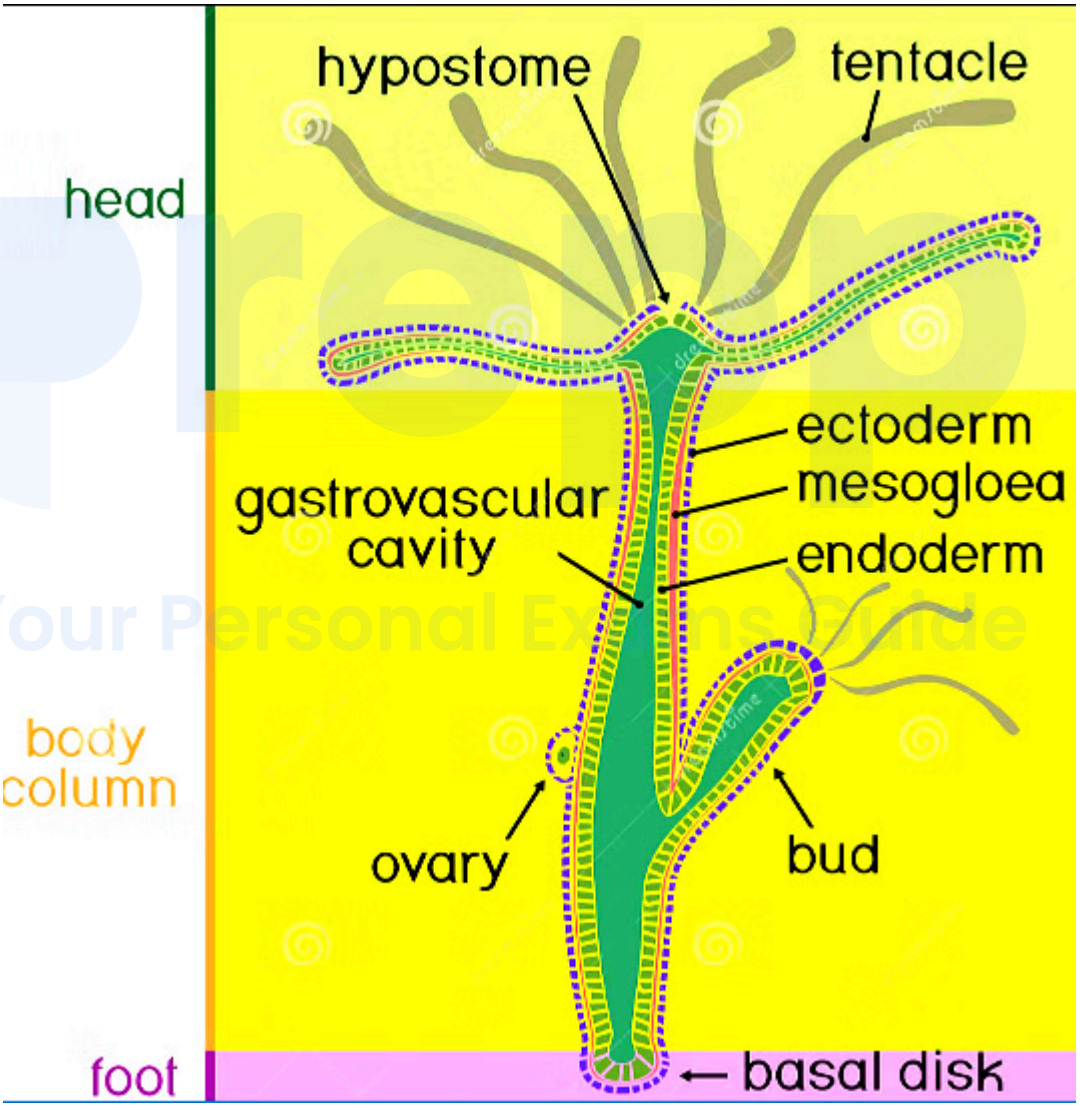
- Yeast:
  - While most yeasts reproduce by budding, some also reproduce by fission.
- Plasmodium:
  - Plasmodium reproduces both by sexual and asexual methods.
- Planaria:

- Planaria reproduces by methods like fragmentation and spontaneous dropping tails.

- Amoeba:
  - An amoeba often called an amoeboid, is a type of cell or unicellular organism which has the ability to alter its shape, primarily by extending and retracting pseudopods.

⭐ **Important Points**

Structure of Hydra:



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83. Answer: c

Explanation:

The correct answer is **Only statements B and C are true.**

⭐ **Key Points**

- The value of **'g'** on **Mount Everest** is **<g** :
  - value of acceleration due to gravity on mount Everest is **<g** .
  - Explanation: As we move above and below the surface of the earth, acceleration due to **gravity decreases.**

⭐ **Additional Information**

- **A ball thrown vertically comes back to the ground after 15 seconds. Its velocity is 150 m/s.**
- **Time to reach Maximum height:**
  - t = 15/2 = 7.5 s.
  - v = 0 (at the maximum height)
  - a = − 9.8 m s^{-2}
  - Since the ball is thrown upwards, the acceleration is negative.
- **Velocity:**
  - Using, v = u + at, we get
  - 0 = u − 9.8 × 7.5
  - or, u = 73.5 ms^{-1}
  - Thus, the velocity with which it was thrown up = 73.5ms^{-1}
- **Maximum height it reaches:**
  - Using, 2aS = $v^2 - u^2$, we get
  - S = v^2- u^2/2a
  - S = 0 − 73.5 × 73.5/(- 2× 9.8)
  - S = 276 m
  - Thus, Maximum height it reaches = 276 m.

---

84. Answer: d

Explanation:

Given:

Shalini had a piece of cake = $1/6^{th}$

Tanveer had a piece of cake = $1/4^{th}$

Calculation:

According to the question

⇒ (1 – (1/6 + 1/4))

⇒ (12 – (2 + 3))/12

⇒ 7/12

∴ Rashid's piece of cake is 7/12

---

85. Answer: d

Explanation:

The correct answer is **Pratibha Patil**.

⭐ **Key Points**

- **Pratibha Patil** is the **first woman President** of **India** .
  - She was born on **19 December 1934.**
  - She is an **Indian politician** who served as the **12th President of India** from **2007** to **2012** .
  - She is the only **woman** to hold the office of the **president of India.**
  - She previously **governed** as the **Governor of Rajasthan** from **2004 to 2007**
  - She was born in the village **Nadgaon** of **Muktainagar taluka** in the **Jalgaon district** of **Maharashtra** in **India.**

⭐ **Additional Information**

Person Name	Details
Smita Patil	• Smita Patil was born on 17 October 1955 in Pune, Bombay State, India. • Smita Patil was an actress. • In 2012, the Smita Patil International Film Festival Documentaries and Shorts were initiated in her honor. • On the occasion of 100 years of the Indian cinema, a postage stamp bearing her face was released by India Post to honor her on 3 May 2013.
Indira Gandhi	• Indira Gandhi was an Indian politician and a central figure of the Indian National Congress. • She was the 3rd prime minister of India and was also the first and, to date, only female prime minister of India. • Indira Gandhi was born on 19 November 1917, Prayagraj.

86. **Answer: b**

Explanation:

The correct answer is **Congress and JD (S) alliance**.

- As of **June 2018 Congress and JD (S) alliance** political party is in power in Karnataka.
- In **June 2018** the chief Minister of Karnataka is **H.D. Kumaraswamy.**

⭐ **Key Points**

- The **BJP** has won **104 seats** .**Congress** has won **78 seats** . The **JD(S)** has won **37 seats** and the others **3 seats.**
- In assembly, **Congress** has got **22 berths** while the **JDS** has **12 seats.**

- As of now the **chief minister of Karnataka** is **Basavaraj Bommai** from 28 July 2021.

⭐ Additional Information

- The **1st chief minister of Karnataka** in **K. Chengalaraya Reddy** served as a chief minister from **25 October 1947** to **30 March 1952.**

---

87. Answer: b

Explanation:

Concept used:

Divisibility rule of 8 - If the number formed by its last three-digit is divisible by 8.

Example - 2544, the last three digits are 544 which is divisible by 8.

Calculation:

A number is divisible by 8, its last digit = 4

∴ The last digit is 4

Note: Other rest 3 options are an odd number, 8 is an even number.

---

88. Answer: a

Explanation:

The logic followed here is:-

Big is the synonym of large.

Similarly,

Thin is the synonym of slim.

Hence, **"option 1"** is the correct answer.

---

89. Answer: d

Explanation:

Given:

LCM of 36, 27 and 72

Concept used:

LCM - The least number which is exactly divisible by two or more numbers.

Calculation:

Prime factorization of

⇒ 36 = 2 × 2 × 3 × 3

⇒ 27 = 3 × 3 × 3

⇒ 72 = 2 × 2 × 2 × 3 × 3

LCM of 36, 27 and 72 = 2 × 2 × 2 × 3 × 3 × 3

⇒ 216

∴ The required LCM is 216

---

90. Answer: a

Explanation:

Given:

Total amount = Rs. 400

Number of men = 6

Number of women = 12

Number of boys = 17

Calculation:

Let the amount given to man be x, women be y, and boys be z respectively

According to the question

⇒ 6x + 12y + 17z = 400 ...(1)

⇒ 2x = 5z ...(2)

⇒ 2y = 3z ...(3)

Substituting the value of equation 2 and 3 in equation (1) we get,

⇒ 15z + 17z + 18z = 400

⇒ 50z = 400

⇒ z = 8

So, men receive = x = (5/2)z = (5/2 × 8) = 20

Boys receive = z = 8

Women receive = y = (3/2)z = (3/2 × 8) = 12

Total amount = Rs. (20 + 8 + 12)

⇒ Rs. 40

∴ Required amount is Rs. 40

---

91. Answer: d

Explanation:

The correct answer is **2007**.

- **Viswanathan Anand** was awarded **Padma Vibhushan** in the year **2007** .

⭐ Key Points

- **Viswanathan Anand** was the undisputed **World Champion** from **2007-2013** and is one of the greatest talents the game has ever known.
- **Viswanathan Anand** was born on **11 December 1969** in **Chennai, Tamil Nadu, India.**
- In **April 2006** ,**Anand** became the **fourth player** in history to pass the **2800 Elo mark** on the **FIDE rating list** , after **Kramnik, Topalov, and Garry Kasparov.**
- He **won** the **FIDE World Rapid Chess Championship** in **2003** and 2017, the W **orld Blitz Cup** in **2000** .

⭐ Additional Information

- **Chess** is a **board game** played between **two players.**
- The current form of the game emerged in **Southern Europe** during the **second half** of the **15th century** after evolving from a similar, much older game of **Indian origin** .
- When a king is under **immediate attack,** it is said to be in **check** . A move in **response** to a **check** is legal only if it results in a position where the king is **no longer in check** .

⭐ Important Points

Viswanathan Anand Awards	
Award Name	**Year**
Chess Oscar	2004, 2007 and 2008
Padma Bhushan	2001
Padma Shri	1988
Arjuna Award for Chess	1985
CNN-IBN Indian of the Year in Sports	2007 and 2012

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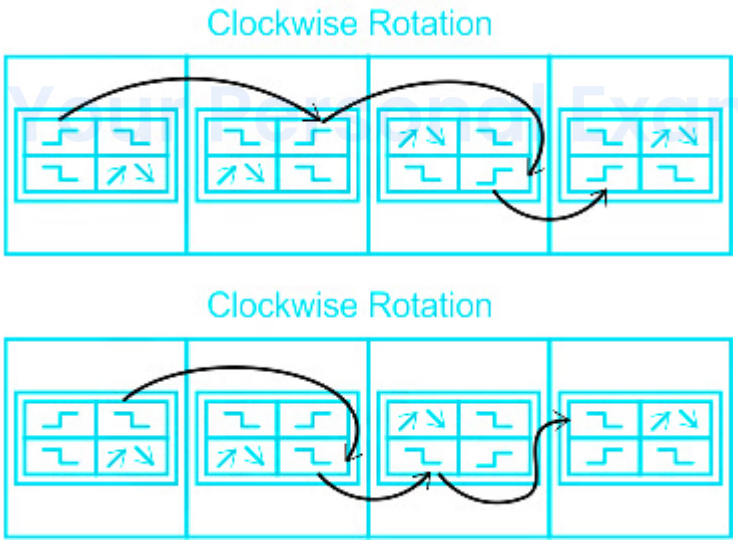
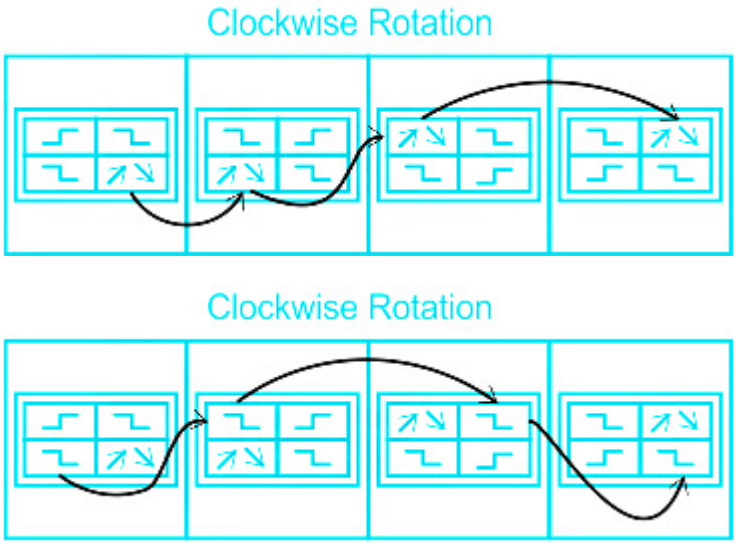
92. Answer: d

Explanation:

The logic followed here is:-

- The elements are moving in the clockwise direction.





Hence, **"option 4"** is the correct answer.

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93. Answer: c

Explanation:

Calculation:

According to the question

By statement I. - There are 32 boys and 28 girls in the school.

By statement II. - Only boys play cricket.

By statement I and II we can say that there are 32 boys who plays cricket.

∴ Both the statements I and II together are sufficient.

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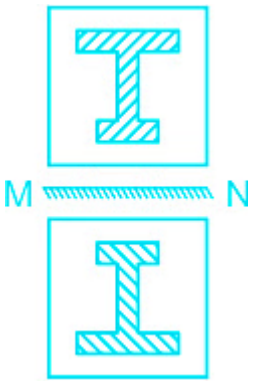
94. Answer: d

Explanation:

The mirror image for the given figure is below:-



Hence, **"option 4"** is the correct answer.

---

95. Answer: d

Explanation:

The correct answer is **Between second to 13(3-12)**.

- **Between second to 13(3-12)** are the elements of the **D block found** in the **Periodic Table.**

⭐ **Key Points**

- The **d-block elements** are found in **groups 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12** of the **periodic table,** d-block elements are also known as the **transition metals** .
- The **d orbital** is filled with the electronic shell **n-1.**
- D block elements are the elements that can be found from the third group to the twelfth group of the modern periodic table.

⭐ **Additional Information**

- **There are four series in the d block corresponding to the filling up of 3d, 4d, 5d, or 6d orbitals.**
  - 3d- Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn.
  - 4d- Y, Zr, Nb, Mo, Tc, Ru, Rh, Pd, Ag, Cd.
  - 5d- La, Hf, Ta, W, Re, Os, Ir, Pt, Au, Hg.
  - 6d- incomplete.

⭐ Important Points

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96. Answer: d

Explanation:

Given letter series:-

- ABCDEFGHIJKLMNOPQRSTUVWXYZ
- 9th letter from the right end = R
  - ABCDEFGHIJKLMNOPQ **R**STUVWXYZ
- 5th letter from the left of R = M
  - ABCDEFGHIJKL **M**NOPQRSTUVWXYZ

Hence, **"option 4"** is the correct answer.

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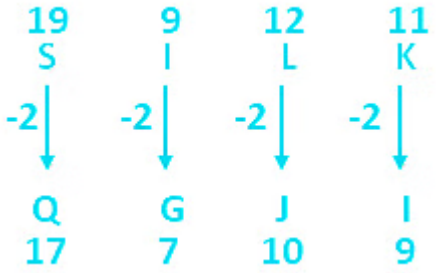
97. Answer: c

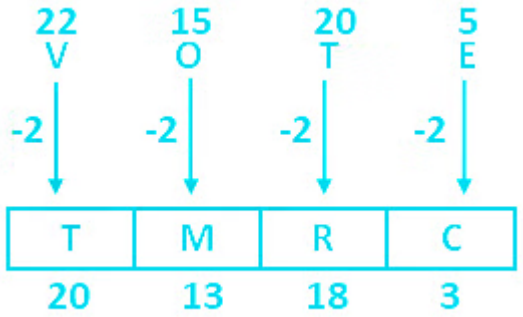
Explanation:

Alphabets	A	B	C	D	E	F	G	H	I	J	K	L	M
Positional value	1	2	3	4	5	6	7	8	9	10	11	12	13
Positional value	26	25	24	23	22	21	20	19	18	17	16	15	14
Alphabets	Z	Y	X	W	V	U	T	S	R	Q	P	O	N

The logic followed here is:-



Similarly,



Hence, **"option 3"** is the correct answer.

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98. Answer: b

Explanation:

The correct answer is **Pascal**.

- **Pascal** is not a unit of **temperature.**
- A **pascal** is a **pressure** of one newton per **square meter** , or, in **SI base units** ,**one kilogram per meter** per second squared.

⭐ **Key Points**

- **Temperature** refers to the **hotness or coldness** of a body. In specific terms, it is the way of determining the **kinetic energy** of particles within an **object.** Faster the movement of particles; more the temperature and vice versa.
- The **three** most common **temperature scales** are the **Fahrenheit, Celsius** , and **Kelvin scales** .
- **The following are a few temperature sensors besides the thermometer.**
  - Thermocouples.
  - Resistor temperature detectors.
  - Thermistors.
  - Infrared sensors.
  - Semiconductors.

Additional Information

Unit	Details
Fahrenheit	• On the Fahrenheit scale, the freezing point of water is at 32°F and the boiling point is at 212°F. • The temperature difference of one degree Celsius is greater than a temperature difference of one degree Fahrenheit. • One degree on the Celsius scale is 1.8 times larger than one degree on the Fahrenheit scale 180/100=9/5.
Celsius	• The Celsius scale has a freezing point of water as 0°C and the boiling point of water as 100°C. • The temperature difference of one degree Celsius is greater than a temperature difference of one degree Fahrenheit. • One degree on the Celsius scale is 1.8 times larger than one degree on the Fahrenheit scale 180/100=9/5.
Kelvin	• Kelvin scale is the most commonly used temperature scale in science. • The freezing and boiling points of water on this scale are 273.15 K and 373.15 K, respectively.

Important Points

Conversion	Equation
Celsius to Fahrenheit	$T_{F^o} = \frac{9}{5}T_{C^o} + 32$
Fahrenheit to Celsius	$T_{C^o} = \frac{5}{9}T_{F^o} - 32$
Celsius to Kelvin	$T_K = T_{C^o} + 273.15$
Kelvin to Celsius	$T_{C^o} = T_K - 273.15$
Fahrenheit to Kelvin	$T_K = \frac{5}{9}(T(F^0) - 32) + 273.15$
Kelvin to Fahrenheit	$T_{F^0} = \frac{9}{5}(T(K) - 273.15) + 32$

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99. **Answer: b**

Explanation:

Given:

Total profit = 20%

Cost price of each cycle = Rs. 3500

Profit% on first cycle = 5%

Formula used:

Profit = SP – CP

Profit% = Profit/CP × 100

Calculation:

According to the question

Total CP = Rs. (3500 + 3500) = Rs. 7000

Total SP = Rs. (7000 × 120/100)

⇒ Rs. 8400

Now,

SP of first cycle = Rs. (3500 × 105/100)

⇒ Rs. 3675

SP of second cycle = Rs. (8400 – 3675)

⇒ Rs. 4725

Profit = Rs. (4725 – 3500)

⇒ Rs. 1225

Profit% = (1225/3500 × 100)

⇒ 35%

∴ Required profit percentage on second cycle is 35%

---

100. Answer: b

Explanation:

Given:

A steel rod cut into three equal pieces = $40\frac{3}{5}$

Calculation:

A steel rod cut into three pieces = 203/5

Then,

Length of each piece = (1/3 × 203/5)

⇒ 203/15

⇒ $13\frac{8}{15}$

∴ The length of the each piece is $13\frac{8}{15}$