



Your Personal Exams Guide



NDA



CDS



SSC CGL



CBSE UGC NET



IAS



SSC CHSL



CTET



MPSC



AFCAT



CSIR UDC NET



IBPS PO



UP POLICE



SSC MTS



SBI PO



BPSC



UP TET



IBPS RRB



IBPS CLERK



IES



UPSC CAPF



SSC Stenogr..



RRB NTPC



SSC GD



RBI GRADE B



RBI Assistant



DSSSB

RRB Group D 2018 Previous Year Paper (11-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.

Your Personal Exams Guide

CBT

1. $23 \times 33 = 759$, then what is $0.00759 \div 3.3$? (+1, -0.33)

- a. 0.023
 - b. 0.0023
 - c. 2.3
 - d. 0.23
-

2. Identify the organization which does not belong to the given group - (+1, -0.33)

- a. UBI
 - b. SBI
 - c. PNB
 - d. ONGC
-

3. Which of the following gas is used to fill electric bulb? (+1, -0.33)

- a. H_2 and N_2
 - b. Ar and H_2
 - c. N_2 and O_2
 - d. Ar and N_2
-

4. Who has played the lead role in the movie 'Dangal' released in 2016? (+1, -0.33)

- a. Shahrukh khan
 - b. Sharman Joshi
 - c. Aamir Khan
 - d. R Madhavan
-

5. The current flowing through a resistor is inversely proportional to its ----- (+1, -0.33)

- a. Potential difference
 - b. Resistance
 - c. Electrical charge
 - d. Heat
-

6. Select the item which does not belong to the following group - (+1, -0.33)

- a. Zinc
 - b. Neon
 - c. Helium
 - d. Xenon
-

7. In a code language SPANNER is written as GCDJJBS, how will NEAR be written in that code language? (+1, -0.33)

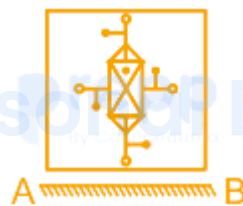
- a. JBDS

- b. DGPS
- c. JBGK
- d. BJCP

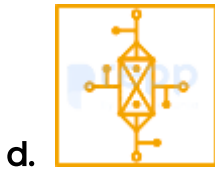
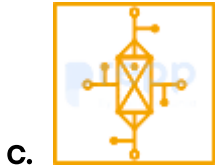
8. A car falls from a mountain road and comes to the ground in 0.8 seconds. (+1, -0.33)
(Let's say $g = 10 \text{ ms}^{-2}$). What will be its speed when it hits the ground?

- a. 5 ms^{-1}
- b. 4 ms^{-1}
- c. 01 ms^{-1}
- d. 8 ms^{-1}

9. The mirror image of the above figure with respect to the line AB is - (+1, -0.33)



- a.
- b.



10. Identify the odd one from the following -

(+1, -0.33)

$\frac{A}{1}$	$\frac{D}{4}$	$\frac{O}{15}$	$\frac{U}{23}$
A	B	C	D

a. A

b. C

c. D

d. B

11. Read the given statements and conclusions carefully and choose which of the following logically follows from the statement.

(+1, -0.33)

Statement :

I. Some tissues are weak.

II. Some weak are bones.

Conclusion :

1. Some weak are tissues.
 2. Some bones are tissues.
- a. Both conclusions 1 and 2 follow
 - b. Only conclusion 2 follows
 - c. Only conclusion 1 follows
 - d. Neither conclusion 1 nor 2 follows
-

12. The mass of an object is 10 kg. What would be its weight on earth? ($g = 10 \text{ ms}^{-2}$) (+1, -0.33)
- a. 100 Pa
 - b. 100N
 - c. 100 kg
 - d. 100 W
-

13. The formula for the mirror is - (+1, -0.33)
- a. $1/f + 1/u = 1/v$
 - b. $1/f + 1/v = 1/u$
 - c. $1/u + 1/v = 1/f$
 - d. $1/u - 1/v = 1/f$
-

14. Which of the following has a triple bond? (+1, -0.33)
-

- a. Propene
 - b. Propanol
 - c. Propanoic acid
 - d. Propyne
-

15. Who is the Executive Director and CEO of HCL? (+1, -0.33)

- a. Kiran Nadar
 - b. Shiv Nadar
 - c. Arjun Malhotra
 - d. Roshni Nadar
-

16.  (+1, -0.33)

Identify the figure which does not belong to this group -

- a. A
 - b. B
 - c. C
 - d. D
-

17. What is the measurement of the mass of an object called? (+1, -0.33)

- a. Acceleration
- b. Inertia
- c. Impulse
- d. Speed

18. Who was given the 'Best Actress' award at the Filmfare Awards 2017? (+1, -0.33)

- a. Shraddha Kapoor
- b. Alia Bhatt
- c. Anushka Sharma
- d. Deepika Padukone

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

A. Firmness: According to the type of matter, the size of a substance depends on the position of its particles. For example, solids have a fixed shape while liquids acquire their vessel shape and gases have no shape.

B. Size: This is the property of a substance in which its volume decreases under high pressure. This property is found in gases.

- a. Only A is true
- b. Both A and B are true
- c. Only B is true
- d. Both A and B are false

20. Two inlet pipes can fill a tank in 5 and 7 hours respectively. And one outlet pipe can empty this full tank in 14 hours. If all the three pipes are opened simultaneously in a completely empty tank, then in how much time will it take to fill the tank completely? **(+1, -0.33)**

- a. $4\frac{11}{13}$ hours
- b. $5\frac{11}{13}$ hours
- c. $3\frac{13}{19}$ hours
- d. $5\frac{2}{13}$ hours

21. In January 2016, All India Radio (AIR) launched a non-traditional audio broadcast channel via the Internet, which is readily available through 'Free Dish' for experts in the arts, especially classical music—both Karnataka and Hindustani. What is this channel known as? **(+1, -0.33)**

- a. Big fm
- b. Radio Mirchi
- c. Ragam
- d. Taal

22. Sunayata is facing west direction. It rotates 45° counterclockwise and 135° clockwise. In which direction is she facing now? **(+1, -0.33)**

- a. South
- b. East
- c. West

d. North

23. Two parallel chords of a circle of radius 10 cm are on the opposite sides of the center and if the chords are at distances 6 cm and 8 cm from the centers, then the difference of the lengths of the chords is (+1, -0.33)

a. 3 cm

b. 4 cm

c. 5 cm

d. 7 cm

24. A person buys land for ₹ 3 lakh. He sells 25% of it at 25% loss and 40% at 25% profit. For how much should he sell the rest of the child plot to make a total profit of 15%? (+1, -0.33)

a. ₹ 1,37,500

b. ₹ 1,38,750

c. ₹ 1,34,500

d. ₹ 1,45,000

25. Out of the _____ Upanishads, _____ Upanishads are considered to be the main - (+1, -0.33)

a. 108, 11

b. 116, 22

c. 100, 12

d. 99, 10

-
26. Below the statement are given followed by two assumptions numbered I and II. Considering the statement and assumptions, you have to decide which of the assumptions is/are implicit in the statement. (+1, -0.33)

Statement:

Ramu makes a train reservation in April to travel in May.

Assumptions:

I. Rail reservation can be done one month in advance.

II. There are many trains from Mumbai to Hyderabad.

- a. only assumption I is implicit
- b. only assumption II is implicit
- c. Neither I nor II is implicit
- d. Both I and II are implicit.

-
27. In which of the following activities do voluntary muscles work? (+1, -0.33)

- A. jumping of frogs
 - B. movement of food in the stomach
 - C. heartbeat
 - D. hand writing
- a. B and C
 - b. A, B and C

- c. A and D
 - d. Only C
-

28. The relative mass of CO is - (+1, -0.33)

- a. 28
 - b. 44
 - c. 12
 - d. 16
-

29. Medini alone can paint an entire wall in 16 days, while Yuki takes three times as long. In how many days will they paint half the wall if they work together? (+1, -0.33)

- a. 12
 - b. 3
 - c. 6
 - d. 9
-

30. What is the square root of 8281? (+1, -0.33)

- a. 81
- b. 91
- c. 89

d. 99

31. Who was appointed as the Ambassador of India to the Republic of Peru in 2017? (+1, -0.33)

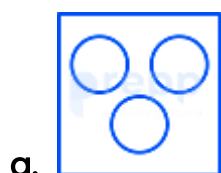
- a. M Subbaraidu
- b. Arup Kumar Saha
- c. Sandeep Chakraborty
- d. Poornima Ramakrishna

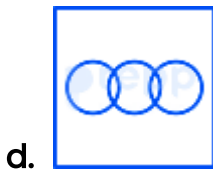
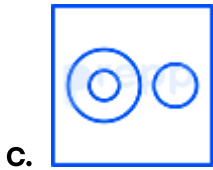
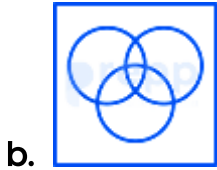
32. The circumference of a circle is 15 cm more than its diameter. Find the radius of the circle. (+1, -0.33)

- a. 7 cm
- b. 3.5 cm
- c. 4 cm
- d. 8 cm

33. Select the appropriate Venn diagram for the following words. (+1, -0.33)

shoes, grass, mobile





34. In which of the following years the Battle of Panipat was fought? (+1, -0.33)

- a. 1626
- b. 1706
- c. 1526
- d. 1500

35. What is the tenure of Lok Sabha members? (+1, -0.33)

- a. 4 Years
 - b. 3 Years
 - c. 6 Years
 - d. 5 Years
-

36. _____ has 1 to 3 electrons in its outermost shell. (+1, -0.33)

- a. Non-metal
 - b. Metal
 - c. Halogen
 - d. Metalloid
-

37. Which of the following can be produced by regeneration and budding? (+1, -0.33)

- a. Planaria
 - b. Hydra
 - c. Amoeba
 - d. Yeast
-

38. In the modern periodic table, the _____ period consists of only gasses. (+1, -0.33)

- a. 4
 - b. 1
 - c. 2
 - d. 3
-

39. For what value of p will the following equations have only one solution? (+1, -0.33)

$$2x + 3y = -5 \text{ and } 2x + py = 2$$

- a. The only value of p is 3
 - b. all values of p can be
 - c. The value of p is any number other than 3
 - d. The only value of p is 2
-

40. What is the area of the triangle with vertices $(3, 5)$, $(-2, 0)$ and $(6, 4)$? (+1, -0.33)

- a. 20 square unit
 - b. 7 square unit
 - c. 10 square unit
 - d. 14 square unit
-

41. In which district of Uttarakhand the Ministry of Drinking Water and Sanitation has launched a community-owned drinking water program 'Gangotri Swachh Iconic Place Project and Swajal'? (+1, -0.33)

- a. Pauri Garhwal
 - b. Uttarkashi
 - c. Haridwar
 - d. Udham Singh Nagar
-

42. Name the country, which became the third-largest country in terms of domestic air traffic in March 2017? (+1, -0.33)

- a. India

- b. Japan
- c. Russia
- d. England

43. Name the captain who has won three consecutive IPL titles? (+1, -0.33)

- a. Virat Kohli
- b. Mahendra Singh Dhoni
- c. Rohit Sharma
- d. Gautam Gambhir

44. The following table gives the average prices per quarter of vegetables over 2 years. In which quarter was the difference in price maximum? (+1, -0.33)

	price per kg (in ₹) year 1	price per kg (in ₹) year 2
quarter 1	36	40
quarter 2	80	80
quarter 3	65	40
quarter 4	43	40

- a. quarter 4
- b. quarter 1
- c. quarter 2
- d. quarter 3

45. _____ was awarded the Scientific and Engineering Academy Award (+1, -0.33)
at the Oscar Scientific and Technical Awards 2018 held in February 2018 in
Los Angeles, California.

- a. Vikas Sathe
- b. Vikram Sathe
- c. Vijay Sathe
- d. Vinay Sathe

46. Which is the lowest Altitude in India? (+1, -0.33)

- a. Wayanad
- b. Kuttanad
- c. Chettinad
- d. Indira Point

47. Two liquids A and B are mixed in a bucket in the ratio 7 : 5. If 9 liters of the (+1, -0.33)
mixture is replaced by 10 liters of liquid B, the ratio of both the liquids
becomes 7 : 9. How many liters of liquid A was in the bucket?

- a. 25
 - b. 22.75
 - c. 31
 - d. 21
-

48. Pointing to a photograph, Naina says, "He is the son of the only son of my maternal grandmother." To whom is she pointing? (+1, -0.33)

- a. Friend
- b. Brother
- c. Maternal Uncle
- d. Cousin

49. If $\div$ means $\times$, $\times$ means $+$, $+$ means $-$, $-$ means $\div$, then find the value of the following equation- (+1, -0.33)

$$31 \times 5 + 16 - 4 \div 92$$

- a. -300
- b. 320
- c. -332
- d. 350

50. Which of the following scientist had acquired Indian citizenship? (+1, -0.33)

- a. JBS Haldane
- b. Charles Darwin
- c. Harold C. Urey
- d. Stanley N. miller

51. Find the number of triangles in the following figure.

(+1, -0.33)



- a. 2
- b. 1
- c. 4
- d. 3

52. Mani deposits ₹ 12,500 in a bank and it becomes ₹ 15,500 in 6 years at simple interest. What is the rate of interest?

(+1, -0.33)

- a. 4%
- b. 5%
- c. 3%
- d. 6%

53. Find the next term of the following series -

(+1, -0.33)

B16, D25, F36, H49, ?

- a. K115
- b. L80
- c. J64

d. M25

54. The sum of the prime numbers between 90 to 100 will be- (+1, -0.33)

- a. 97
 - b. 198
 - c. 291
 - d. 386
-

55. A question and two statements are given. Which statement(s) is/are necessary/sufficient to answer the question. (+1, -0.33)

Question :

There are 10 bars of 2 different weights. What is their total weight?

Statement :

1. Half the weight of one fifth of 10 bars is 2 kg.
2. Of the remaining bars, one-fourth of the bar's weight is 0.5 kg.

- a. Statements 1 and 2 together are sufficient
 - b. Statement 1 alone is sufficient
 - c. Statements 1 and 2 together are not sufficient
 - d. Statement 2 alone is sufficient
-

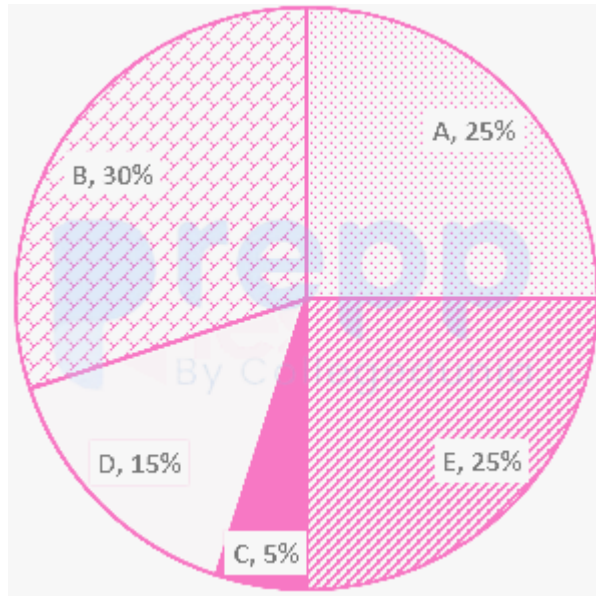
56. Which of the following is **NOT** a plantation crop? (+1, -0.33)

- a. Tea
 - b. Coffee
 - c. Cashew
 - d. Millet
-

57. Which of the following is **NOT** correct about the cerebrum? (+1, -0.33)

- a. It consists of two parts, which are called cerebral hemispheres.
 - b. It is the largest part of the brain, about 80%.
 - c. It forms the fore, apex and side of the brain
 - d. The cerebrum coordinates muscle activity.
-

58. The pie chart given below shows the information about Tire Manufacture statistics for various companies in India during the year 2017. If the total number of tires manufactured by different companies in India was 1,80,000 units in the year 2017, which company manufactured the maximum number of tyres? (+1, -0.33)

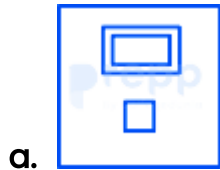


- a. D
- b. B
- c. C
- d. A

59. If $3\sqrt{5} + \sqrt{125} = 17.85$, then what is the value of $\sqrt{80} + 7\sqrt{5}$? (+1, -0.33)

- a. 33.3
- b. 24.53
- c. 22.0
- d. 22.3

60. Find the next picture of the following sequence - (+1, -0.33)



Your Personal Exams Guide

61. Who is the present Attorney General of India? (+1, -0.33)

- a. G. E. Vahanvati
- b. Milon K. Banerjee
- c. K. K. Venugopal
- d. Mukul Rohatgi

62. Identify the odd one out of the following - (+1, -0.33)



- a. A
- b. C
- c. D
- d. B

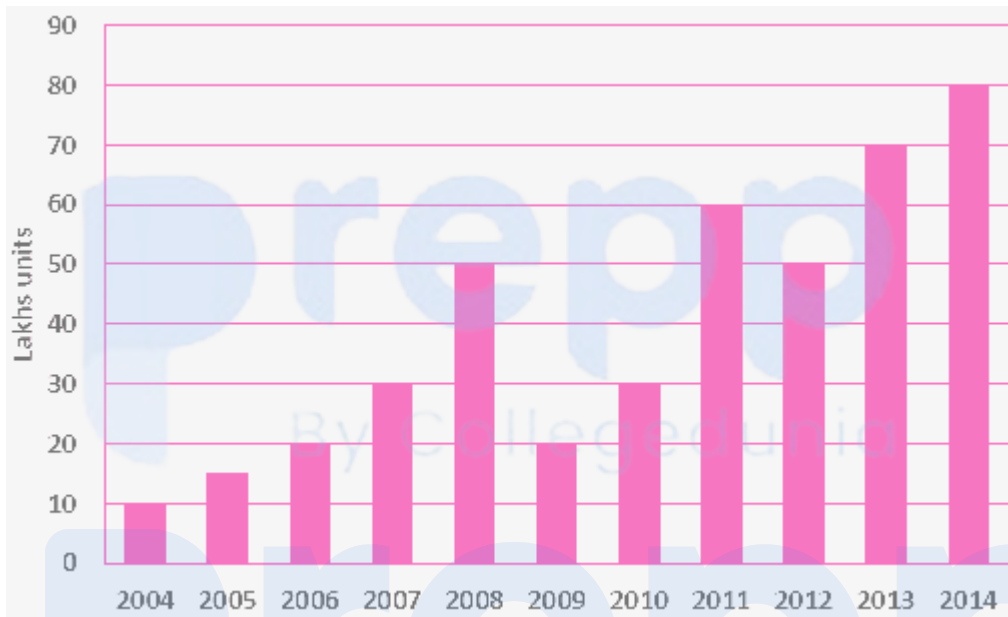
63. Starfish belongs to the _____ group. (+1, -0.33)

- a. Echinodermata
- b. Annelida
- c. Porifera
- d. Nematoda

64. The image formed on the retina of the human eye is- (+1, -0.33)

- a. Real and inverted
- b. Virtual and inverted
- c. Real and erect
- d. Virtual and erect

65. The following bar graph shows the information of Personal Computers sold by Company 'XYZ' in the last 10 years- (+1, -0.33)



How many million personal computers were sold by Company XYZ in 2012?

- a. 10
- b. 5
- c. 4
- d. 6

66. Below the statement are given followed by two assumptions numbered I and II. You have to decide which of the assumptions is/are implicit in the statement by considering the statement and the assumptions that follow. (+1, -0.33)

Statement:

He catches a bus to Hyderabad on Wednesday to attend an event held on Saturday at his aunt's house in Hyderabad.

Assumptions :

- I. He will reach Hyderabad on Thursday.
- II. He is trying to reach Hyderabad before the event ends.

- 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

67. In November 2017, India's Ritu Phogat won a silver medal in the Under 23 Senior World Wrestling Championship held in Poland. She has won the silver in the _____ category. (+1, -0.33)

- a. 50 Kilogram
- b. 58 Kilogram
- c. 45 Kilogram
- d. 48 Kilogram

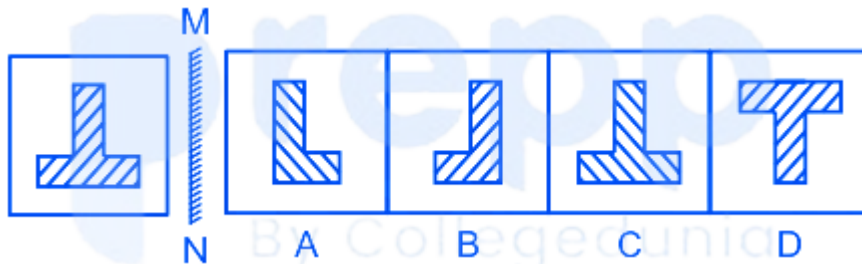
68. Which of the following basic elements is **NOT** from the class of alkali metals? (+1, -0.33)

- a. Potassium
- b. Rubidium

- c. Sodium
- d. Calcium

69. Select the mirror image of the figure given below -

(+1, -0.33)



- a. D
- b. C
- c. B
- d. A

70. The side length of a rhombus is $\sqrt{5}$ cm and its area is 4 cm^2 . What will be the sum of the lengths of its diagonals?

(+1, -0.33)

- a. 5 cm
- b. 6 cm
- c. 8 cm
- d. 7 cm

71. Satyawart Kadian is associated with which of the following sports?

(+1, -0.33)

- a. Hockey
- b. Kabbadi
- c. Football
- d. Wrestling

72. The difference between simple interest and compound interest on ₹ 20,000 in two years is ₹ 800. What is the annual rate of interest? (+1, -0.33)

- a. 30%
- b. 15%
- c. 25%
- d. 20%

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

Statement:

Nayan joined the local football team in 2014 as a player which helped the team win three consecutive championships between 2016 and 2018 for the first time ever.

Conclusion:

- I. Nayan has helped the team reach new heights.
- II. Nayan is a successful football player.

- a. None of the conclusions follow

- b. Both conclusions follow
 - c. Only conclusion II follows
 - d. Only conclusion I follows
-

74. Ramakant cycles at the speed of 10 km/hr and walks at the speed of 3 km/hr. Ramakant takes 8 hours to cover a distance of 45 km. How many of these kilometers were covered by cycle? (+1, -0.33)

- a. 50
 - b. 40
 - c. 30
 - d. 20
-

75. You want to increase the size of a cubical box by increasing its dimensions by half of the original size. Which of the following statements about the volume of the newly formed box is correct after the size of the box is increased? (+1, -0.33)

- a. This is 337.5% of the volume of the original box.
 - b. This is 112.5% of the volume of the original box.
 - c. It is 450% of the volume of the original box.
 - d. It is 150% of the volume of the original box.
-

76. An object of mass 14 kg is moving with a velocity of 5 ms^{-1} . Find the kinetic energy contained in the object? (+1, -0.33)

- a. 180.5 J
 - b. 17.5 J
 - c. 175 ms
 - d. 175 J
-

77. If the pH of a salt is 7, then this salt is _____. (+1, -0.33)

- a. Strong acid and weak base
 - b. Strong acid and strong base
 - c. Weak acid and weak base
 - d. Weak acid and strong base
-

78. Old alluvial soil is known as _____. (+1, -0.33)

- a. Bhangar
 - b. Regur
 - c. Clayey
 - d. Khadar
-

79. If X is the number of leap years in an interval of 100 years, then what will be the value of $X - 1$? (+1, -0.33)

- a. 25
- b. 22

c. 23

d. 24

80. Anjali borrowed ₹ 22,500 for 2 years at 6% simple interest per annum and on the same day she lent this amount to Ashok with compound interest at the same rate of interest and for the same time. How much loss or profit will she make? (+1, -0.33)

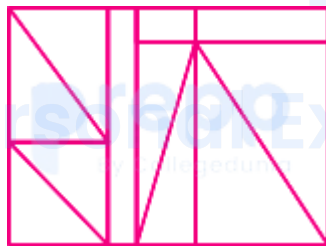
a. 73 Profit

b. 73 Loss

c. 81 Loss

d. 81 Profit

81. How many right angled triangles are there in the following figure? (+1, -0.33)



a. 5

b. 3

c. 8

d. 4

82. $(2 + 5) \times 4 + (4/2) = ?$ (+1, -0.33)

- a. 30
- b. 16
- c. 42
- d. 20

83. Who became the first Indian to win the prestigious Pritzker Prize for his outstanding lifelong contribution to architecture, in March 2018? (+1, -0.33)

- a. Satish Gujral
- b. Raj Rewal
- c. Balakrishna Doshi
- d. Charles Correa

84. Energy can neither be created nor destroyed, but it can be converted into one another. It is called ----- (+1, -0.33)

- a. Law of perpetual energy
- b. Law of conservation of energy
- c. Law of entropy
- d. Law of conservation of mass

85. Mary takes 30 minutes to do one round of a rectangular garden. Sila takes 45 minutes to make one round of the same garden. One day at 9 o'clock in the morning both of them started walking in the same direction (+1, -0.33)

from the same point. At what time will they meet again at the starting point?

- a. 10:45 am
- b. 10:00 am
- c. 11:00 am
- d. 10:30 am

86. A's mother is B's sister and C's daughter. D is son of B and brother of E. (+1, -0.33)
How is C related to E?

- a. Uncle
- b. Grandmother or grandfather
- c. Grandfather
- d. Grandmother

87. Which of the following does **NOT** belong to the group? (+1, -0.33)

- (A) Crocodile
- (B) Tortoise
- (C) Boat
- (D) Fish

- a. A
- b. C

c. D

d. B

88. What is the valence power (potential) of an element called? (+1, -0.33)

a. Atomicity

b. Atomic mass

c. Normality

d. Valency

89. Seema has 15 pencils on Monday. Her brother gives her 5 more pencils on Tuesday, takes 3 pencils from her on Wednesday. She gets 7 pencils from a friend on Thursday. If her brother gives her 5 more pencils on Friday, then how many pencils will she have on Saturday? (+1, -0.33)

a. 27

b. 37

c. 29

d. 39

90. A 5 m long stair, with a stable base on the street, can lead to two windows 4 m and 3 m high, located on the other side of the road. What is the width of the road? (+1, -0.33)

a. 6.2 m

b. 6 m

- c. 7 m
- d. 5.5 m

91. The minute hand in a clock moves by _____ minutes in an hour - (+1, -0.33)

- a. 55
- b. 10
- c. 35
- d. 25

92. A statement is followed by two arguments. Decide which of the arguments are strong in the context of the statement. (+1, -0.33)

Statement:

Should student organizations be banned?

Argument:

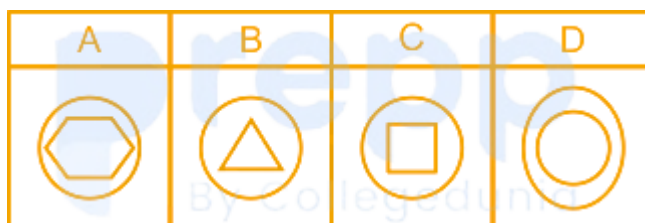
I. Yes, through this method only students can stop the aggressive behavior of the organizations.

II. No, it will deprive the students of their democratic rights.

- a. Only Argument II is Strong
- b. Neither I nor II is strong
- c. Both I and II are strong
- d. Only Argument I is Strong

93. Identify the odd one -

(+1, -0.33)



- a. B
- b. D
- c. A
- d. C

94. Kishan covered a distance of 96 km by cycle at a certain speed. If he cycled 4 km slower per hour, he would have taken an extra 2 hours to reach the destination. What is the speed in km/h at which Kishan actually cycled?

(+1, -0.33)

- a. 12
- b. 18
- c. 16
- d. 15

95. What is the SI unit of acceleration?

(+1, -0.33)

- a. ms^{-1}
- b. ms

- c. sm^{-1}
 - d. ms^{-2}
-

96. Hydro-Electric Project; Arun-III is in which country? (+1, -0.33)

- a. Nepal
 - b. India
 - c. Sri Lanka
 - d. Bangladesh
-

97. What does the odometer of an automobile measure? (+1, -0.33)

- a. Distance
 - b. Speed
 - c. Pressure
 - d. Smell
-

98. Find the next letter pair of the following series - (+1, -0.33)

VG, TH, RJ, PM, ?

- a. NQ
- b. NC
- c. QZ

d. QV

99. The l.c.m. of numbers 108, 135 and 162 is P; Then find the value of $P \div 4$? (+1, -0.33)

a. 1620

b. 400

c. 405

d. 602

100. If the weather is very humid, you will have to remove the emitted gas through a dry tube containing ----- (+1, -0.33)

a. $\text{Ca}(\text{OH})_2$

b. NaCl

c. NaOH

d. CaCl_2

Answers

1. Answer: b

Explanation:

Concept used:

$$0.0a = a/100$$

Calculation:

$$(759/100000) \times (10/33)$$

$$\Rightarrow 23/10000$$

$$\Rightarrow 0.0023$$

$\therefore$ Required answer is 0.0023

2. Answer: d

Explanation:

The logic followed here is:

i) UBI $\rightarrow$ Union Bank of India

ii) SBI $\rightarrow$ State Bank of India

iii) PNB $\rightarrow$ Punjab National Bank

iv) ONGC $\rightarrow$ Oil and Natural Gas Corporation.

Here, UBI, SBI, PNB are banking institutions where as ONGC is an institution which deals in oil and natural gas and other petroleum products.

Hence, 'ONGC' is does not belong to the group.

3. Answer: d

Explanation:

The correct answer is Ar and n₂.

★ Key Points

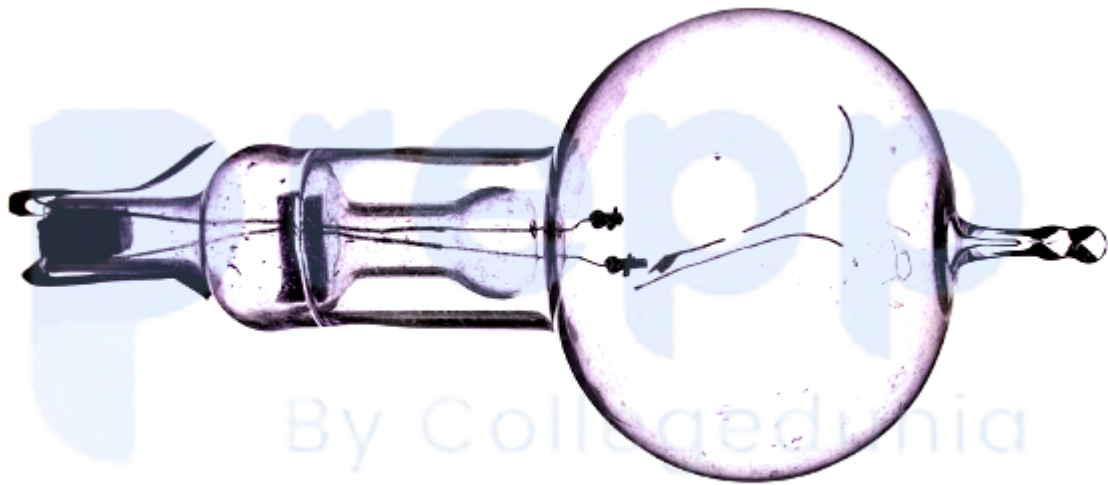
- **Ar and n₂** gas is used to **fill the electric bulb**.
 - Filling a bulb with an inert gas slows down the evaporation of the tungsten filament compared to operating it in a vacuum.
 - This allows for greater temperatures and therefore greater efficacy with less reduction in filament life.

★ Additional Information

- **Argon** is a commonly used gas, used to fill incandescent light bulbs. It increases the bulb life by preventing the tungsten filament from deteriorating too quickly.
 - Other gases such as helium, neon nitrogen, and krypton are also used in lightning.
- Inert gases are reactive towards the burning filament of the bulb. Therefore we have to use either inert gases like Argon or inactive nitrogen.

★ Important Points

- In **1878**, **Thomas Edison** began serious research into developing a practical incandescent lamp and on **October 14, 1878**, Edison filed his **first patent** application for **Improvement In Electric Lights**.



Original carbon-filament bulb from Thomas Edison.

4. Answer: c

Explanation:

The correct answer is Aamir Khan.

★ Key Points

- Aamir Khan played the lead role in the movie 'Dangal' released in 2016.
- **Aamir Khan** was honoured with the **Best Actor Award in 2017** at Filmfare Awards.
- He was awarded for his film Dangal for his role as Mahavir Singh Phogat.

★ Additional Information

- Alia Bhatt was awarded **Best Actress** for her film Uda Punjab.
- **Best Film** was won by film **Dangal**.
- Nitesh Tiwari won Best Director for the film **Dangal**.

5. Answer: b

Explanation:

The correct answer is Resistance.

★ Key Points

- The **current** flowing through a **resistor** is inversely proportional to its **resistance**.
 - **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**.

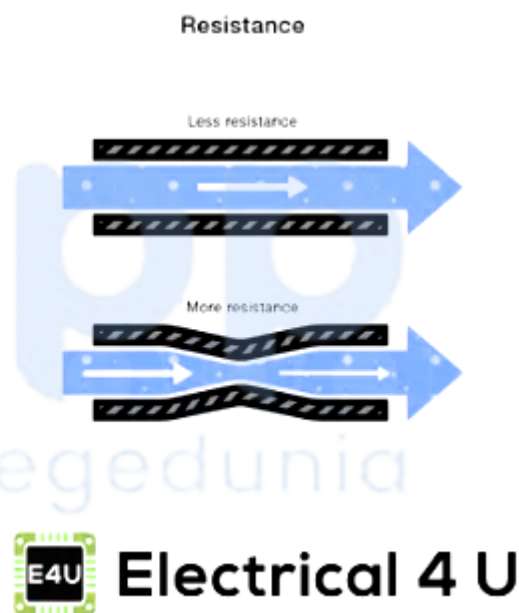
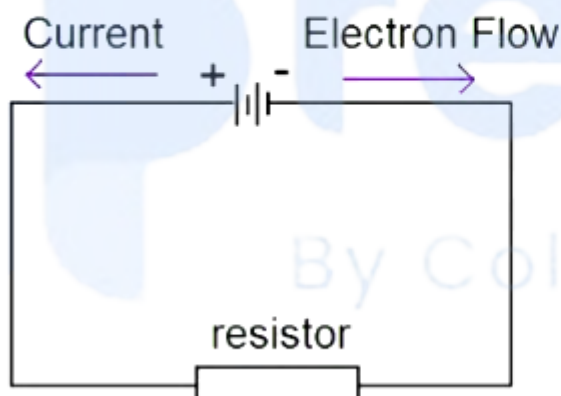
★ Additional Information

- 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) V = voltage difference which is between the two ends of a resistor (Volts, V).

★ Important Points

Your Personal Exams Guide

What is Electrical Resistance?



6. Answer: a

Explanation:

The logic followed here is:

- Neon, Helium, and Xenon are noble gases or inert gases whereas Zinc is a metal.

Hence, Zinc does not belong to the group.

★ Additional Information

- Neon (Ne), Helium(He), and Xenon (Xe) belong to group 18.
- Zinc (Zn) is brittle and silvery greyish in colour. It belongs to group 12 of the periodic table.

7. Answer: a

Explanation:

The logic followed here is:

Here the code for SPANNER is as follows:

Alphabet	S	P	A	N	N	E	R
Code	G	C	D	J	J	B	S

Similarly,

NEAR is coded as

Alphabet	N	E	A	R
Code	J	B	D	S

Hence, NEAR will be written as 'JBDS' in the given code language.

8. Answer: d

Explanation:

The correct answer is 8 ms^{-1}

★ Key Points

• Solution:

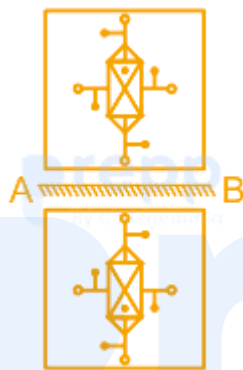
- Here, $u = 0$, $t = 0.8 \text{ s}$, $g = 10 \text{ m / s}^2$.
- $v = u + g t = 0 + 10 \times 0.8$

- 8
- 8 ms^{-1} is the speed when it hits the ground.

9. Answer: a

Explanation:

The logic followed here is:



Hence, option 2 is the correct answer.

10. Answer: c

Explanation:

The logic followed here is:

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 place value of A is 1, D is 4, O is 15 and U is 21.

In each of the given figure the alphabet and its place value are given except U and 23 in figure D.

Hence, figure D is the odd one from the given figures.

11. Answer: c

Explanation:

The least possible Venn diagram is as follows:



Conclusion :

1. Some weak are tissues. → True (as some tissues are weak)
2. Some bones are tissues. → False (as it is possible but not definite).

Hence, only conclusion 1 follows.

12. Answer: b

Explanation:

The correct answer is 100N.

★ Key Points

- The mass of an object is **10 kg** . Its weight on earth is **100N**.
- **The weight of a body** is a product of its **mass** and **acceleration** due to **gravity** on **earth** .
 - **Weight varies** with **location** depending upon the **acceleration** due to **gravity**.

★ Additional Information

- Solution details:

- $w = mg$
- (Here $m = 10\text{kg}$.)
- $g = 10\text{m/s}^2$
- $w = 10 \times 10\text{kgm/s}^2$
- $w = 100\text{N}$
- Therefore, the **weight** of the **object** on **earth** will be **100N**.

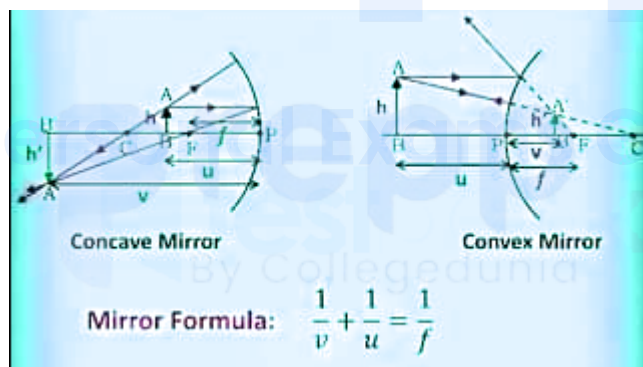
13. Answer: c

Explanation:

The correct answer is $1/u + 1/v = 1/f$.

★ Key Points

- In ray optics, The object **distance**, **image distance**, and **Focal length** are related as $1/u + 1/v = 1/f$.
- The **relation between the focal length of the mirror, the distance of the object, and the distance of the image** are known as the **mirror formula**.



★ Additional Information

- A **highly polished surface**, such as a **mirror**, reflects most of the light falling on it. Reflection is governed by the following laws:
 - The **angle of incidence** is equal to the **angle of reflection**, and
 - The **incident ray**, the **normal to the mirror at the point of incidence**, and the **reflected ray**, all lie in the same plane.
- **Types of the mirror :**

- Plane Mirror
- Concave Mirror
- Convex Mirror

14. Answer: d

Explanation:

The correct answer is propyne.

★ Key Points

- **Propyne** (methylacetylene) is an alkyne with the chemical formula $\text{CH}_3\text{C}\equiv\text{CH}$.
- It is a component of **MAPD gas** - along with its isomer **propadiene (allene)**, which was commonly used in **gas welding**.
- **Propyne** contains three **carbon atoms** and **four hydrogen** atoms in the above structure.
- **Carbon-1** is attached to one hydrogen atom through a single bond (sigma bond) and carbon-1 is attached to carbon-2 through a triple bond (one sigma bond and two pi bonds).



★ Additional Information

- When **three pairs of electrons** are shared between **two carbon atoms**, a **triple bond** is formed between the **two carbon atoms**.
- A triple bond is made of **two pi bonds and one sigma bond**.
- Examples of compounds with triple bonds include **nitrogen gas**, **cyanide ion**, **acetylene**, and **carbon monoxide**.

15. Answer: d

Explanation:

The correct answer is Roshni Nadar.

★ Key Points

- **Roshni Nadar** is the **Executive Director** and **CEO** of **HCL**.
 - **Roshni Nadar Malhotra** is the only child of **HCL's founder, billionaire industrialist**, and philanthropist **Shiv Nadar**.
 - She has featured in **The World's 100 Most Powerful Women** list compiled and released by **Forbes** in **2017, 2018, and 2019**.
 - She is also the **richest woman in India**, according to **IIFL Wealth Hurun India Rich List (2019)**.
 - She established **The Habitats Trust** in **2018**, which aims to work toward protecting India's natural habitats and its indigenous species.

★ Additional Information

- As of now, **C Vijayakumar** is **CEO** of **HCL** and he has appointed in **October 2016**.
 - **C Vijayakumar** joined **HCL Technologies** in **1994** in the founding startup team of **Comnet** as a **senior technical engineer**.

★ Important Points

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Person Name	Details
Kiran Nadar	- Kiran Shiv Nadar is an Indian art collector and philanthropist. - Kiran is the wife of Shiv Nadar, the founder of HCL Technologies, and is a trustee of the Shiv Nadar Foundation and the founder of the Kiran Nadar Museum of Art.
Shiv Nadar	- Shiv Nadar is an Indian billionaire industrialist and philanthropist. - He is the founder and chairman emeritus of HCL Technologies Limited and the Shiv Nadar Foundation.
Arjun Malhotra	- Arjun Malhotra is an Indian entrepreneur, industrialist and philanthropist. - In 1975, Malhotra co-founded HCL Group, where he served as vice-chairman. - He also founded TechSpan and served as chief executive officer of US-based firm Headstrong after the two companies merged.

Your Personal Exams Guide

16. Answer: d

Explanation:

The logic followed here is:

The main figure is



Figure A: the above figure is rotated 90 degrees to the right.

Figure B: the above figure is rotated 90 degrees to the left.

Figure C: the above figure is rotated 180 degrees to the right.

Figure D: this is a mirror image of the above image. Only figure D cannot be obtained by rotation of the main figure.

Hence, figure D does not belong to the group.

17. Answer: b

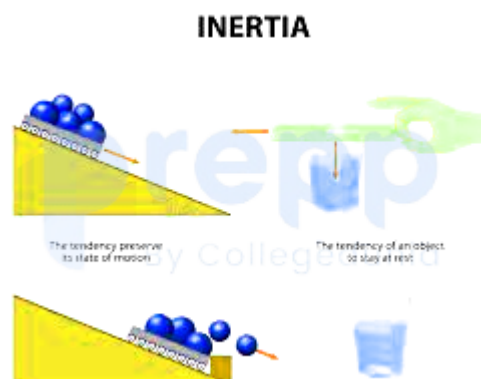
Explanation:

The correct answer is Inertia.

★ Key Points

- The measurement of the **mass of an object** is called **Inertia**.
 - **Inertia** is the resistance of any **physical object** to any change in its **velocity**. This includes changes to the object's speed or direction of **motion**.
 - **Inertia** is a passive property and does not enable a body to do anything except oppose such active agents as **forces and torques**.

★ Additional Information



★ Important Points

Name	Details
Acceleration	• acceleration, the rate at which velocity changes with time, in terms of both speed and direction. • A point or an object moving in a straight line is accelerated if it speeds up or slows down. • Acceleration is defined as the change in the velocity vector in a time interval, divided by the time interval.
Impulse	• Impulse in Physics is a term that is used to describe or quantify the effect of force acting over time to change the momentum of an object. • It is represented by the symbol J and is usually expressed in Newton-seconds or kg m/s.
Speed	• Speed can be thought of as the rate at which an object covers distance. • A fast-moving object has a high speed and covers a relatively large distance in a given amount of time, while a slow-moving object covers a relatively small amount of distance in the same amount of time.

18. Answer: b

Explanation:

The correct answer is Alia Bhatt.

★ Key Points

- **Alia Bhatt** was given the '**Best Actress**' award at the Filmfare Awards 2017.
- She won this award for the role of Bauria in the movie **Udta Punjab**.

★ Additional Information

2017 Filmfare Award Winner

Category	Winner
Best Film	Dangal
Best Director	Nitesh Tiwari for Dangal
Best Actor	Aamir Khan for Dangal
Best Supporting Actor	Rishi Kapoor for Kapoor and Sons
Best Supporting Actress	Shabana Azmi for Neerja

19. Answer: a

Explanation:

The correct answer is Only A is true.

★ Key Points

- **State of Matter:**
 - Three states of matter exist – solid, liquid, and gas. Solids have a definite shape and volume. Liquids have a definite volume, but take the shape of the container. Gases have no definite shape or volume.
 - The firmness of a solid is due to the forces holding atoms or molecules together.
 - **The particles in a solid are close together.**
 - Hence, statement A is True.
- **Compressibility:**
 - It is the property of a substance in which its **volume decreases** under high **pressure** and it is called **Compressibility**, not **size**.
 - This property is found in gases.
 - **Gases are highly compressible.**

- Hence, statement B is Incorrect.

20. Answer: c

Explanation:

Given:

Pipe 1 can fill a tank in 5 hours

Pipe 2 can fill a tank in 7 hours

Pipe 3 can empty the tank in 14 hours

Formula used:

Work done = Time $\times$ Efficiency

Time $\propto 1/\text{Efficiency}$

Calculation:

In one hour,

Pipe 1 can fill $1/5$

Pipe 2 can fill $1/7$

Pipe 3 can empty $1/14$

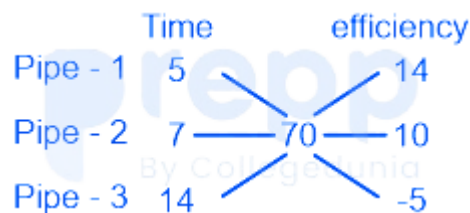
In one hour all the pipes can fill $1/5 + 1/7 - 1/14$

$$\Rightarrow (14 + 10 - 5/70) = 19/70$$

$\Rightarrow$ The tank will be filled completely in $70/19 = 3\frac{13}{19}$ hours

$\therefore 3\frac{13}{19}$ hours will it take to fill the tank completely

★ Alternate Method



Total efficiency = 19

The tank will be filled completely in $70/19 = 3\frac{13}{19}$ hour

21. Answer: c

Explanation:

The correct answer is Ragam.

★ Key Points

- In **January 2016**, **All India Radio (AIR)** launched a non-traditional audio broadcast channel via the Internet, which is readily available through 'Free Dish' for experts in the arts, especially classical music-both Karnataka and Hindustani. It is known as **Ragam**.
- The channel was launched by **Prasar Bharati Chairman Surya Prakash** and it will be uplinked from AIR Bengaluru station.
- 'Raagam' will be active round-the-clock and can be downloaded from under the mobile application-**All India Radio Live**.

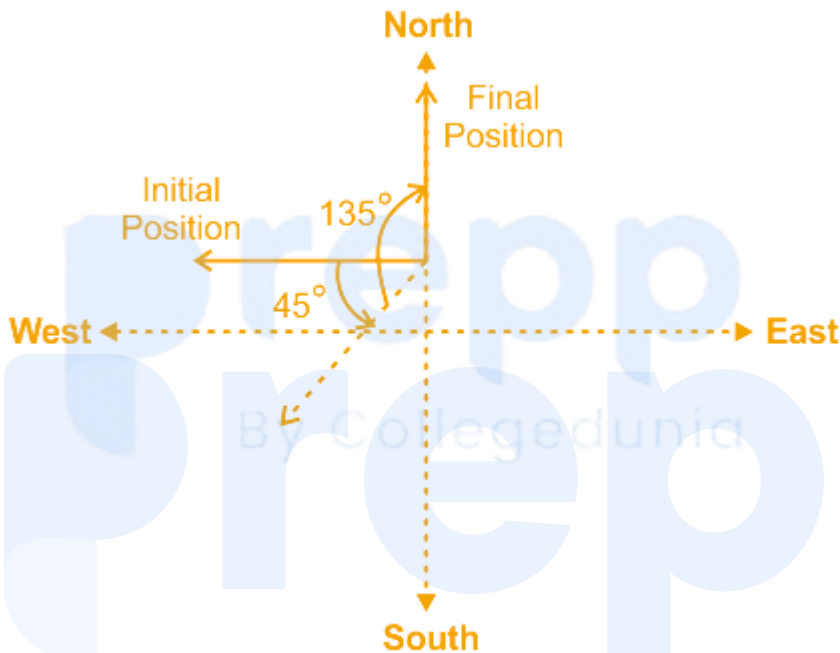
★ Additional Information

Radio Channel	Established in Year
Big FM	2006
Radio Mirchi	1993
Taal	Taal Radio is a Hindi Fm radio having broadcasting from the United States.

22. Answer: d

Explanation:

The diagrammatic representation of the given data is as follows



Hence, Sunayata is facing 'North' direction now.

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23. Answer: b

Explanation:

Given:

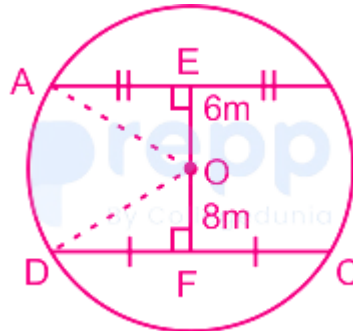
The radius of the circle = 10 cm

Concept used:

The shortest distance on the chord of the circle from the center made 90°

It divides the chord into two equal parts

Calculation:



In $\triangle AOE$

$$AE^2 = AO^2 - EO^2$$

$$\Rightarrow AE^2 = 100 - 36 = 64$$

$$\Rightarrow AE = 8$$

$$AB = 2 \times AE = 2 \times 8 = 16 \text{ cm}$$

And, In $\triangle DOF$

$$DF^2 = DO^2 - FO^2$$

$$\Rightarrow DF^2 = 100 - 64 = 36$$

$$\Rightarrow DF = 6$$

$$DC = 2 \times DF = 2 \times 6 = 12 \text{ cm}$$

$$\text{Difference between two chord} = 16 - 12 = 4 \text{ cm}$$

$\therefore$ Difference between two chord is 4 cm

Note:

The actual question was different than this, there were some discrepancies in the official so, we have to change the question accordingly.

24. Answer: b

Explanation:

Given:

CP of the land = Rs. 3 lakh

Concept used:

$$SP = (CP + CP \times \text{Profit}\%)$$

Calculation:

$$15\% \text{ of } 3 \text{ lakh} = \frac{3}{20} \times 300000$$

$$\Rightarrow 45000$$

$$SP \text{ of } 25\% \text{ of } 3 \text{ lakh} = \frac{1}{4} \times \frac{3}{4} \times 300000$$

$$\Rightarrow 56250$$

$$SP \text{ of } 40\% \text{ of } 3 \text{ lakh} = \frac{2}{5} \times \frac{5}{4} \times 300000$$

$$\Rightarrow 150000$$

$$\text{So, SP of remaining} = 345000 - (56250 + 150000)$$

$$\Rightarrow 138750$$

$\therefore$ He should sell the rest of the child plot to make a total profit of 15% is Rs 138750.

25. Answer: a

Explanation:

The correct answer is 108, 11.

★ Key Points

- Out of the **108 Upanishads**, **11 Upanishads** are considered to be the main.
- The word **Upanishad** means to sit down near someone and denotes a student sitting near his guru to learn.

★ Additional Information

- The 11 Upanishads that are predominant are called “**Mukhya Upanishads**”.
- The **11 Mukhya Upanishads** are:
 - **Aitareya Upanishad**
 - **Bṛhadaranyaka Upanishad**
 - **Taittiriya Upanishad**
 - **Chandogya Upanishad**
 - **Kena Upanishad**
 - **Īśa Upanishad**
 - **Śvetasvatara Upanishad**
 - **Kathopnishad**
 - **Muktika Upanishad**
 - **Maandūkya**
 - **Praśna**

26. Answer: a

Explanation:

- Since Ramu has made a train reservation in April, one month in advance for his travel plan in May, it indicates that it is possible to do rail reservations one month in advance.
- Thus, assumption I is implicit.
- Assumption II talks about trains from Mumbai to Hyderabad which is not mentioned or suggested anywhere in the statement, thus it is not implicit.

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

27. Answer: c

Explanation:

The correct answer is A and D.

★ Key Points

- **The Jumping of frogs** is the activity of voluntary muscles as it is controlled by skeletal muscles.
- **Pumping of the heart** is involuntary, i.e., it is controlled by cardiac muscles.
- **Writing with the hand** is voluntary muscles action.
- The movement of chocolate in your intestine is involuntary muscles.
- **Heartbeat** is an activity of involuntary muscles.

★ Additional Information

- **Voluntary muscles** are long, multinucleated cells, containing sarcomeres arranged into bundles.
 - They play an important role in allowing the body to move by contracting and relaxing and their actions are mainly under the control of the somatosensory nervous system.
- **Involuntary muscles** are striated and branched in the case of cardiac muscle.
 - The actions of involuntary muscles are mainly controlled by the autonomic nervous system in the body.

28. Answer: a

Explanation:

The correct answer is 28.

★ Key Points

- The relative mass of CO is 28g.

- The relative **formula mass** of a substance, shown in **grams**, is called one mole of that substance. So one **mole** of **carbon monoxide** has a mass of **28 g**, and one mole of **sodium oxide** has a mass of **62 g**.
- The element Cobalt belongs to group VIII of the periodic table. It is similar to iron and nickel in their physical properties.
- Cobalt is found in plants and animals, air, water, soil, and rocks.
- It may also enter into another environment through wind-blown dust or by rainwater washing down cobalt-containing soil and rock.

29. Answer: c

Explanation:

Given:

Medini can take 16 days to paint the wall

Yuki takes 3 times of Medini

Concept used:

If a person can complete a work alone in x days, then the efficiency (part of the work completed in one day) = $1/x$

Calculation:

$$1 \text{ day work of Medini} = 1/16$$

$$1 \text{ day work of Yuki} = 1/(16 \times 3) = 1/48$$

$$\text{Total work in 1 day} = 1/16 + 1/48$$

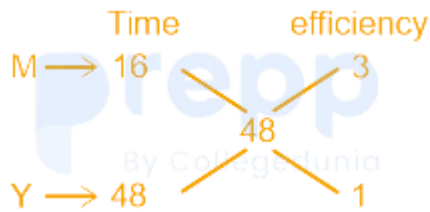
$$\Rightarrow (3 + 1)/48$$

$$\Rightarrow 1/12$$

So, they will complete total work in 12 days and half of the work in $12/2 = 6$ days

$\therefore$ They will 6 days to paint half the wall if they work together

★ Shortcut Trick



Total efficiency = 4

Half of total work = 24

Time taken to complete half of the work is $24/4 = 6$ days

30. Answer: b

Explanation:

Given:

8281

Concept used:

Prime factorisation of a number

Calculation:

Prime factorisation of $8281 = 7 \times 7 \times 13 \times 13$

So, $\sqrt{8281} = 7 \times 13$

$\Rightarrow 91$

$\therefore$ Square root of 8281 is 91

31. Answer: a

Explanation:

The correct answer is M Subbaraidu.

★ Key Points

- **Shri M. Subbarayudu** was appointed as the next Ambassador of India to the **Republic of Peru** in 2017.
- He joined the **Indian Forest Service** in the year **1994**.
- He has served at the **Ministry of External Affairs**, New Delhi as Deputy Secretary in the Central Europe Division and Joint Secretary in charge of Development Partnership Administration.

★ Additional Information

Person	Description
Arup Kumar Saha	He was the second secretary to Peru.
Sandeep Chakraborty	He had earlier served as India's Ambassador to Peru and Deputy High Commissioner in Dhaka.

32. Answer: b

Explanation:

Given:

Circumference = Diameter + 15 cm

Concept used:

Circumference of a circle = $2\pi r$

Calculation:

Let the diameter of the circle be d

So, circumference is πd

$$\pi d - d = 15$$

$$\Rightarrow d(\pi - 1) = 15$$

$$\Rightarrow d(22/7 - 1) = 15$$

$$\Rightarrow d(15/7) = 15$$

$$\Rightarrow d = 7 \text{ cm}$$

So, radius = 3.5 cm

$\therefore$ The radius of the circle is 3.5 cm

33. Answer: a

Explanation:

The logic followed here is as follows:

Shoes, Grass and Mobile are all three unrelated words.

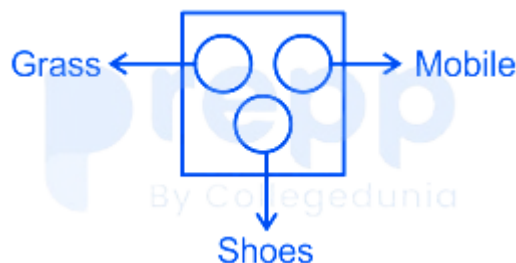
In other words,

No shoes is Grass

No Grass is Mobile.

No Mobile is Shoes.

Therefore, the best possible venn diagram representation is as follows:



Hence, the above diagram is the correct answer.

34. Answer: c

Explanation:

The correct answer is 1526.

★ Key Points

- The **first battle of Panipat** was fought in **1526**.
 - The **First Battle of Panipat**, on **21 April 1526**, was fought between the invading forces of **Babur** and the **Lodi dynasty**.
 - It took place in **North India** and marked the beginning of the **Mughal Empire** from **1526** to **1857** and the end of the **Delhi Sultanate**.
 - **Battles of Panipat**, (1526, 1556, 1761), **three military engagements**, important in the **history of northern India**, fought at **Panipat**.

★ Additional Information

- **Ibrahim Lodi** lost the **fight** and it denoted the start of the **Mughal Empire** and the **finish** of the **Delhi Sultanate** in **India**.
- **Babur** used **modern tactics** of warfare and introduced the deadly combination of **Tulghuma** and **Araba**.
 - **Tulghuma** meant the division of the **army** into the **left, right, and center units**, while **Araba** referred to the **carts** used to **launch cannon fire**.

★ Important Points

- Panipat:
 - **Panipat** is a historic city in **Haryana, India**.
 - The city is famous in India as the **City of Weavers** and **Textile City**. It is also known as the **cast-off capital** due to being the **global center for recycling textiles**.
 - **Panipat district** was carved out from the erstwhile **Karnal district** on **1 November 1989**.

- On **24 July 1991**, it was again **merged** with **Karnal district**. On **1 January 1992**, it again became a **separate district**.

35. Answer: d

Explanation:

The correct answer is **5 Years**.

★ Key Points

- **5 years** is the tenure of **Lok Sabha** members.
 - **Lok Sabha** is composed of representatives of the people chosen by **direct election** on the basis of **adult suffrage**.
 - The term of a member of parliament of Lok Sabha (dissolved) is **five years** from the **date appointed** for its **first meeting**.
 - During a state of **emergency**, the term however can be extended by the **Parliament of India** by **law** for a period not exceeding **one year** at a time.

★ Additional Information

- On **26 January 1950**, the **Indian constitution** came into **force** and the **first general elections** (under the new constitution) were held in **1951-1952**.
- The **1st Lok Sabha** was constituted on **17 April 1952** and had **489 constituencies**, thereby the first set of elected members of parliament of **Lok Sabha** in **India**.
- The **maximum permitted strength** of members of **parliament** in the **Lok Sabha** is **550**.
- The first instance of a member of parliament equivalent in India dates back to **9 December 1946**, the day **the Constituent Assembly of India** was formed with the purpose of drafting a **constitution** for **India**.

★ Important Points

- As per **Article 93** of the Indian Constitution, the Lok Sabha has a Speaker and a Deputy Speaker.

36. Answer: b

Explanation:

The correct answer is Metal.

★ Key Points

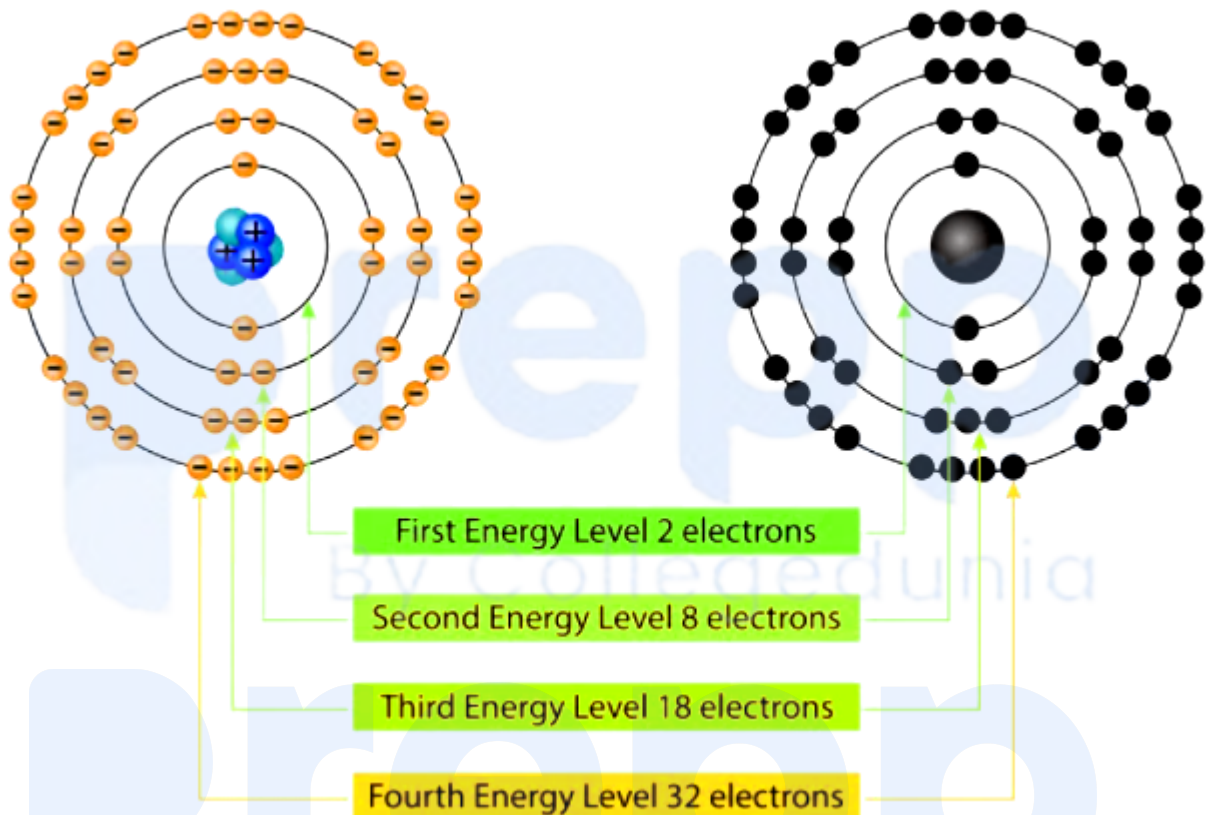
- **Metal** has **1 to 3 electrons** in its outermost shell.
- **Metals** usually have **1, 2, or 3 electrons** in their **valence shell**.
- A **valence shell** means the **outermost shell** of an **atom** containing the valence electrons.
- The greater the number of shells and the lesser the number of **valence electrons**, the greater is the reactivity of the **metal**.

★ Additional Information

- The **atom** of **every element** has different electronic configurations.
- For example, **Sodium Atomic no. =11**
 - Therefore electronic configuration of Sodium is **2 8 1**.

★ Important Points

- **Electron shell diagram:**



37. Answer: b

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.**

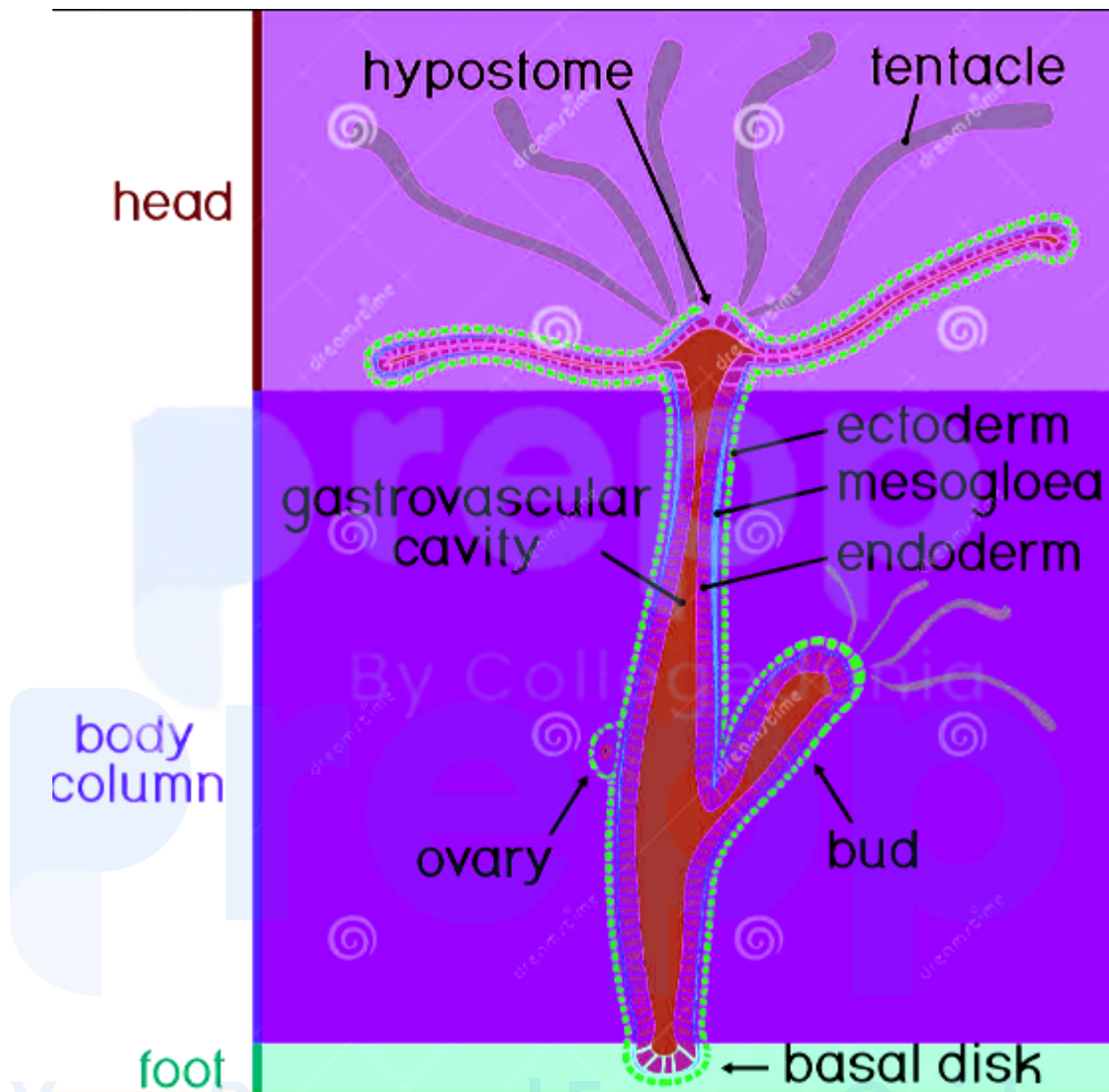
★ Additional Information

- 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:

Your Personal Exams Guide



38. Answer: b

Explanation:

The correct answer is 1.

★ Key Points

- In the modern periodic table, **period 1** consists of only gases.
- There are only two elements in the first period: **hydrogen and helium**.
- Period 1 elements follow the **duet rule**, they only need two electrons to complete their valence shell.

- The **modern Periodic law** can be stated as: "The physical and chemical properties of the elements are periodic functions of their atomic numbers"

★ Additional Information

Period	Elements
2	lithium, beryllium, boron, carbon, nitrogen, oxygen, fluorine, and neon.
3	sodium, magnesium, aluminum, silicon, phosphorus, sulfur, chlorine, and argon.
4	scandium (Sc), titanium (Ti), vanadium (V), chromium (Cr), manganese (Mn), iron (Fe), cobalt (Co), nickel (Ni), copper (Cu), and zinc (Zn).

39. Answer: c

Explanation:

Given:

$$2x + 3y = -5 \text{ and } 2x + py = 2$$

Calculation:

$$2x + 3y = -5$$

$$\Rightarrow 2x = -3y - 5$$

$$2x + py = 2$$

$$\Rightarrow 2x = 2 - py$$

$$2 - py = -3y - 5$$

$$\Rightarrow 3y - py = -7$$

$$\Rightarrow y(3 - p) = -7$$

If we take $p = 3$ then the equation will not be satisfied

$\therefore$ The value of p is any number other than 3

40. Answer: c

Explanation:

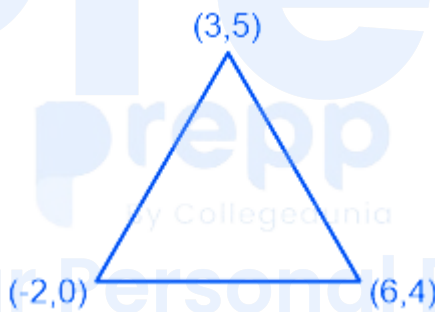
Given:

Vertices are $(3, 5)$, $(-2, 0)$ and $(6, 4)$

Formula used:

Area of triangle = $\frac{1}{2}[x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)]$

Calculations:



Area of triangle = $\frac{1}{2}[3(0 - 4) - 2(4 - 5) + 6(5 - 0)]$

$\Rightarrow \frac{1}{2}[-12 + 2 + 30]$

$\Rightarrow \frac{1}{2} \times 20$

$\Rightarrow 10$

$\Rightarrow$ Area of triangle = 10 unit²

$\therefore$ The area of the triangle is 10 unit²

41. Answer: b

Explanation:

The correct answer is Uttarkashi.

★ Key Points

- 'Gangotri Swachh Iconic Place Project and Swajal' was launched in the **Uttarkashi district** of Uttarakhand.
- The **Union Ministry of Drinking Water and Sanitation** has launched the Gangotri Swachh Iconic Place project and Swajal.
- The project will create cleanliness, provide basic amenities to the people of Ganga bank villages, and will also generate employment.

★ Additional Information

- The SIP (Swachh Iconic Place) is a drive under the Swachh Bharat Mission and aims to improve the sanitation and cleanliness of the 100 most iconic places in the country.
- The project was launched by **Uma Bharti** (Union Minister – 2018).
- This project is being coordinated by the:
 - Department of Drinking Water and Sanitation (DDWS),
 - Ministry of Jal Shakti in association with the Ministry of Housing and Urban Affairs (MoHUA),
 - Ministry of Tourism,
 - Ministry of Culture
 - and the concerned State/UT governments.

42. Answer: a

Explanation:

The correct answer is India.

★ Key Points

- **India** became the third-largest country in terms of domestic air traffic in **March 2017**.
- India's domestic air passenger traffic stood at 100 million in 2016 and was behind only the US (**719 million**) and China (**436 million**).
- India acquired the third spot globally by unseating **Japan**, which flew 97 million domestic passengers in 2016.

★ Additional Information

- The **aviation sector** is one of the **25** sectors which has been there under the Make in India scheme.
- Area wise **Indira Gandhi International airport (New Delhi)** is the biggest airport in India.
- IGI is also the **busiest airport** in India. In **FY 20-21** this airport handled approx **22,583,736 passengers**.

43. Answer: c

Explanation:

The correct answer is Rohit Sharma.

★ Key Points

- The **Mumbai Indians** captain **Rohit Sharma** has won **three** consecutive **IPL titles**.
 - Rohit Sharma was born on **30 April 1987, Nagpur, Maharashtra, India**.
 - **Rohit Sharma** is an **Indian international cricketer** who **captains** the **India national cricket team** in **ODIs** and **T20Is**.
 - In **November 2013**, during **Sachin Tendulkar's farewell** series, **Sharma** made his **Test debut** at **Eden Gardens** in **Kolkata**.
 - **Sharma** joined the **Indian Premier League (IPL)** in **2008** when he was signed by the **Deccan Chargers franchise**.
 - In the **2011 auction**, he was sold for **US\$2 million** to the **Mumbai Indians**.

★ Additional Information

Person Name	Details
Virat Kohli	- Virat Kohli is an Indian cricketer and the captain of the Indian national cricket team in Tests. - He plays for Delhi in domestic cricket and Royal Challengers Bangalore in the Indian Premier League. - In 2017, Kohli was honored with the Padma Shri award and in 2013 the Arjuna award.
Mahendra Singh Dhoni	- Mahendra Singh Dhoni is a former international cricketer who captained the Indian national cricket team in limited-overs formats from 2007 to 2017 and in Test cricket from 2008 to 2014. - In 2018 Dhoni was honored with Padma Bhushan. - In 2009 Dhoni was honored with Padma Shri and 2007–08 Major Dhyan Chand Khel Ratna.
Gautam Gambhir	- Gautam Gambhir is an Indian politician and former cricketer, who has played all formats of the game. - He is a current member of the Lok Sabha since 2019. - He set up community kitchens in 2017 through the Foundation in Patel Nagar, Delhi.

★ Important Points

- In 2015, Rohit Sharma was honored with Arjuna Award.
- In 2020, Rohit Sharma was honored with **Major**Dhyan Chand Khel Ratna.

44. Answer: d

Explanation:

According to the table,

In quarter 3 price difference = $65 - 40 = 25$

$\therefore$ In quarter 3 price difference was the highest

45. Answer: a

Explanation:

The correct answer is Vikas Sathe.

★ Key Points

- **Vikas Sathe** was awarded the **Scientific and Engineering Academy Award** at the Oscar Scientific and Technical Awards 2018 held in February 2018 in Los Angeles, California.
- Sathe and his team received the award for his contribution towards conceptualization, designing, engineering, and the implementation of the '**Shotover K1 Camera System**' during his stint at Shotover Camera Systems in Queenstown, New Zealand.
- Vikas Sathe is a **Pune-born** Indian engineer.

★ Additional Information

- About Shotover K1 Camera System
 - The **Shotover K1 Camera System** is a camera mount that is used for **aerial filming**.
 - The six-axis stabilized aerial camera mount can be attached to the base of a helicopter, which carries the camera and lens.
 - The primary function of the camera mount is to ensure steady footage by eliminating any vibration from reaching the camera.

46. Answer: b

Explanation:

The correct answer is Kuttanad.

★ Key Points

- Kuttanad is the **lowest Below to sea level** of India.
 - Kuttanad is a region that covers the **Alappuzha ,Kottayam, and Pathanamthitta Districts** , in the state of **Kerala** .
 - The region has the **lowest altitude** in the **country** and is one of the **rarest places** in the **world** where **farming** is carried on around **1.2 to 3.0 meters** (4 to 10 ft) below **sea level**.
 - **Paddy** is the **major cultivation** done in **the Kuttanad region** .

★ Additional Information

Important places of India	
The highest point of India	K2.
The lowest Altitude of India	Kuttanad.
The coldest point of India	Dras, Jammu, and Kashmir.
The hottest point of India	Jaisalmer, Rajasthan.
The driest point of India	Leh, Jammu, and Kashmir.
The wettest point of India	Mawsynram, Meghalaya

★ Important Points

Place	Details
Wayanad	- Wayanad, the green paradise is nestled among the mountains of the Western Ghats, forming the border world of the greener part of Kerala. - Wayanad was a part of the Malabar District until 31 March 1877. - During British Raj, Wayanad was a Taluk in the erstwhile Malabar District.
Chettinad	- Chettinad is a region located mainly in the Sivaganga district historically ruled by the Ramnad kingdom of Pandya Nadu and has a small portion extending into the Pudukottai District in Tamil Nadu, India. - In the 19th and early 20th centuries, many residents of Chettinad were trading in South and Southeast Asia, particularly Burma, Ceylon, Vietnam, and Malaysia.
Indira Point	- Indira Points refers to the southernmost tip of Great Nicobar Island which is also the Southernmost point of India. - The point was formerly known as Pygmalion Point and Parsons Point. - The Indira Point lighthouse was commissioned into service on 30 April 1972.

47. Answer: b

Explanation:

Given:

Ratio of A and B = 7 : 5

Calculation:

According to the question,

$$(7x - 9 \times 7/12)/(5x - 9 \times 5/12 + 10) = 7/9$$

$$\Rightarrow (28x - 21)/(20x + 25) = 7/9$$

$$\Rightarrow 252x - 189 = 140x + 175$$

$$\Rightarrow 112x = 364$$

$$\Rightarrow x = 3.25$$

$$\Rightarrow 7x = 22.75$$

$\therefore$ 22.75 liters of liquid A was in the bucket

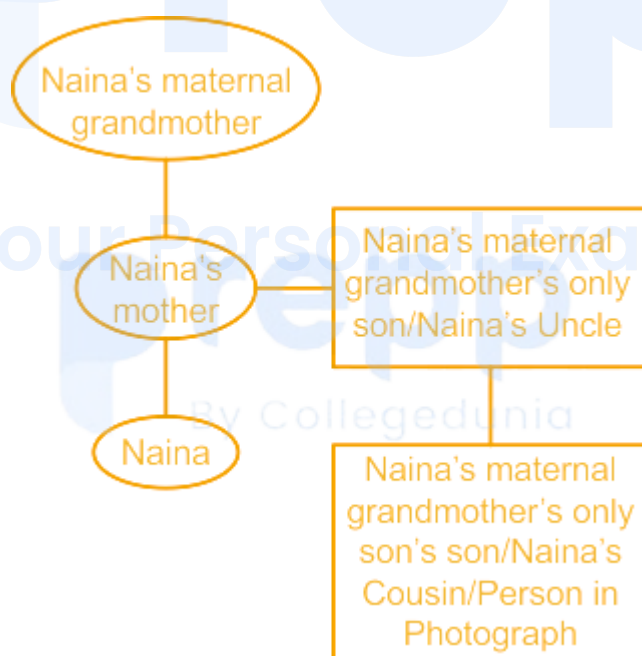
48. Answer: d

Explanation:

Preparing the family tree using the following symbols:

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Symbol in Diagram	Meaning
○	Female
□	Male
==	Married Couple
—	Siblings
	Difference of A Generation



Hence, the person in the photograph is the **Cousin** of Naina.

49. Answer: c

Explanation:

Given: $31 \times 5 + 16 - 4 \div 92$

On decoding the given equation:

Code	$\div$	$\times$	$+$	$-$
Meaning	$\times$	$+$	$-$	$\div$

$$31 \times 5 + 16 - 4 \div 92$$

$$\rightarrow 31 + 5 - 16 \div 4 \times 92$$

$$\rightarrow 31 + 5 - 4 \times 92$$

$$\rightarrow 31 + 5 - 368$$

$$\rightarrow 36 - 368$$

$$\rightarrow - 332$$

Hence, '- 332' is the correct answer.

50. Answer: a

Explanation:

The correct answer is JBS Haldane.

★ Key Points

- JBS Haldane:
 - **Haldane** was a professed **socialist, Marxist, atheist**, and **humanist** whose political dissent led him to **leave England** in **1956** and **live in India**,

becoming a **naturalized Indian citizen** in **1961**.

- JBS Haldane was born on 5 November 1892 was a British scientist.
- **Haldane's** article on abiogenesis in **1929** introduced the **primordial soup theory**, which became the **foundation** for the concept of the **chemical origin of life**.
- **Haldane** was one of the **three major figures** to develop the **mathematical theory of population genetics**, along with **Ronald Fisher** and **Sewall Wright**.

★ Additional Information

Person Name	Details
Charles Darwin	• Charles Robert Darwin was an English naturalist, geologist, and biologist, best known for his contributions to the science of evolution. • His proposition that all species of life have descended from common ancestors is now widely accepted and considered a fundamental concept in science.
Harold C. Urey	• Harold Clayton Urey was an American physical chemist whose pioneering work on isotopes earned him the Nobel Prize in Chemistry in 1934 for the discovery of deuterium.
Stanley N. miller	• Stanley Lloyd Miller was an American chemist who made landmark experiments in the origin of life by demonstrating that a wide range of vital organic compounds can be synthesized by fairly simple chemical processes from inorganic substances.

★ Important Points

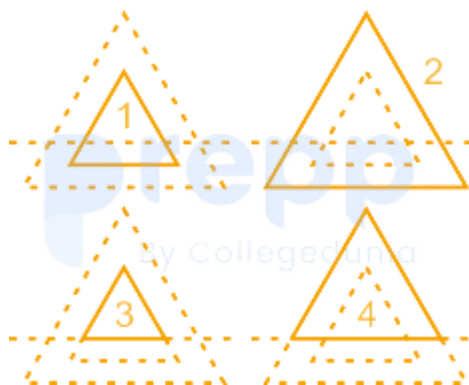
- Constitutional Provisions for Indian citizenship Articles are:

- The Constitution does not define the term 'citizen' but details of various categories of persons who are entitled to citizenship are given in Part 2 (Articles 5 to 11).
- **Article 5:** It provided for citizenship on commencement of the Constitution.
- **Article 6:** It provided rights of citizenship of certain persons who have migrated to India from Pakistan.
- **Article 7:** Provided Rights of citizenship of certain migrants to Pakistan.
- **Article 8:** Provided Rights of citizenship of certain persons of Indian origin residing outside India.
- **Article 9:** Provided that if any person voluntarily acquired the citizenship of a foreign State will no longer be a citizen of India.
- **Article 10:** It says that every person who is or is deemed to be a citizen of India under any of the foregoing provisions of this Part shall, subject to the provisions of any law that may be made by Parliament, continue to be such citizen.
- **Article 11:** It empowers Parliament to make any provision with respect to the acquisition and termination of citizenship and all matters relating to it.

51. Answer: c

Explanation:

The triangles in the given figure are as shown below.



Hence, there are 4 triangles in the given figure.

52. Answer: a

Explanation:

Given:

Amount = Rs. 15500

P = Rs. 12500

t = 6 years

Formula used:

$$S.I = (P \times t \times r)/100$$

Caculation:

$$\text{Interest} = 15500 - 12500 = \text{Rs. } 3000$$

$$SI \times 100/P \times t = (3000 \times 100)/(12500 \times 6) = 4\%$$

∴ The rate of interest is 4%

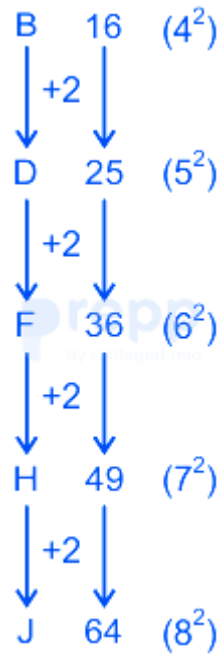
Your Personal Exams Guide

53. Answer: c

Explanation:

The logic followed here is:

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



Hence, 'J64' is the next term in the given series.

54. Answer: a

Explanation:

Prime numbers are those numbers that are only divisible by themselves and one.

So 97 is the only prime number between 90 and 100

∴ The sum is 97

55. Answer: c

Explanation:

Given:

There are 10 bars of 2 different weights

Statement : 1

$$10 \times 1/5 = 2$$

Weight of 2 bars = $2 \times 2 = 4$ kg [Half the weight is 2 kg]

So, the weight of 1st type bar is 2 kg

Statement : 2

$$8 \times 1/4 = 2$$

Weight of 2 bars = 0.5

Weight of 1 bar = 0.25 kg

So, the weight of 2nd type bar is 0.25 kg

But here we don't have any information about how many bars for type 1 and type 2

∴ **Statements 1 and 2 together are not sufficient**

56. **Answer: d**

Explanation:

The correct answer is Millet.

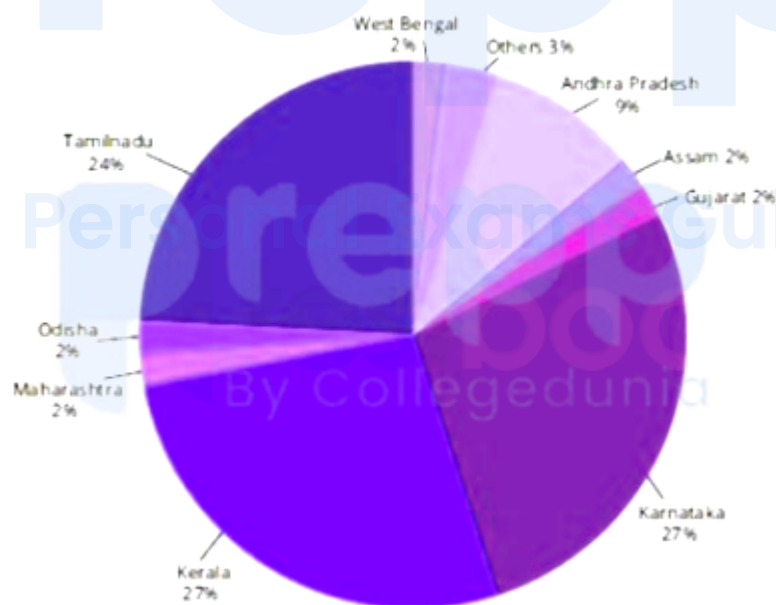
★ Key Points

- **Millet** is not a plantation crop.
- **Plantation Agriculture** is a term used to describe a form of agriculture where the output is sold for commercial purposes, not for personal consumption.
- It usually involves a large area growing a singular crop over a long duration.
- This type of agriculture is mainly found in tropical and subtropical areas of the world.
- Plantation Agriculture requires a large amount of labour and capital.
- Some of the examples of plantation crops include:
 - **Arecanut (betel nut)**,
 - **cardamom**,

- cashew,
- cocoa,
- coconut,
- coffee,
- oil palm,
- rubber, and
- tea

★ Additional Information

- The term **plantation crop** refers to those crops which are cultivated on an extensive scale in contiguous area, owned and managed by an individual or a company.
- Coconut, cashew nut, cocoa, areca nut, oil palm, and palm yrah come under the **Ministry of Agriculture** while tea, coffee, and rubber are dealt by **Ministry of Commerce**.
- Leading plantation crops producing states:



57. Answer: d

Explanation:

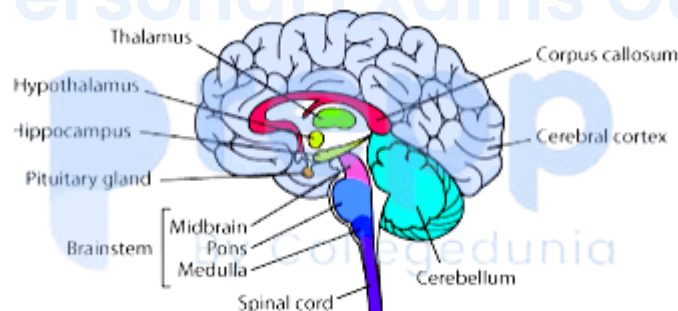
The correct answer is The cerebrum coordinates muscle activity.

★ Key Points

- The **cerebrum** is the **largest part** of the brain, constituting about **80% of it**.
- It consists of the cerebral cortex and other subcortical structures.
- A deep cleft divides the cerebrum longitudinally into two halves, which are termed the left and right **cerebral hemispheres**.
- It forms the anterior, superior and lateral sides of the brain i.e., the **fore, apex and side of the brain** respectively.
- The cerebrum is responsible for thinking, intelligence, consciousness, and memory.
- It is also responsible for interpreting touch, hearing, and vision.
- The forebrain consists of the cerebrum, thalamus, and hypothalamus.

★ Additional Information

- The **Cerebellum** controls things like posture, balance, **muscular activity**, and more.
- If the cerebellum is damaged, it could affect balance, slow movements, or produce tremors or shaking.
- The cerebellum is the second largest part of the brain, located in the posterior portion of the medulla and pons.



58. Answer: b

Explanation:

According to the pie chart,

We can see company B manufactured 30% in the year 2017 which is the highest among others,

$\therefore$ Company B manufactured the maximum number of tires.

59. Answer: b

Explanation:

Given:

$$3\sqrt{5} + \sqrt{125} = 17.85$$

Calculation:

$$3\sqrt{5} + \sqrt{125} = 17.85$$

$$\Rightarrow 3\sqrt{5} + 5\sqrt{5} = 17.85$$

$$\Rightarrow 8\sqrt{5} = 17.85$$

Now solve

$$\Rightarrow \sqrt{80} + 7\sqrt{5} = \sqrt{(16 \times 5)} + 7\sqrt{5}$$

$$\Rightarrow 4\sqrt{5} + 7\sqrt{5} = 11\sqrt{5}$$

$$\Rightarrow 11\sqrt{5} = 17.85 \times (11\sqrt{5}/8\sqrt{5})$$

$$\Rightarrow 11\sqrt{5} = 17.85 \times (11/8)$$

$$\Rightarrow 11\sqrt{5} = 24.53$$

$\therefore$ The value of $\sqrt{80} + 7\sqrt{5}$ is 24.53.

60. Answer: d

Explanation:

The logic followed here is:



- Here, there are two images a circle and a triangle intersecting each other in figure 1.
- In the next step both the images move apart and a circle is transformed into two concentric circles.

Similarly,



- In figure 3, two images, a rectangle and a circle intersecting each other are given.
- In the next step, both the images move apart and the figure which is on the upper side i.e. rectangle is transformed into two concentric rectangles.

Hence, the next picture in the given series will be the figure given in option 4.

61. Answer: c

Explanation:

The correct answer is K.K. Venugopal.

★ Key Points

- As of November 2021, the Attorney General of India is **K.K. Venugopal** .
- Venugopal was appointed the **15th AG** of India in **2017** . He succeeded **Mukul Rohatgi** who was AG from 2014–2017.

- The central government has extended the term of K.K. Venugopal as Attorney General (AG) for one more year in June 2021.
- This is the **second time** the Centre has extended his tenure. Venugopal received his first extension of term in 2020.

★ Additional Information

- Attorney General of India:
 - Attorney General of India is appointed by the President of India under Article 76.
 - Article 76 and 78 deal with the Attorney General of India.
 - He holds office during the pleasure of the President
 - The constitution has not fixed the remuneration of the AG.
 - He should be qualified to be appointed a judge of the Supreme Court
 - The Attorney General of India is the highest law officer in the country
 - The current Attorney General is K. K. Venugopal.
 - K. K. Venugopal is the 15 th Attorney General of India.
- The current Attorney General of India (16 th) – **R Venkataramani** (1st Oct. 2022).

62. Answer: c

Explanation:



The logic followed here is:

- In each figure A, B, and C, the image is divided into two equal parts and one of the parts is shaded whereas, in figure D more than half of the figure is shaded.

Hence, figure D is the odd one out of the given figures.

63. Answer: a

Explanation:

The correct answer is Echinodermata.

★ Key Points

- Starfish belongs to the phylum **Echinodermata** group.
- **Echinodermata** are so named owing to their spiny skin (from the Greek “echinos” meaning “spiny” and “dermos” meaning “skin”).
- Echinodermata are exclusively marine organisms. **Sea stars, sea cucumbers, sea urchins, sand dollars, and brittle stars** are all examples of echinoderms.



★ Additional Information

Your Personal Exams Guide

Phylum	Description
Annelida	- Annelida includes Earthworms, Leeches, Blister worms, etc. - They are triploblastic, bilaterally symmetrical schizocoelomate protostomes. - In Annelida, the body is divided into three regions: prostomium, trunk, and pygidium.
Porifera	- Porifera includes organisms with holes. Example – (a) Sycon (b) Euspongia (c) Spongilla. - They are commonly called sponges.
Nematoda	- Their body is bilaterally symmetrical and triploblastic. They are cylindrical in shape. - Examples – ascarids (Ascaris), filariasis, hookworms, pinworms (Enterobius), and whipworms (Trichuris trichiura)

64. Answer: a

Explanation:

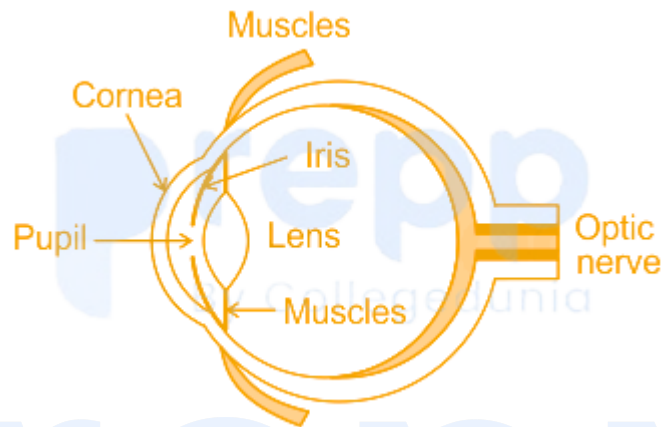
The correct answer is Real and inverted.

★ Key Points

- The image formed on the retina of the human eye is **real and inverted**.
- The retina comprises specialized cells that are sensitive to light, known as **rod and cone cells**.
- These cells get stimulated and send signals to the **brain** which turns them into erect images that allow us to see.

★ Additional Information

- The lens system of an eye forms an image on a light-sensitive screen known as the **retina**.
- Light enters the eye through a thin membrane known as the **cornea**.
- Behind the cornea, there is a structure, known as the **iris**. It has a major function to control the size of the pupil.



65. Answer: b

Explanation:

According to the bar graph,

In 2012 total of 50 Lakhs computers were sold

1 million = 10 lakhs

so 50 lakhs = 5 millions

∴ 5 million personal computers were sold by Company XYZ in 2012

66. Answer: c

Explanation:

- The statement says that he got on a bus on Wednesday, to go to Hyderabad.

- Thus it cannot be determined whether he reached Hyderabad on the very same day, or the next day or exactly when. Thus, assumption I is not implicit.
- Since it is given that he caught the bus to go to Hyderabad for an event that was on Saturday, it is safe to assume that he would try to reach there before the event ends. Thus, Assumption II is implicit.

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

67. Answer: d

Explanation:

The correct answer is 48 kilogram.

★ Key Points

- In **November 2017**, India's **Ritu Phogat** won a **silver medal** in the Under **23 Senior World Wrestling Championship** held in Poland. She has won the silver in the **48 kg category**.
- She lost against **Turkish Wrestler Demirhan** in the final and won the Silver medal.
- Ritu had won the National championship in Indore in 2017. She also won a bronze medal at the Asian Championships in May 2017.

★ Additional Information

- Ritu Phogat is also a female wrestler who won a **gold medal at the 2016 Commonwealth Wrestling Championship**.
- In November 2016, she won the gold medal at the 2016 **Commonwealth Wrestling Championship in Singapore** in the 48 kg category.
- In October 2016, Phogat won her second consecutive title at the annual **National Wrestling Championships**.

68. Answer: d

Explanation:

The correct answer is Calcium.

★ Key Points

- **Calcium** is not from the class of alkali metals.
- Calcium (Ca) is one of the **alkaline-earth metals** of **Group 2 (IIa)** of the periodic table.
- Calcium is a chemical element with the symbol Ca and **atomic number 20**.
- It is the most abundant mineral in the body, and it is vital for bone health.
- Humans need calcium to build and maintain strong bones, and 99% of the body's calcium is in the bones and teeth.

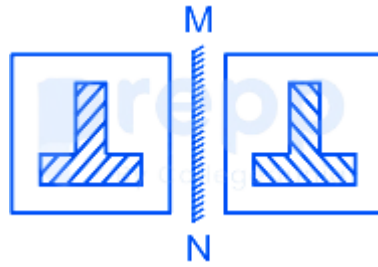
★ Additional Information

- Alkali elements are **Lithium (Li), Sodium (Na), Potassium (K), Rubidium (Ru), Cesium (Cs) and Francium (Fr)** occupying successive periods from first to seven.
- The compounds are called **alkali metals** because when they react with water they usually form alkalies which are nothing but strong bases that can easily neutralize acids.
- Alkali metals belong to the **s-block elements** occupying the leftmost side of the periodic table.

69. Answer: b

Explanation:

The mirror image of the given figure is as follows:



Hence, the mirror image of the given figure will be answer figure C.

(Note: In original paper this question has discrepancy. The lines within the figure D in question had to be changed. The lines will be as per the figure given above.)

70. Answer: b

Explanation:

Given:

Length of the rhombus, $(a) = \sqrt{5} \text{ cm}$

Area of rhombus, $(A) = 4 \text{ cm}^2$

Formula used:

$$A = \frac{1}{2} \times d_1 \times d_2$$

By Pythagoras theorem - $4a^2 = d_1^2 + d_2^2$

Calculation:

According to the question

$$A = \frac{1}{2} \times d_1 \times d_2$$

$$\Rightarrow 2A = d_1 d_2$$

Now,

$$(d_1 + d_2)^2 = d_1^2 + d_2^2 + 2d_1 d_2$$

$$\Rightarrow (d_1 + d_2)^2 = 4a^2 + 2 \times 2A$$

$$\Rightarrow (d_1 + d_2)^2 = 4a^2 + 4A$$

$$\Rightarrow (d_1 + d_2)^2 = 4 \times (\sqrt{5})^2 + 4 \times 4$$

$$\Rightarrow (d_1 + d_2)^2 = (4 \times 5 + 16)$$

$$\Rightarrow (d_1 + d_2)^2 = (20 + 16)$$

$$\Rightarrow (d_1 + d_2)^2 = 36$$

$$\Rightarrow d_1 + d_2 = 6 \text{ cm}$$

$\therefore$ The sum of the length of the diagonals is 6 cm

71. Answer: d

Explanation:

The correct answer is Wrestling.

★ Key Points

- Satyawart Kadian is associated with **wrestling sports**.
 - He was born on **9th November 1993**, in **Rohtak, Haryana, India**.
- The Achievements of Satyawart Kadian:
 - A **bronze medal** in the **100 kg** category at the **2010 Youth Olympic Games**, held in **Singapore**.
 - Earned a **bronze medal** in the **96 kg** category at the **World Junior Championships** in **2013** that took place in **Sofia**.
 - Bagged **silver** and a **bronze medal** in the **97 kg** category at the **Commonwealth Games** and **Asian Championships** of **2014**.
 - Won the title at the **1st Rustam-e-International tournament** which was held at **Jammu** in **2015**.
 - Clinched a gold medal in the **97 kg** category at the **Commonwealth Championships** of **2016**, held in **Singapore**.

- Claimed a **bronze medal** in the **97 kg category** at the **2019 Asian Championships**.

★ Additional Information

Sports Name	Details
Hockey	• Hockey is a term used to denote various types of both summer and winter team sports which originated on either an outdoor field, sheet of ice, or dry floor such as in a gymnasium. • The first Hockey Association was formed in the UK in 1876 and drew up the first formal set of rules.
Kabaddi	• Kabaddi is a contact team sport. • It was introduced about 4000 years ago in Tamil Nadu, India. Played between two teams of seven players. • Kabaddi was played as a demonstration event at the First Asian Games in 1951, and again in 1982, before becoming a medal event for the first time in 1990.
Football	• Football is a family of team sports that involve, to varying degrees, kicking a ball to score a goal. • In football, only the goalkeeper is permitted to handle the ball and may do so only within the penalty area surrounding the goal. •
Wrestling	• Wrestling is a combat sport involving grappling-type techniques such as clinch fighting, throws and takedowns, joint locks, pins, and other grappling holds. • The three basic types of wrestling contest are the belt-and-jacket, catch-hold, and loose styles.

72. Answer: d

Explanation:

Given:

Principal = Rs. 20,000

CI – SI = Rs. 800

Time = 2 years

Formula used:

$$SI = (P \times R \times T)/100$$

$$CI = P [(1 + r/100)^n - 1]$$

Calculation:

Let the rate be r

According to the question

$$SI = (20,000 \times r \times 2)/100$$

$$\Rightarrow CI = 20,000 [(1 + r/100)^2 - 1 - 2r/100] = 800$$

$$\Rightarrow 20,000(r^2/10000) = 800$$

$$\Rightarrow 2r^2 = 800\%$$

$$\Rightarrow r^2 = 400\%$$

$$\Rightarrow r = 20\%$$

$\therefore$ The value of r is 20%

73. Answer: b

Explanation:

From the given statement, it is clear that Nayan joined the local football team in 2014, and that he helped the team to win 3 championships.

- Winning the 3 championships between 2016 and 2018 for the first time ever can be said to have led the team to reach new heights because it is mentioned that his Nayan's joining had helped the team win. Thus, conclusion I follows.
- Helping the team win 3 championships is not possible unless you are a good player. Winning a championship because of a player indicates that he has made a significant contribution. Nayan has been accredited for the teams' 3 victories. Winning directly implies success. So we can say that conclusion II follows.

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

74. Answer: c

Explanation:

Given:

Speed of cycling = 10 km/hr

Speed of walking = 3 km/hr

Total time taken to cover 45 km = 8 hours

Concept used:

Distance = Speed $\times$ Time

Calculation:

Let the time for which Ramakant do cycling be x hr

Time for which Ramakant do walking = $(8 - x)$ hr

According to the question,

$$\Rightarrow 10 \times x + 3 \times (8 - x) = 45$$

$$\Rightarrow 10x + 24 - 3x = 45$$

$$\Rightarrow 7x = 21$$

$$\Rightarrow x = 3 \text{ hr}$$

Distance covered by cycle = (10×3) km/hr

$$\Rightarrow 30 \text{ km/hr}$$

$\therefore$ Required distance covered by cycle is 30

75. Answer: a

Explanation:

Concept Used: Your Personal Exams Guide

Volume of Cuboid = $L \times B \times H$

Calculation:

Let the dimensions of the boxes be L , B and H respectively

Original Volume = LBH

New dimension after increasing the dimensions by half of the original size = $(1.5L \times 1.5B \times 1.5H)$

New volume = $3.375LBH$

Required percentage = $(3.375LBH/LBH) \times 100\%$

$\Rightarrow 337.5\%$

$\therefore$ Required percentage is 337.5%

76. Answer: d

Explanation:

The correct answer is 175 J.

Concept:

- Kinetic energy (K.E): The energy possessed by a body by the virtue of its motion is called kinetic energy.

The expression for kinetic energy is given by:

$$KE = \frac{1}{2}mv^2$$

Where m = mass of the body and v = velocity of the body

- Momentum (p) : The product of mass and velocity is called momentum.

Momentum (p) = mass (m) $\times$ velocity (v)

The relationship between the kinetic energy (KE or k) and Linear momentum is given by:

As we know,

$$KE = \frac{1}{2}mv^2$$

Divide numerator and denominator by m, we get

$$KE = \frac{1}{2} \frac{m^2 v^2}{m} = \frac{1}{2} \frac{(mv)^2}{m} = \frac{1}{2} \frac{p^2}{m} \quad [p = mv]$$

$$\therefore KE = \frac{1}{2} \frac{p^2}{m}$$

$$p = \sqrt{2mKE}$$

Calculation:

Given, Mass = 14 kg

velocity = 5 ms⁻¹

We know that,

$$\text{Kinetic energy} = \frac{1}{2} \times mv^2$$

$$\text{Kinetic energy} = \frac{1}{2} \times 14 \times 5^2 = 7 \times 25 = 175 \text{ J}$$

77. Answer: b

Explanation:

The correct answer is Strong acid and strong base.

★ Key Points

- Strong acid and strong base neutralise each other and make a neutral salt solution which carry pH 7.
- For example NaOH strong base mix with Strong Acid HCl form a neutral salt NaCl.
- This is an ordinary salt used in cooking.
- Salts of a strong acid and a strong base are neutral with pH value of 7.
- On the other hand, salts of a strong acid and weak base are acidic with pH value of less than 7
- and those of a strong base and weak acid are basic in nature, with pH value of more than 7.

★ Additional Information

- pH is defined as the negative logarithm of H⁺ ion concentration . Hence the meaning of the name pH is justified as the power of hydrogen.
- Solutions having a value of **pH ranging 0 to 7** on the pH scale are termed as **acidic** and the **value of pH ranging 7 to 14** on the pH scale are known as **basic**

solutions.

- Pure water has a pH value of 7 .
 - The basicity decreases as the value of pH decreases from 14 to 7.
-

78. Answer: a

Explanation:

The correct answer is Bhangar.

★ Key Points

- Old alluvial soil is known as **Bhangar** and is full of Kankars (lime nodules).
- The Bhangar is the older alluvium along the river beds forming terraces higher than the floodplain.
- Bhangar contains **fossils** of animals like rhinoceros, hippopotamus, elephants, etc.
- This type of soil is found in mountainous regions. This type of soil is found in huge amount in the **North Indian Plains** .

★ Additional Information

Your Personal Exams Guide

Type of soil	Description
Regur	- The parent material for most of the black soil is the volcanic rocks that were formed in the Deccan Plateau (Deccan and the Rajmahal trap). - It is also known as black soil.
Clay	Clay Soil is a heavy soil type that benefits from high nutrients.
Khadar	The Khadar is composed of newer alluvium and forms the flood plains along the river banks. - A new layer of alluvium is deposited by river floods almost every year. It is very fertile.

79. Answer: c

Explanation:

Given:

X is the number of leap years in an interval of 100 years

Concept used:

Leap year – A year occurring once every four years

Calculation:

According to the question

Divide the given year by 4 we get,

⇒ (100/4)

$\Rightarrow 25$

But, 100 is not a leap year

So, $(25 - 1) = 24$

Now,

$(x - 1) = (24 - 1)$

$\Rightarrow 23$

$\therefore$ The required value is 23

80. Answer: d

Explanation:

Given:

Principal = Rs. 22,500

Rate = 6%

Time = 2 years

Formula used:

$$SI = (P \times R \times T)/100$$

$$\text{Amount} = P \left[\left(1 + \frac{r}{100} \right)^n \right]$$

$$CI = \text{Amount} - \text{Principal}$$

Calculation:

$$SI = (22,500 \times 6 \times 2)/100$$

$\Rightarrow 2700$

Now,

According to the question

$$\text{Amount} = 22,500 \left[\left(1 + \frac{6}{100} \right)^2 \right]$$

$$\Rightarrow (22,500 \times 53/50 \times 53/50)$$

$$\Rightarrow (9 \times 53 \times 53)$$

$$\Rightarrow \text{Rs. } 25,281$$

$$\text{CI} = \text{Amount} - \text{Principal}$$

$$\Rightarrow (25,281 - 22,500)$$

$$\Rightarrow 2781$$

Now,

$$\text{Profit} = (2781 - 2700)$$

$$\Rightarrow 81$$

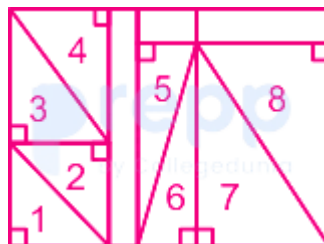
$\therefore$ The required profit is 81

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81. Answer: c

Explanation:

The right angled triangles in the given figure are as shown below.



Hence, there are 8 right-angled triangles in the given figure.

82. Answer: a

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:

$$(2 + 5) \times 4 + (4/2) = ?$$

$$\Rightarrow 7 \times 4 + 4/2 = ?$$

$$\Rightarrow 28 + 4/2 = ?$$

$$\Rightarrow 28 + 2 = ?$$

$$\Rightarrow 30 = ?$$

∴ The value of ? is 30

83. Answer: c

Explanation:

The correct answer is Balakrishna Doshi.

★ Key Points

- **Balakrishna Doshi** became the **first Indian to win** the prestigious **Pritzker Prize** for his outstanding lifelong contribution to architecture, in **March 2018**.
- He was awarded the year's **Pritzker Prize** for being able to interpret architecture and transform it into buildings that respect Eastern culture.
- **Pritzker Prize** is regarded as **architecture's equivalent to the Nobel Prize**.

★ Additional Information

About Pritzker award:

- **Pritzker award** is awarded each year to a living architect/s for significant achievement, was established by the Pritzker family of Chicago through their **Hyatt Foundation in 1979**.
- It is granted annually and is often referred to as **"architecture's Nobel"** and **"the profession's highest honor."**
- The award consists of **\$100,000 (US)** and a **bronze medallion**.
- The award is conferred on the laureate/s at a ceremony held at an architecturally significant site throughout the world.

84. Answer: b

Explanation:

The correct answer is Law of conservation of energy.

★ Key Points

- **Energy can neither be created nor destroyed**, but it can be converted into one another. It is called the **Law of conservation of energy**.
- **The law of conservation of energy** states that "In a closed system, i.e., a system that is isolated from its surroundings, the total energy of the system is conserved."

★ Additional Information

- Example of the **law of conservation of Energy** :

Action	Change in energy
A ball tossed up in the air	Chemical energy from your muscles → kinetic energy of the ball.
A skier slides down a hill	the gravitational potential energy of the skier → kinetic energy of the skier + thermal energy of the snow and skies (from friction).
A compressed spring launches a ball in a pinball game	The elastic potential energy of the spring → kinetic energy of the ball.
As the pendulum swings down	the gravitational potential energy of the pendulum → kinetic energy of the pendulum.

85. Answer: d

Explanation:

Given:

Time taken by Mary to complete one round = 30 min

Time taken by Sila to complete one round = 45 min

Both of them walking in the same direction at 9 o'clock

Concept used:

1 hour = 60 min

Calculation:

According to the question

LCM of 30 and 45

$$\Rightarrow 2 \times 3 \times 3 \times 5$$

$\Rightarrow 90 \text{ min}$

$\Rightarrow 1 \text{ hr } 30 \text{ min}$

They will meet again at the starting point = $(9 + 1 \text{ hr } 30 \text{ min})$

$\Rightarrow 10 \text{ hr } 30 \text{ min}$

$\therefore$ The required time taken to meet them is 10:30 am

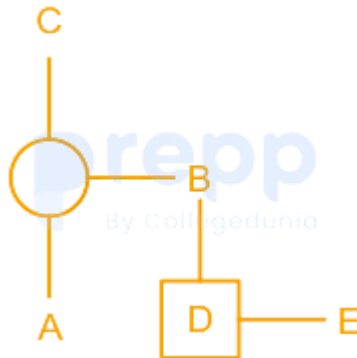
86. Answer: b

Explanation:

Preparing the family tree using the following symbols:

Symbol in Diagram	Meaning
	Female
	Male
	Married Couple
	Siblings
	Difference of A Generation

- A's mother is B's sister and C's daughter.
- D is the son of B and brother of E.



Here, gender of C is not specified. Therefore, C can be either grandfather or grandmother of E.

Hence, 'Grandmother or grandfather' is the correct answer.

87. Answer: b

Explanation:

The correct answer is Boat.

★ Key Points

- The **class Reptilia** comprises three major groups of extant vertebrates turtles, crocodilians, and squamates (lizards and snakes).
 - **Reptiles** are cold-blooded vertebrates. (Vertebrates have backbones.) They have **dry skin** covered with **scales** or **bony plates** and usually lay **soft-shelled eggs**.
 - **Reptiles** are air-breathing vertebrates covered in special **skin** made up of **scales, bony plates**, or a combination of both.

★ Additional Information

- A **boat** is a watercraft of a large range of **types** and **sizes**, but generally smaller than a *ship*, which is distinguished by its **larger size, shape, cargo or passenger**

capacity, or its ability to carry boats.

- **Small boats** are typically found on **inland waterways** such as **rivers** and **lakes**, or in protected **coastal areas**.

88. Answer: d

Explanation:

The correct answer is Valency.

★ Key Points

- The **valence power** (potential) of an element is called **valency**.
 - The **valence** is known as an **element's combining power**. Some elements vary in their ability to interact with other **elements**, depending on the nature of the reaction.
 - **Valency** is the combining **capacity** of an **element**.
 - The number of electrons donated or accepted by an atom of an element so as to have an electronic configuration of the nearest noble gas is called its **valency**.

★ Additional Information

Valency Table

transition metals

Members of this group of metals display a number of valencies

+1	+2							-4 or -3	-2	-1	0
H	He							Ne			
Li	Be							Ar			
Na	Mg							Kr			
K	Ca							Xe			
Rb	Sr							Rn			
Cs	Ba										
Fr	Ra										

1 group 2 group 3 group 4 group 5 group 6 group 7 group 8 group

89. Answer: c

Explanation:

- Pencils with Seema on Monday = 15
- Pencils on Tuesday = $15 + 5$ (given by brother) = 20
- Pencils on Wednesday = $20 - 3$ (taken by brother) = 17
- Pencils on Thursday = $17 + 7$ (given by friend) = 24
- Pencils on Friday = $24 + 5$ (given by brother) = 29
- No pencil was given or taken on Saturday.
- Therefore, pencils on Saturday = pencils on Friday = 29

Hence, **29** is the correct answer.

90. Answer: c

Explanation:

Given:

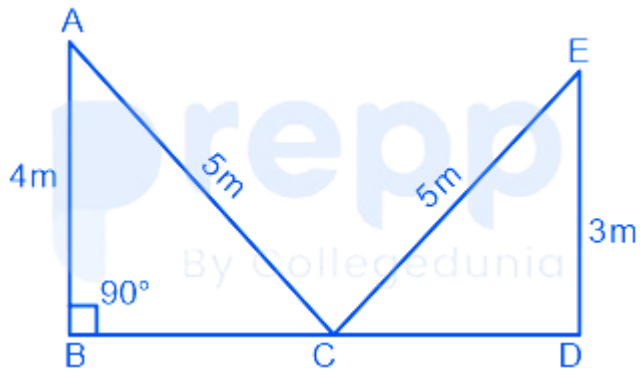
A 5 m long stair with a stable base on the street

Sides of two windows = 4 m and 3 m

Formula used:

$$\text{Base}^2 = \text{Hypotenuse}^2 - \text{Perpendicular}^2$$

Calculation:



In $\triangle ABC$

$AB = 4 \text{ m}$ and $AC = 5 \text{ m}$

By pythagoras theorem

$$BC^2 = AC^2 - AB^2$$

$$\Rightarrow BC^2 = (5)^2 - (4)^2$$

$$\Rightarrow BC^2 = (25 - 16)$$

$$\Rightarrow BC^2 = 9$$

$$\Rightarrow BC = 3 \text{ m}$$

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In $\triangle EDC$

$ED = 3 \text{ m}$ and $EC = 5 \text{ m}$

By pythagoras theorem

$$CD^2 = EC^2 - ED^2$$

$$\Rightarrow CD^2 = (5)^2 - (3)^2$$

$$\Rightarrow CD^2 = (25 - 9)$$

$$\Rightarrow CD^2 = 16$$

$$\Rightarrow CD = 4 \text{ m}$$

Now,

$$BD = BC + CD$$

$$\Rightarrow BD = (3 + 4) \text{ M}$$

$$\Rightarrow BD = 7 \text{ m}$$

$\therefore$ The width of the road is 7 m

91. Answer: a

Explanation:

The logic followed here is:\

- In one minute, minute hand moves = $360 / 60 = 6^\circ$
- In one hour, hour hand moves = $360 / 12 = 30^\circ$
- In one minute hour hand moves = $30 / 60 = 1/2^\circ$
- So, the relative distance between both the hands in one minute = $6^\circ - 1/2^\circ = 5\frac{1}{2}^\circ$
- In other words, in one minute, the minute hand gains $5\frac{1}{2}^\circ$ more than hour hand.
- In one hour the gain will be = $5\frac{1}{2}^\circ \times 60 = 330^\circ$
- In other words, the minute hand will gain [$330 / 6 = 55$] 55 minutes to the hour hand. or the minute hand moves by 55 minutes in an hour.

Hence, '55' is the correct answer.

92. Answer: a

Explanation:

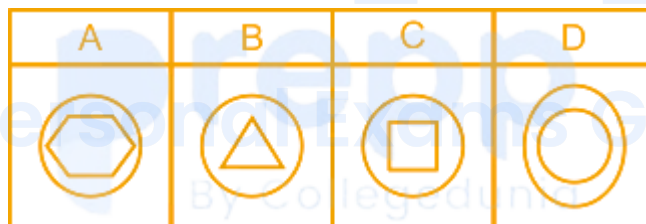
The given statement asks whether student organizations should be banned or not.

- Argument I suggests that students and organizations are two separate entities.
- It claims that banning is the **only way** to put a stop to the aggression of the organizations.
- However, there is a cause for every problem. There must be a reason behind the aggression of student organisations.
- Addressing the concerns of the organization would be one of the ways as well as a good choice instead of taking an extreme step like banning them. Therefore, argument I is not strong.
- Argument II is strong because it is a democratic right of the students to form organizations and banning them will be against these rights. Thus, only argument II is strong.

So, the correct answer is **option 1**.

93. Answer: b

Explanation:



The logic followed here is:

- In each figure A, B and C there are two images; a circle and a polygon present within the circle.
- Also, both the images are different. Whereas, in figure D there are two images but both are same i.e circle.

Hence, figure D is the odd one.

94. Answer: c

Explanation:

Given:

Distance covered by Kishan = 96 km

Speed decreases by cycle = 4 km

Time taken by Kishan 2 hours more

Formula used:

Distance = Speed $\times$ Time

Calculation:

Let kishan's speed be x km/hr

Distance covered = 96 km

$\Rightarrow$ Time taken = $96/A$

If he cycled 4 km slower every hour, he would have taken 2 more hours

$\Rightarrow$ Speed would have been = $(A - 4)$

$\Rightarrow$ Time taken = $96/A - 4$

$\Rightarrow 96/(A - 4) - 96/A = 2$

$\Rightarrow 192 = A^2 - 4A$

$\Rightarrow A^2 - 4A - 192 = 0$

$\Rightarrow A^2 - 16A + 4A - 192 = 0$

$\Rightarrow A(A - 16) + 12(A - 16) = 0$

$\Rightarrow (A + 12)(A - 16) = 0$

$$\Rightarrow A = -12, 16$$

$\therefore$ The required speed at which Kishan actually cycled is 16 km/h

95. Answer: d

Explanation:

The correct answer is ms⁻².

★ Key Points

- SI unit of **acceleration** is **ms⁻²**.
 - **Acceleration** is defined as the **rate** of change of **velocity** with respect to time.
 - A **body's acceleration** is the final result of all the forces being applied to the body, as defined by **Newton's second law**.
 - **Acceleration** is a **vector quantity** that is described as the **frequency** at which a **body's velocity changes**. It is also the second derivative of position with respect to time or it is the first derivative of velocity with respect to time.

★ 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 traveling 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 traveling 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.

96. Answer: a

Explanation:

The correct answer is Nepal.

★ Key Points

- The Arun-III hydropower plant is being developed on the Arun River in Sankhuwasabha District of **Province 1, East Nepal**.
- It is an export-oriented project with a power generation capacity of **900MW**.
- The estimated to cost more than **\$1.6bn**, the hydropower plant will produce **4,018.87 million units** of electricity a year.

★ Additional Information

- It is being developed on a **build-own-operate and transfer (BOOT)** basis by **Satluj Jal Vidyut Nigam (SJVN)**.
- **SJVN** was established in **2013** with an aim to plan, promote, organize and execute the **Arun-III power plant**.
- The hydropower plant construction commenced in **May 2018** and completion is **scheduled for 2023**.

97. Answer: a

Explanation:

The correct answer is Distance.

★ Key Points

- An **odometer** is a device that is used for measuring the **distance traveled by a vehicle** .
- The **odometer** is usually situated in the vehicle's dashboard.
- The word "**odometer**" is derived from two Greek words meaning **path and measure** .
- **Odometer** is also used by **people who construct roads and survey lands**.



★ Additional Information

Device	Description
Speedometer	It is the device used in a vehicle to measure the speed of that vehicle.
Barometer	It is a scientific instrument used to measure atmospheric pressure, also called barometric pressure.
Olfactometer	It is an instrument used to detect and measure odor dilution

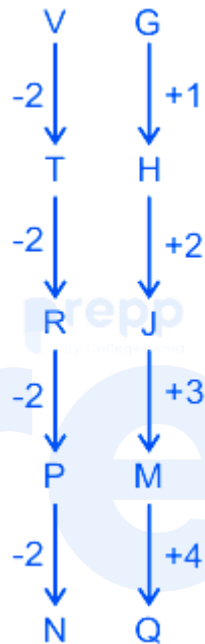
98. Answer: a

Explanation:

The place value table is as follows:

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:



Hence, 'NQ' will be the next letter pair of the given series

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99. Answer: c

Explanation:

Given:

The LCM of 108, 135 and 162 = P

Concept used:

LCM –The smallest common multiple of two or more numbers.

Calculation:

LCM of 108, 135 and 162 = P

$$\Rightarrow 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 5 = P$$

$$\Rightarrow 1620 = P$$

Now,

$$\text{The value of } P \div 4 = (1620 \div 4)$$

$$\Rightarrow 405$$

$\therefore$ The required value is 405

100. Answer: d

Explanation:

The correct answer is CaCl₂.

★ Key Points

- If the **weather is very humid**, you will have to remove the emitted gas through a dry tube containing anhydrous calcium chloride **CaCl₂**.
- **Anhydrous CaCl₂** absorbs moisture to keep the **gas in the dry state**
- **Calcium Chloride** is a **hygroscopic salt** i.e. it absorbs moisture from the surroundings.

★ Additional Information

Gas	Description
Ca(OH)_2	Calcium hydroxide, also called slaked lime , Ca(OH)_2 , is obtained by the action of water on calcium oxide.
NaCl	Sodium chloride (NaCl) , also known as salt, is an essential compound our body uses to: absorb and transport nutrients. maintain blood pressure.
NaOH	Sodium hydroxide (Na OH), also known as lye or caustic soda, is a caustic metallic base. It is used to produce soaps, rayon, paper, products that explode, dyes, and petroleum products.

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