



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 (26-Sep-2018) (Shift 3)

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. When sodium sulphate solution is mixed with barium chloride solution, then (+1, -0.33)

- a. there is no reaction
- b. sulfur dioxide is formed
- c. barium chloride is formed
- d. barium sulfate is formed

2. $52 \div [36 - \{24 - (32 - 54 \div 9 \times 3)\}] = ?$ (+1, -0.33)

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

3. What are the special features of the following group of elements? (+1, -0.33)

- 1. All these elements are metals
- 2. All these elements react with water to form hydrogen gas
- 3. All these elements have a valency 1

- a. Halogen group
- b. Alkali metal group
- c. Alkaline earth metal group

d. Alkali Metals and Halogen Groups

4. Janki and Mansi, working separately, can paint a wall in 45 and 72 days respectively. They started working together but Janki left the work 33 days before the completion of the work. In total, how many days did it take to complete the work? (+1, -0.33)

- a. 49
 - b. 48
 - c. 46
 - d. 47
-

5. Which of the following novels by Salman Rushdie was released in 2017? (+1, -0.33)

- a. The Golden House
 - b. The sellout
 - c. The Satanic Verses
 - d. Midnight children
-

6. Find the next number in the following series? (+1, -0.33)

10, 30, 29, 49, _____

- a. 36
- b. 48
- c. 37

d. 35

7. Find the next number in the following series?

(+1, -0.33)

320, 290, 260, _ _ _ _ _

- a. 190
- b. 230
- c. 170
- d. 200

8. Identify the odd one out:

(+1, -0.33)



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

9. In a real sense, free fall only occurs in:

(+1, -0.33)

- a. Sea
- b. Vacuum

- c. Wind
- d. Atmosphere

10. $(-7)[60 \div \{6 - (-4)\}] \div [(-2)\{19 - (-2) \times (-6)\}] = ?$ (+1, -0.33)

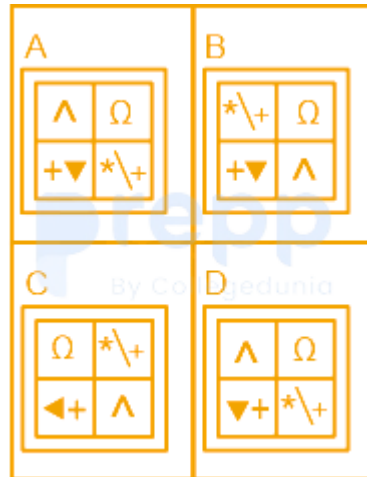
- a. 0
- b. 2
- c. 1
- d. 3

11. In a circuit resistors are connected in series, the value of current through the circuit is: (+1, -0.33)

- a. remains the same
- b. increases
- c. decreases
- d. becomes half

12. Study the pattern of the following figures and decide which figure will be the next one. (+1, -0.33)





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

13. Which the first film made in the dialect of Himachal has gained international recognition for the first time, winning the Best Feature Film award at the International Borrego Springs Film Festival in California, USA in the year 2017? (+1, -0.33)

- a. Saaransh
- b. Samjhauta
- c. Samay
- d. Saanjh

14. Which of the following is India's indigenously designed and developed long-range subsonic cruise missile? (+1, -0.33)

- a. Helena
- b. Pinaka
- c. Naag
- d. Nirbhay

15. Who was honored with the Dadasaheb Phalke Award for the year 2016? (+1, -0.33)

- a. K.J. Yesudas
- b. S.S. Rajamouli
- c. K. Vishwanath
- d. K. Bala Chander

16. The following statement is followed by two arguments. You have to decide which of the arguments are strong with respect to the statement. (+1, -0.33)

Question:

Is there any solution to avoid noise pollution in urban areas?

Argument:

I. Yes, residential areas should be separated from commercial areas such as hotels, restaurants and wedding halls.

II. No, it is part and parcel of urbanization, we cannot escape it.

- a. Arguments I and II both are strong
- b. Only argument I is strong

- c. Only argument II is strong
- d. Neither argument I nor argument II is strong

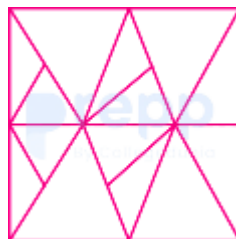
17. The mean score of a group of 12 members was 10 while the mean score of another group with n members was 12. If the combined average of both is 11.2 then what was the value of n ? (+1, -0.33)

- a. 18
- b. 30
- c. 16
- d. 24

18. Sharda is the granddaughter of Surya and Kiran is the only son of Surya, then how is Sharda related to Kiran? (+1, -0.33)

- a. Aunt
- b. Daughter
- c. Mother
- d. Cousin Sister

19. How many triangles are there in this figure? (+1, -0.33)



- a. 19
 - b. 17
 - c. 18
 - d. 20
-

20. _____ is essential for the synthesis of thyroxine. (+1, -0.33)

- a. Iron
 - b. Iodine
 - c. Sodium
 - d. Calcium
-

21. What is the full form of FICCI? (+1, -0.33)

- a. Federal Indian Chamber of Commerce
 - b. Federation of Indian Chamber of Commerce and Industry
 - c. Free India Chamber of Commerce International
 - d. Federation of Indian Committee for Conciliation India
-

22. Mendel's laws apply only when: (+1, -0.33)

- a. Parents are pure breeding
- b. Parent is codominant

- c. Characters are recessive
 - d. Characters are linked
-

23. _____ softens the bone surface at the joint. (+1, -0.33)

- a. Cartilage
 - b. Areolar
 - c. Tendon
 - d. Bondage
-

24. Calcium sulfate hemihydrate is also known as: (+1, -0.33)

- a. Baking powder
 - b. Baking soda
 - c. Washing soda
 - d. Plaster of Paris
-

25. $(12 - 1)$ of $(16 + 15) \times (119 + 113 - 16) = ?$ (+1, -0.33)

- a. 73656
 - b. 73660
 - c. 73600
 - d. 73650
-

26. What will be the horizontal mirror image of 'PUMP'?

(+1, -0.33)



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

27. In a computer game, a builder can build a wall in 5 hours while a destroyer can completely destroy it in a total of 7 hours. The builder and the destroyer begin work together on level ground. But after 3.5 hours, the destroyer is put out of work. What is the total time (in hours) required to build the wall?

(+1, -0.33)

- a. 7.5
- b. 8.5
- c. 17.5
- d. 12

28. A statement is followed by two arguments. You have to decide which of the arguments are/are strong with respect to the statement.

(+1, -0.33)

Statements:

Should doctors suggest walking as an alternative medicine exercise for diabetics?

Arguments:

- I. Yes, it has been proved that by walking regularly, good hormones are produced in sufficient quantity which keep diseases away.
- II. No, because due to the busy schedule, not everyone may be able to go out for a walk in the morning.

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

29. Deepu wants to reduce the consumption of milk in the ratio 9 : 5. His present milk consumption is 18 liters. Find his lesser consumption. (+1, -0.33)

- a. 16 liters
- b. 1 liters
- c. 14 liters
- d. 10 liters

30. An object travels 24 meters in 4 seconds and then another 15 meters in 2 seconds. What is the average speed of the object? (+1, -0.33)

- a. 6.5 m
- b. 6.5 ms^{-1}

c. 6.7 ms^{-1}

d. 6.67 s^{-1}

31. What was the real name of Sher Shah Suri or Sher Khan?

(+1, -0.33)

a. Farid

b. Jamaal

c. Jalal-Ud-Din

d. Abul-Fath

32. The current-voltage graph of ohmic devices is of the form:

(+1, -0.33)

a. Parabolic curve

b. Bi-linear curve

c. Non-linear curve

d. Linear curve

33. Morris used to spend 25% of his income on food. He got an increment of one thousand rupees, but he did not increase his expenditure on food items. As a result, his expenditure on food fell to 20%. What was his initial income?

(+1, -0.33)

a. Rs. 6500

b. Rs. 6000

c. Rs. 5000

d. Rs. 4000

34. Rs. 88 is divided between Jayati and Prateek in the ratio of 5 : 6. How much money did Jayati get? (+1, -0.33)

a. Rs. 40

b. Rs. 48

c. Rs. 56

d. Rs. 52

35. There are 7 periods and 18 groups in the _____ classification. (+1, -0.33)

a. Mendeleev's periodic table

b. Modern periodic table

c. Newland's Octavus

d. Dobereiner's triad

36. The mines of Jadugoda are famous for _____. (+1, -0.33)

a. Uranium

b. Copper

c. Gold

d. Iron

37. _____ is the lightest metal. (+1, -0.33)

- a. Ca
 - b. Li
 - c. P
 - d. He
-

38. _____ is the main component of cement. (+1, -0.33)

- a. MgOH
 - b. CaCO_3
 - c. SiO_2
 - d. MnO
-

39. An element with electronic frequency 2, 8, 8 is placed in the group _____ in the modern periodic table. (+1, -0.33)

- a. 8
 - b. 2
 - c. 18
 - d. 17
-

40. The change in the speed of light when enter to denser medium is: (+1, -0.33)

- a. Dispersion index
 - b. Refractive index
 - c. Angle of incidence
 - d. Reflective index
-

41. Neha bought a book at 30% discount for Rs. 1300 and sold it at 30% profit. (+1, -0.33)
How much did she earn?

- a. Rs. 273
 - b. Rs. 390
 - c. Rs. 780
 - d. Rs. 0
-

42. Who was honoured with the Padma Bhushan award in the field of art (+1, -0.33)
music from Maharashtra in 2018?

- a. S.P. Balasubramaniam
 - b. A. R. Rahman
 - c. Arvind Parikh
 - d. Ilayaraja
-

43. Which Indian boxer was honoured with the 'Legend Award' by the (+1, -0.33)
Amateur International Boxing Association (AIBA)?

- a. Mandeep Jangda

- b. Sarjubala Devi
- c. MC Mary Kom
- d. Shiv thapa

44. A statement is followed by two arguments. Decide which of the arguments is/are strong with respect to the statement. (+1, -0.33)

Statements:

It is better to buy a double door refrigerator

Arguments:

I. Yes, it provides separate space for freezer and refrigerator.

II. No, it is too expensive and consumes more power

- a. Neither I nor II is strong
- b. Only logic I is strong
- c. Either I or II is strong
- d. Only logic II is strong

45. Which of the following Venn diagrams correctly depicts the relationship between the following classes? (+1, -0.33)

A) Biscuit B) Rice Pakoras C) Baking





46. If EGG is coded as 577, then what will be the code for TELL? (+1, -0.33)

- a. 2051313
- b. 2051212
- c. 2061212
- d. 2051213

47. Rani is two years older than Ragini, whose age is twice the age of Nag. If the sum of ages of Rani, Ragini and Nag is 27 years, then what is the age of Ragini? (+1, -0.33)

- a. 9
- b. 8
- c. 10
- d. 7

48. Which of the following former or present Chief Minister of India was a priest of the first temple? (+1, -0.33)

- a. Yogi Adityanath
- b. Vijay Rupani

c. Manohar Parrikar

d. Mayawati

49. A rectangle whose dimensions are 4 cm and 2 cm is bent to form an equilateral triangle. What will be the area of the equilateral triangle so formed? (+1, -0.33)

a. $4\sqrt{3} \text{ cm}^2$

b. $6\sqrt{3} \text{ cm}^2$

c. $\frac{9}{4}\sqrt{3} \text{ cm}^2$

d. $2\sqrt{3} \text{ cm}^2$

50. On an average, Pramod uses 10% of his monthly salary to fill petrol in his car. The remaining 80% is spent on domestic work and 10% saves salary. (+1, -0.33)

If, on a monthly basis, he spends on domestic work is Rs. 24000, then what is his annual income?

a. Rs. 360000

b. Rs. 160000

c. Rs. 80000

d. Rs. 240000

51. $\tan 34 \tan 42 \tan 48 \tan 56 + \tan 60 \cot 30 - \operatorname{cosec} 30 \sec 60 = ?$ (+1, -0.33)

a. 0

b. 1.5

c. 1

d. 2

52. The square root of 6724 is: (+1, -0.33)

a. 78

b. 76

c. 82

d. 74

53. _____ compound has -OH as a functional group. (+1, -0.33)

a. Carboxylic acid

b. Ethanoic acid

c. Acetic acid

d. Alcohol

54. Which organization has established Govardhan Ecological Village in Maharashtra? (+1, -0.33)

a. ISH Foundation

b. R.A.S.

c. Gaudiya Math

d. Iskcon

55. $392 - 39.2 - 3.92 - 0.392 = ?$

(+1, -0.33)

a. 346.468

b. 346.508

c. 348.488

d. 348.468

56. Which of the following Bollywood actress has won the Best Actress award at the International Film Festival of Australia and Awards (IFFA) in March 2017?

(+1, -0.33)

a. Priyanka Chopra

b. Aishwarya Rai

c. Vidya balan

d. Alia Bhatt

57. Madhu points to a picture and says, "This is my mother's sister's daughter." How is the lady in the picture related to Madhu?

(+1, -0.33)

a. Wife

b. Cousin sister

c. Daughter in law

d. Daughter

58. The sum of two fractions is $\frac{7}{6}$. One of the fraction is $\frac{3}{4}$. The second fraction will be: (+1, -0.33)

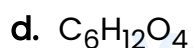
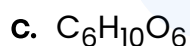
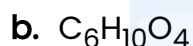
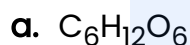
a. $\frac{4}{12}$

b. $\frac{5}{12}$

c. $\frac{4}{2}$

d. $\frac{1}{12}$

59. The compound using the proven formula CH_2O has a vapor density of 90. (+1, -0.33)
The molecular formula of the compound is:



60. Who among the following won the World Billiards Championship title in 2017? (+1, -0.33)

a. Pankaj Advani

b. Saurav Kothari

c. Michael Ferreira

d. Geet Sethi

61. If $\sec\theta + \tan\theta = 1.25$,, then $\sec\theta - \tan\theta = ?$ (+1, -0.33)

- a. 1
- b. 0.80
- c. 0.75
- d. 0.25

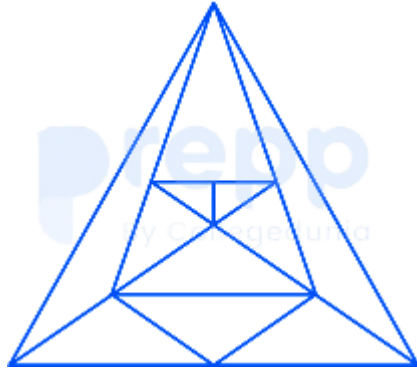
62. Which of the following does not belong to the group. (+1, -0.33)

- a. Oregano
- b. Cauliflower
- c. Salad
- d. Meat

63. The Mughal Emperor ----- adopted the title 'Alamgir'. (+1, -0.33)

- a. Aurangzeb
- b. Akbar
- c. Jahangir
- d. Shahjahan

64. How many triangles are there in this figure? (+1, -0.33)



- a. 17
- b. 23
- c. 18
- d. 19

65. An object of mass 30 kg is being moved with a uniform velocity of 10 ms^{-1} . The kinetic energy of the object is: (+1, -0.33)

- a. -150 J
- b. 1500 J
- c. - 1500 J
- d. 150 J

66. Study the statement given below and decide which of the following is implicit in the assertion. (+1, -0.33)

Statement:

The teacher told the students, "Water is a valuable resource."

Assumption:

- I. She wants children to understand the importance of water
- II. She wants them to understand that water should not be wasted.
- a. Both assumptions I and II are implicit.
- b. Only assumption II is implicit.
- c. Only assumption I is implicit.
- d. Neither assumption I nor II is implicit.

67. What is the largest 3 digit number which is exactly divisible by 10, 8 and 12? (+1, -0.33)
- a. 940
- b. 960
- c. 999
- d. 980

68. $\frac{2 \sin 30^\circ}{1 + \cos 30^\circ} + \frac{1 + \cos 30^\circ}{\sin 30^\circ} = ?$ (+1, -0.33)
- a. 4
- b. 8
- c. $4 - 2\sqrt{3}$
- d. $6 - \sqrt{3}$

69. The smaller of the two angles between the hour hand and the minute hand at 3:52 pm in a clock will be: (+1, -0.33)

- a. 165°
- b. 166°
- c. 164°
- d. 162°

70. Roots, stems and leaves of some plants develop into new plants through the process of _____. (+1, -0.33)

- a. Fragmentation
- b. Multiple fragmentation
- c. Vegetative propagation
- d. Uplift

71. Tropical rainforest can be found in the Silent Valley of _____. (+1, -0.33)

- a. Kerala
- b. Rajasthan
- c. Delhi
- d. Meghalaya

72. Complete the number series by choosing the missing number from the alternatives. (+1, -0.33)

1, 4, 9, 25, 49, (____), (____), 289, 361

- a. 121, 169
 - b. 112, 169
 - c. 131, 139
 - d. 121, 136
-

73. The Indian Railways has planned to build _____ in Jammu and Kashmir by the year 2016, which will be the world's highest railway bridge. (+1, -0.33)

- a. Wular bridge
 - b. Jhelum Bridge
 - c. Beas bridge
 - d. Chenab Bridge
-

74. A sports showroom has various sporting goods. 50% of sales in the store are swimming accessories. 40% of sales are outdoor game accessories and 10% indoor game accessories. (+1, -0.33)

If, in a particular month, the store sells Rs 10000, then what is the approximate figure for the sale of outdoor games?

- a. Rs. 8000
 - b. Rs. 5000
 - c. Rs. 3000
 - d. Rs. 4000
-

75. The image for a plane mirror is: (+1, -0.33)

- a. virtual and laterally inverted
 - b. real and laterally vertical
 - c. real and vertical
 - d. virtual and laterally vertical
-

76. A bus passes two persons cycling in the same direction as the bus with speeds of 9.6 km/hr and 12 km/hr respectively in 4.5 sec and 9 sec respectively. What is the length of the bus? (+1, -0.33)

- a. 6 m
 - b. 8 m
 - c. 7 m
 - d. 4 m
-

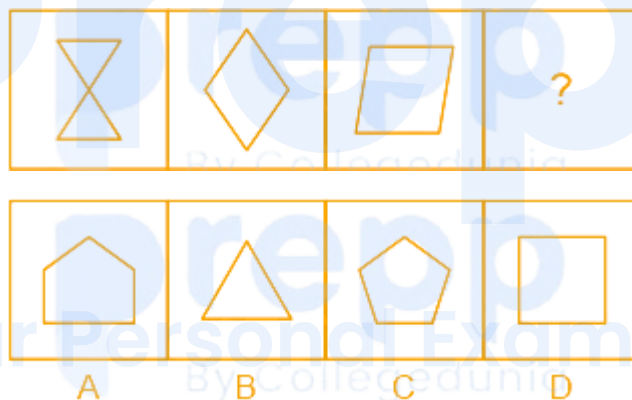
77. Vinay is the grandson of Vinod and Vishal is the grandson of Vedant. Vinod and Vedant are brothers. How is Vishal's father related to Vinay's father? (+1, -0.33)

- a. Cousin brother
 - b. Father
 - c. Maternal Uncle
 - d. Brother
-

78. The weight of Ram and Shyam is 55 kg. Ram takes 5 minutes to climb the stairs while Shyam takes 3 minutes to climb the same steps. Who does more work? (+1, -0.33)

- a. Ram and Shyam do equal work.
- b. Ram does more work than Shyam.
- c. Shyam does more work than Ram.
- d. Ram and Shyam do not do any work.

79. Select the alternative which can replace the question mark ? in the given figure. (+1, -0.33)



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

80. Who is the Chief Minister of Gujarat as of March 2017? (+1, -0.33)

- a. Shankar Singh Vaghela
 - b. Narendra Modi
 - c. Vijay Rupani
 - d. Keshubhai Patel
-

81. Find the next number in the series given below.

(+1, -0.33)

2, 16, 128, _ _ _ _

- a. 548
 - b. 1000
 - c. 524
 - d. 1024
-

82. In the code language, PAINT is written as 15081319. What is the code for COLOUR?

(+1, -0.33)

- a. 21412142017
 - b. 21411142017
 - c. 21511152017
 - d. 21311132017
-

83. Identify the odd one out:

(+1, -0.33)

12L	3C	5E	16O
A	B	C	D

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

84. Two football teams, Team A and Team B, played in the tournament and scored the following goals in 6 matches. (+1, -0.33)

Game	Goals by Team A	Goals by Team B
Game 1	2	3
Game 2	1	0
Game 3	0	1
Game 4	4	5
Game 5	3	2
Game 6	2	1

What can we conclude on the basis of average goals?

- a. Team A and Team B have the same average score.
- b. The average score of team A is higher than that of B.
- c. Team A is more compatible than Team B.

d. The average score of team B is higher than that of team A.

85. M and P leave from their house for market. They both walk 700 m towards West and then take a right turn, walk 100 m and then take a 45° anticlockwise turn to reach the market. In which direction is the market with respect to his house? (+1, -0.33)

a. In the south-east

b. In the south-west

c. In the north-west

d. In the north-east

86. An outer circular path is built around a circular garden. If the outer and inner perimeter of the path are 220 m and 44 m respectively, then find the area of the path. (+1, -0.33)

a. 3960 m^2

b. 3696 m^2

c. 3069 m^2

d. 3096 m^2

87. Which of the following sportsperson was awarded Padma Shri in 2017? (+1, -0.33)

a. Geeta Phogat

b. Babita Kumari

- c. Sakshi Malik
- d. Deepika Kumari

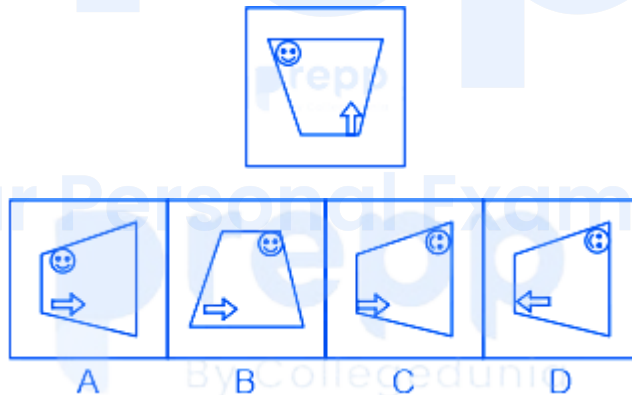
88. An athlete runs a distance of 500 m in 25 second. The average speed of an athlete is _____.

(+1, -0.33)

- a. 20 ms^{-2}
- b. 20 ms^{-1}
- c. 20 ms^1
- d. 20 ms^2

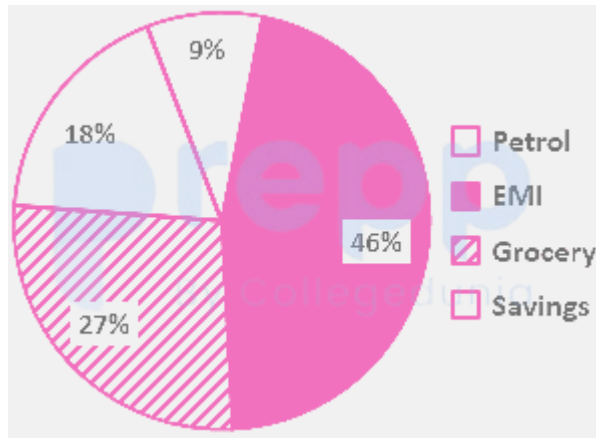
89. Which pattern resembles the following figure?

(+1, -0.33)



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

90. Following is the percentage distribution of Ramu's monthly income in four sections. If he gets Rs. 55000 per month, then what is the EMI to be paid by him in each month? (+1, -0.33)



- a. Rs. 25300
- b. Rs. 24000
- c. Rs. 26300
- d. Rs. 25000
-
91. Two pipes, working together, can fill a cistern in 3.9 hrs and 5.2 hrs respectively while a third pipe can empty a cistern in 10.4 hrs. When the tank $\frac{1}{12}$ is full, all the three pipes are opened simultaneously. How long will it take to fill the tank completely? (+1, -0.33)
- a. 2 hours 45 minute
- b. 2 hours 10 minute
- c. 2 hours 11
- d. 2 hours 36 minute

92. The product of mass and velocity is _____. (+1, -0.33)

- a. stress
- b. momentum
- c. force
- d. pressure

93. _____ tissue makes up the inner lining of our mouth. (+1, -0.33)

- a. ciliated columnar epithelium
- b. simple squamous epithelium
- c. stratified squamous epithelium
- d. columnar epithelium

94. Which of the following does not belong to this group? (+1, -0.33)

- a. Milk
- b. Can
- c. Oil
- d. Petrol

95. A statement is followed by two arguments. Decide which of the arguments is/are strong with respect to the statement. (+1, -0.33)

Statements:

Should there be opinion polls before elections?

Argument:

I. Yes, the general public gets an opportunity to understand the overall election scenario.

II. No, these polls are generally biased.

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

96. $\frac{131}{255} + \frac{2}{5} + 5 - \frac{17}{3} = ?$ (+1, -0.33)

- a. $\frac{121}{255}$
- b. $\frac{117}{255}$
- c. $\frac{63}{255}$
- d. $\frac{131}{255}$

97. Professor Amartya Sen is famous in the field of _____. (+1, -0.33)

- a. Political Science
 - b. Medical
 - c. Economics
 - d. Theatrical art
-

98. Which is the capital city of France?

(+1, -0.33)

- a. Paris
- b. Kathmandu
- c. Berlin
- d. London

99. An object travels 25 m in 3 seconds and then 15 m in 2 seconds. What is the average speed of the object?

(+1, -0.33)

- a. 6.67s^{-1}
- b. 6.67ms^{-1}
- c. 8.0ms^{-1}
- d. 8.0 m

100. If $x^2 + 1.5kx + 4.5k = 0$ lies in the recurrent root, then what will be the satisfactory value of k:

(+1, -0.33)

- a. $k = 8$ Only
- b. $k < 0$ or $k > 8$
- c. $k = 8$ or $k = 0$
- d. $0 < k < 8$

Answers

1. Answer: d

Explanation:

The correct answer is barium sulfate is formed.

- When sodium sulphate solution is mixed with barium chloride solution, then barium sulfate is formed.

★ Key Points

- When **barium chloride** combines with **sodium sulfate** in the form of their **aqueous solution** a **white precipitate** of **barium sulphate** is formed which is **insoluble in water**.
- The reaction also creates **sodium chloride (salt)** which remains **dissolved in water** and cannot be seen.
- $\text{BaCl}_2 + \text{Na}_2\text{SO}_4 \rightarrow \text{BaSO}_4 + 2\text{NaCl}$

2. Answer: a

Explanation:

Given:

$$52 \div [36 - \{24 - (32 - 54 \div 9 \times 3)\}]$$

Concept used:

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

Calculation:

$$52 \div [36 - \{24 - (32 - 54 \div 9 \times 3)\}]$$

$$\Rightarrow 52 \div [36 - \{24 - (32 - 6 \times 3)\}]$$

$$\Rightarrow 52 \div [36 - \{24 - (32 - 18)\}]$$

$$\Rightarrow 52 \div [36 - \{24 - 14\}]$$

$$\Rightarrow 52 \div [36 - 10]$$

$$\Rightarrow 52 \div 26$$

$$\Rightarrow 2$$

$\therefore$ Required answer is 2

3. Answer: b

Explanation:

The correct answer is Alkali metal group.

★ Key Points

- **Alkali Metals:**
 - Group 1 of the periodic table consists of namely, lithium (Li), sodium (Na), potassium (K), rubidium (Rb), caesium (Cs), and francium (Fr).

- **Properties of Alkali metals:**

- They have high thermal and electrical conductivity, lustre, ductility, and malleability.
- All these elements react with water to form hydrogen gas.
- Each of these, alkali metal atoms has a single electron in its outermost shell. Hence, their valency is 1.

Periodic Table of the Elements

The periodic table displays elements from Hydrogen (H) to Oganesson (Og). It is organized into groups (columns) and periods (rows). The legend indicates:

- State of matter (color of name):** Gases (blue), Liquids (green), Solids (orange), Unknown (grey).
- Subcategory in the metal-nonmetal trend (color of background):**
 - Alkali metals (light blue)
 - Alkaline earth metals (light green)
 - Transition metals (light orange)
 - Post-transition metals (light yellow)
 - Metalloids (light purple)
 - Reactive nonmetals (light pink)
 - Noble gases (light blue)
- Unknown chemical properties:** Indicated by a grey background.

Your Personal Exams Guide

4. Answer: b

Explanation:

Given:

Janki can complete in 45 days

Mansi can complete in 72 days

Concept used:

Total work = LCM of times of pipes or persons

Calculation:

LCM of 45 and 72 = 360 i.e total work

So, efficiency of Janki = $360/45 = 8$

Efficiency of Mansi = $360/72 = 5$

Effective efficiency = $8 + 5 = 13$

For last 33 days only Mansi worked

So, $33 \times 5 = 165$ units

Remaining = $360 - 165 = 195$ units

Time taken to complete 195 units = $195/13$

$\Rightarrow 15$ days

So, total time taken by them to complete the task = $33 + 15 = 48$ days

$\therefore$ It will take 48 days to complete the work

5. Answer: a

Explanation:

The correct answer is The Golden House.

- The novel The Golden House by Salman Rushdie was released in 2017.

★ Key Points

- The Golden House, a novel by Salman Rushdie was released in 2017.
- Salman Rushdie:
 - He is a British-American novelist and essayist of Indian descent.
 - He won the Booker Prize in 1981 for his novel *Midnight's Children*.
 - His book *The Satanic Verses* came into a lot of controversies.



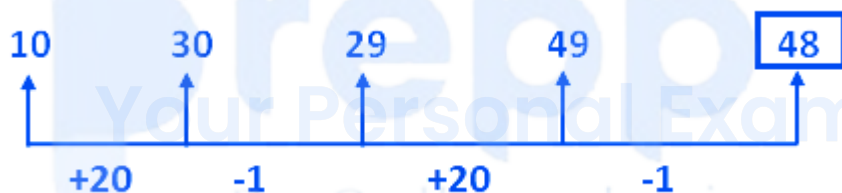
★ Additional Information

- Some of his notable writings are **The Ground Beneath Her Feet**, **Imaginary Homelands: Essays**, **Midnight's Children**, **The Moor's Last Sigh**.

6. Answer: b

Explanation:

The logic followed here is:-

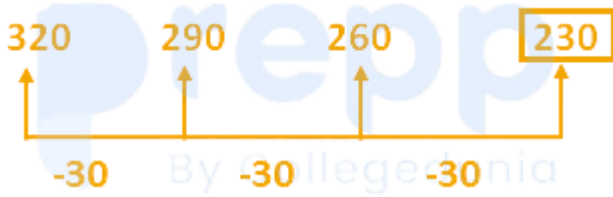


Hence, "option 2" is the correct answer.

7. Answer: b

Explanation:

The logic followed here is:-



Hence, "option 2" is the correct answer.

8. Answer: d

Explanation:

The logic followed here is:-



- inside the circle and square in figure A,



- inside pentagon and square in the figure B,



- inside the square and square in the figure C,
- but



inside only square in figure D.

Figure D is different from others.

Hence, "option 4" is the correct answer.

9. Answer: b

Explanation:

The correct answer is Vacuum.

- In a real sense, free-fall only occurs in Vacuum.

★ Key Points

- Free-fall is a state of a body where it falls in the presence of gravity.
- A fall is considered as freefall if only force acting on it is gravity.
- As the vacuum contains no matter there is no positive force against the free fall due to gravity.

★ Additional Information

- **Gravity:**
 - The **acceleration due to gravity** is the rate of increase of velocity of a body falling freely towards the earth.
- The value of **g** at the surface of the earth is 9.8 m/s^2 .
- Variation in g:
 - The value of **g** decreases with height or depth from the earth's surface.
 - g is **maximum** at poles .
 - g is **minimum** at the equator.
 - g **decreases** due to the rotation of the earth .
 - g decreases if the **angular speed of earth** increases and increases if the **angular speed of earth** decreases

10. Answer: d

Explanation:

Given:

$$(-7)[60 \div \{6 - (-4)\}] \div [(-2)\{19 - (-2) \times (-6)\}]$$

Concept used:

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

Calculation:

$$(-7)[60 \div \{6 - (-4)\}] \div [(-2)\{19 - (-2) \times (-6)\}]$$

$$\Rightarrow (-7)[60 \div \{6 + 4\}] \div [(-2)\{19 - 12\}]$$

$$\Rightarrow (-7)[60 \div 10] \div (-14)$$

$$\Rightarrow -42 \div (-14)$$

$$\Rightarrow 3$$

$\therefore$ Required answer is 3

11. Answer: a

Explanation:

The correct answer remainsthe same.

- In a circuit resistors are connected in series, the value of current through the circuit remains the same.

★ Key Points

- **Resistance :**
 - The opposition offered by a conductor to the flow of current through it is called resistance.
 - Its SI unit is the **ohm**.
- **Resistors in series :**
 - When resistors are connected in series, the **current through each resistor remains the same**.
 - The **total voltage across all the resistors is equal to the sum of the voltages across each resistor**.

★ Additional Information

- **Resistors in Parallel:**
 - When resistors are connected in parallel,
 - The **voltage across remains the same**.

- The supply current is equal to the sum of the currents through each resistor.

12. Answer: d

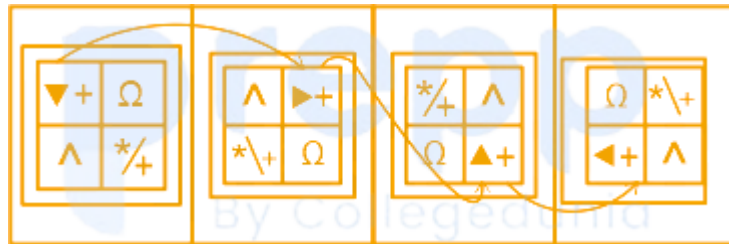
Explanation:

The logic followed here is:-

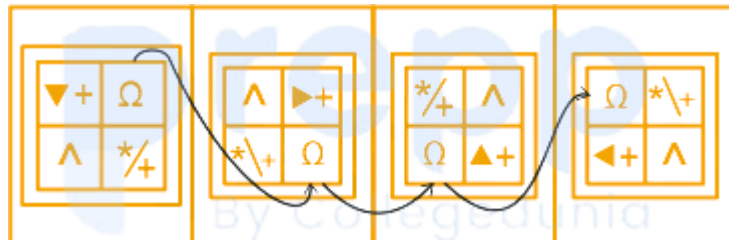
- Triangle (



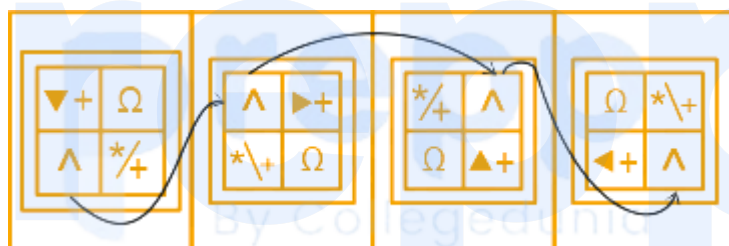
) rotates 90° anticlockwise directions in each step.



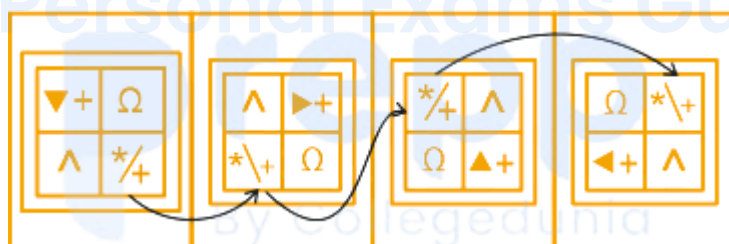
- Symbol (Ω) rotates one place in the clockwise direction in each step.



- Symbol ($\wedge$) rotates one place in the clockwise direction in each step.



- The symbol $*/+$ rotates one place in the clockwise direction in each step. Also, $*/$ symbol changes to $\backslash$ in alternate figures.



- So, the next image of the given series is:-



Hence, "option 4" is the correct answer.

13. Answer: d

Explanation:

The correct answer is Saanjh.

- Saanjh film made in the dialect of Himachal has gained international recognition for the first time, winning the Best Feature Film award at the International Borrego Springs Film Festival in California, USA in the year 2017.

★ Key Points

- Saanjh:
 - Saanjh is the first movie in the Himachali language released all over India.
 - The film is produced and directed by Ajay Sakhlani.
 - The film shows the story of people who migrated from their ancestral village.
 - The film the Best Feature Film award at the International Borrego Springs Film Festival in California, the USA in the year 2017.

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14. Answer: d

Explanation:

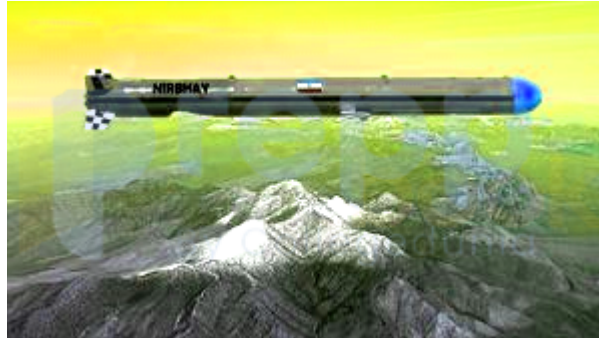
The correct answer is Nirbhay.

- Nirbhay is India's indigenously designed and developed long-range subsonic cruise missile.

★ Key Points

- Nirbhay Missile:

- It is a **long-range, all-weather, subsonic cruise missile** that is designed and developed indigenously by the **Aeronautical Development Establishment (ADE)**.
- It can be launched from **multiple platforms** and is capable of carrying **conventional and nuclear warheads**.



★ Additional Information

- Helena and NAG are anti-tank guided missiles.
- Pinaka is a multiple rocket launcher system.

15. Answer: c

Explanation:

The correct answer is K. Vishwanath.

- K. Vishwanath was honoured with the Dadasaheb Phalke Award for the year 2016.

★ Key Points

- K. Vishwanath is a Telugu film director, screenwriter and actor.
- He was given the **Padma Shri award** in the year **1992**.
- He was given the **Dadasaheb Phalke Award** in the year **2016**.



- **Dada Saheb Phalke Award:**
 - Dadasaheb Phalke Award is **India's highest award in cinema**.
 - It is presented annually at the National Film Awards ceremony by the **Directorate of Film Festivals** (an organisation set up by the Ministry of Information and Broadcasting).
 - The award prize consists of a golden lotus, a cash prize of **₹10 lakh** and a shawl.

- The award is given to people for their outstanding contribution to the growth and development of Indian cinema.
- It was first presented in **1969**.
- The first recipient of the award was actress **Devika Rani**, “the first lady of Indian cinema.”

16. Answer: b

Explanation:

The question asks for ways to avoid noise pollution in urban areas.

- Argument I suggests a fair idea, by segregating noisy zones from residential i.e. calm zones, noise pollution can be avoided. So, argument I is strong.
- Since there are ways to avoid noise pollution in urban areas, argument II is not correct.

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

17. Answer: a

Explanation:

Given:

Mean of 1st group = 10

Mean of 2nd group = 12

Concept used:

Average = Sum of elements/No. of elements

Calculation:

Total score of group 1 = $10 \times 12 = 120$

Total score of group 2 = $12 \times n = 12n$

According to the question,

$$120 + 12n = 11.2(12 + n)$$

$$\Rightarrow 120 + 12n = 134.4 + 11.2n$$

$$\Rightarrow 0.8n = 14.4$$

$$\Rightarrow n = 18$$

$\therefore$ The value of n is 18

18. Answer: b

Explanation:

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

The family tree is given below:-



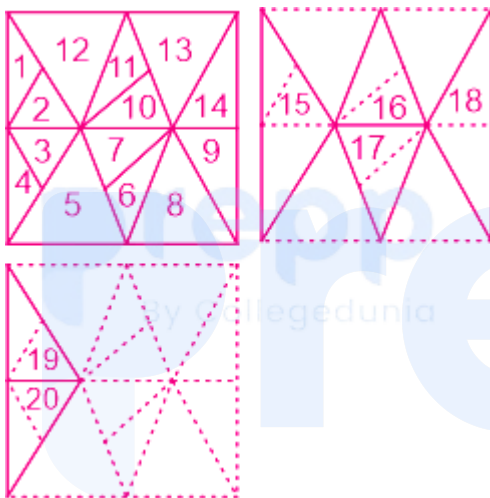
Sharda is the daughter of Kiran.

Hence, "option 2" is the correct answer.

19. Answer: d

Explanation:

The triangles are as follows:-



The total number of triangles is 20.

Hence, "option 4" is the correct answer.

20. Answer: b

Explanation:

The correct answer is Iodine.

- Iodine is essential for the synthesis of thyroxine.

★ Key Points

- Iodine is a necessary and limiting substrate for the thyroid gland.
- It helps in the synthesis of thyroxine.
- The deficiency of Iodine can cause hypothyroidism, developmental brain disorders and goiter.

21. Answer: b

Explanation:

The correct answer is the Federation of Indian Chamber of Commerce and Industry.

- The full form of FICCI is the Federation of Indian Chamber of Commerce and Industry.

★ Key Points

- Federation of Indian Chamber of Commerce and Industry (FICCI):
 - It is a non-governmental trade association.
 - It was established in the year 1927.
 - It was founded by Ghanshyam Das Birla and Purshottamdas Thakurdas.
 - Its members are from the corporate sector, both private and public, including SMEs and MNCs.
 - Its headquarters is in New Delhi.

22. Answer: a

Explanation:

The correct answer is Parents are pure breeding.

- Mendel's laws apply only when p arents are pure breeding.

★ Key Points

- **Gregor Mendel**, through his experiments on pea plants, discovered the fundamental laws of inheritance.
- He deduced **three laws** from his experiments and these laws are applicable when **parents are pure breeding**.
- The **three laws of inheritance** proposed by **Mendel** include :
 - **Law of Dominance**
 - **Law of Segregation**
 - **Law of Independent Assortment**

23. Answer: a

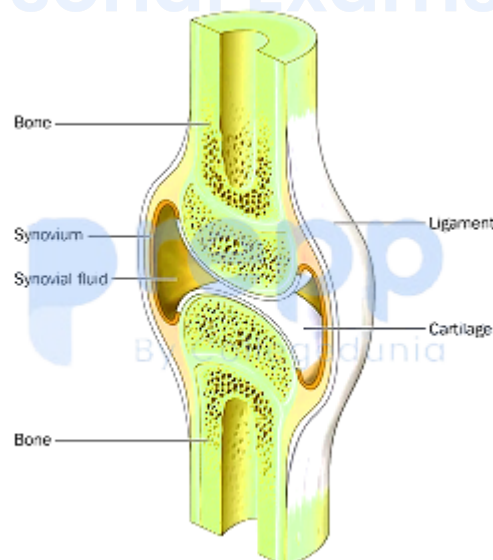
Explanation:

The correct answer is cartnon-vascularilage.

- **Cartilage softens the bone surface at the joint.**

★ Key Points

- **Cartilage** is the tissue that softens the bone surface at joints.
- It is a **flexible connective tissue** that differs from the bone.
- It is a **type** of supporting connective tissue and is found throughout the body.



★ Additional Information

- The **areolar tissue** is found under the dermis layer.
 - A **tendon** is a **fibrous connective tissue** that attaches muscle to bone.
-

24. Answer: d

Explanation:

The correct answer is plaster of Paris.

- Calcium sulphate hemihydrate is also known as plaster of Paris.

★ Key Points

- **Plaster of Paris**
 - It is chemically **calcium sulphate hemihydrate**, i.e. $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$.
 - It is formed from gypsum, that is, $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$.
 - It is used to plaster fractured bones, for making toys, materials for decoration, and for making surfaces smooth.

★ Additional Information

- **Washing Soda**
 - Its chemical name is **sodium carbonate decahydrate** ($\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$).
 - It is used in glass, soap, and paper industries and for removing the permanent hardness of the water.
 - **Baking Soda**
 - It is **sodium hydrogen carbonate** (NaHCO_3).
-

25. Answer: a

Explanation:

Given:

$$(12 - 1) \text{ of } (16 + 15) \times (119 + 113 - 16)$$

Concept used:

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

Calculation:

$$(12 - 1) \text{ of } (16 + 15) \times (119 + 113 - 16)$$

$$\Rightarrow (12 - 1) \text{ of } (16 + 15) \times (232 - 16)$$

$$\Rightarrow 11 \text{ of } 31 \times 216$$

$$\Rightarrow 11 \times 31 \times 216$$

$$\Rightarrow 73656$$

∴ Required answer is 73656

26. Answer: d

Explanation:

The horizontal mirror image is given below:-



Hence, "option 4" is the correct answer.

27. Answer: a

Explanation:

Given:

Builder build a wall in 5 hours

Destroyer destroy the wall in 7 hours

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:

Wall built in 1 hour = $1/5$ of the total work

Wall destroyed by the destroyer in 1 hour = $1/7$

Total work done by builder and destroyer in 1 hour = $(1/5 - 1/7) = 2/35$

Work done by both builder and destroyer in 3.5 hours = $(2/35) \times 7/2 = 1/5$

Remaining work = $1 - (1/5) = 4/5$

Time taken by the builder for the remaining wall = $(4/5)/(1/5) = (3/5) \times 5$

$\Rightarrow$ 4 hours

Total time to build the wall = $(3.5 + 4) = 7.5$ hours

$\therefore$ The total time (in hours) required to build the wall is 7.5 hours

28. Answer: b

Explanation:

The question is whether doctors should suggest walking as an alternative medicine for diabetics.

- Argument I agrees to it and justifies by stating that there is proof that walking is good for health. Thus, argument I is strong.
- Argument II suggests an excuse that due to busy schedules people may not be able to go walking in the morning but the doctors are not specifically suggesting morning walks. It could be walking at any time of the day. So, argument II is not strong.

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

29. Answer: d

Explanation:

Given: Your Personal Exams Guide

Ratio of consumption = 9 : 5

Calculation:

According to the question,

$$9 = 18$$

$$\text{So, } 5 = 18/9 \times 5$$

$\therefore$ His lesser consumption is 10 liters

30. Answer: b

Explanation:

Given:

Distance travelled by the object in 4 sec = 24 m

Distance travelled by the object in 2 sec = 15 m

Formula used:

Distance = Speed $\times$ time

Average speed = Total distance/Total time

Calculation:

Total distance travelled by the object = $24 + 15 = 39$ m

Total time taken = $4 + 2 = 6$ sec

Average speed = $39/6$

$\Rightarrow 6.5$ m/s

$\therefore$ The average speed of the object is 6.5 m/s.

31. Answer: a

Explanation:

The correct answer is Farid.

- Farid was the real name of Sher Shah Suri or Sher Khan.

★ Key Points

- Sher Shah Suri:
 - His real name was *Farid*.
 - He joined the **Babar Khan Lohani's service** and then was appointed as the **Deputy Governor of Bihar**.
 - He usurped the throne as '*Hazarat-i-Ald*'.
 - He gained Chunar by marrying one widow Lad Malika.
 - **Battle of Chausa** : In 1539 AD, he captured **Chausa** from Humayun.
 - He assumed the title of **Sher Shah as the emperor**.
 - He also issued coins and *Khutba* was read in his name.
 - The whole area from Bengal to Benares was under his empire.
 - The **campaign of Bundelkhand** was the last campaign of his life.
 - He built **Purana Qila, Grand Trunk Road**.
 - He also built his **tomb** at **Sasaram in Bihar**.



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32. Answer: d

Explanation:

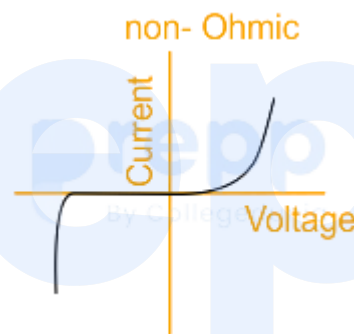
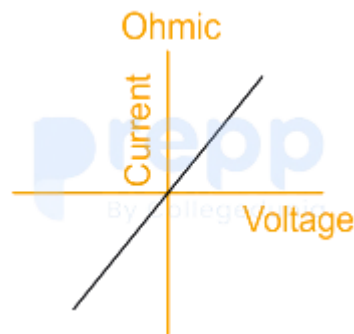
The correct answer is the Linear curve.

- The current-voltage graph of ohmic devices is of the form linear curve.

★ Key Points

- Ohm's Law
 - The **electric current** flowing through a conductor is directly proportional to the potential difference across its ends.

- It is given by the formula:
- $V=IR$
- The **device which follows ohm's law** for all voltages across it is called an **ohmic device**.
- The current-voltage graph of ohmic devices is a **linear curve**.



33. Answer: d

Explanation:

Given:

Manoj used to spend his income on food = 25%

He got an increment of = Rs. 1000

After increment in salary, his expenditure on food dropped = 20%

Concept used:

If any value decreases by x%, then,

Remaining value = $(100 - x)/100 \times \text{Actual value}$

If any value increases by $x\%$, then,

Increased value = $(100 + x)/100 \times \text{Actual value}$

Calculation:

Let salary of Manoj be Rs. x

$\Rightarrow$ Expenditure on food was = $x \times 25/100 = \text{Rs. } x/4$

New salary of Manoj = $(x + 1000)$

According to the question

$$(x + 1000) \times (20/100) = x/4$$

$$\Rightarrow x/5 + 200 = x/4$$

$$\Rightarrow x/4 - x/5 = 200$$

$$\Rightarrow x/20 = 200$$

$$\Rightarrow x = 4000$$

$\therefore$ Salary of Manoj was Rs. 4000.

★ **Shortcut Trick**

Spends 25% on food,

$$\Rightarrow 25\% = 25/100 = 1/4$$

Let total salary be Rs. 4, then he spends Rs. 1 on Food

$$\text{Saving} = 4 - 1 = \text{Rs. } 3$$

Now his salary increased by Rs. 1,000,

According to the question,

Spending on food is same i.e. 1 and it is 20%

$$\Rightarrow 20\% = 20/100 = 1/5$$

New salary = 5,

Increased in salary = $5 - 4 = 1$ which is equal to 1000

Initial income = $4 = 4 \times 1000 = \text{Rs. } 4,000$

34. Answer: a

Explanation:

Given:

Total amount = Rs. 88

Ratio between Jayati & Prateek = 5 : 6

Concept Used:

Normal Ratio Division

Calculation:

Amount received by Jayati = $88 \times \frac{5}{11} = \text{Rs. } 40$

$\therefore$ Jayati gets Rs. 40

35. Answer: b

Explanation:

The correct answer is the Modern periodic table.

- There are 7 periods and 18 groups in the Modern periodic table classification.

★ Key Points

- **Periodic Table:**
 - It is a tabular presentation of the chemical elements, organised on the basis of their properties.
- **Mendeleev's Periodic Table (1869):**
 - It is based upon Mendeleev's periodic law, which states, "Properties of the elements are the periodic function of their atomic masses."
 - **Mendeleev** is known as the **father of the periodic table**.
- **Modern Periodic Law** was given by **Moseley**.
 - According to him: "The physical and chemical properties of the elements are the periodic function of their atomic numbers."
- **Modern Periodic Table:**
 - It is a graphical representation of the **Aufbau principle**.
 - It is based on the electronic configuration of elements and contains **118 elements**.
 - There are **7 periods and 18 groups**.
 - Modern periodic table is classified as:
 - i. s-block;
 - ii. p-block;
 - iii. d-block;
 - iv. f-block.

Your Personal Exams Guide

Table: Modern Periodic table

[illegible]

36. Answer: a

Explanation:

The correct answer is Uranium.

- The mines of Jadugoda are famous for uranium.

★ Key Points

- **Jaduguda mine** is the **first mine in the country** to produce **uranium on a commercial scale**.
- It is in **Singhbhum thrust belt** is the first uranium deposit to be discovered in the country in **1951**.
- It is located in the **Singhbhum district of Jharkhand**.
- The mining operations here began in the year **1967-68**.
 - **Other Uranium mines in India:**

Mines	State
Tummalapalle uranium mine	Andhra Pradesh
Bagjata	Jharkhand
Bhatin	Jharkhand
Turamdih uranium mine	Jharkhand

★ Additional Information

- Khetri copper belt in Rajasthan is famous for the production of copper .
- Hatti Gold Mines and Kolar Gold Fields of Karnataka are famous for the production of gold .
- Bailadila Mines of Chhattisgarh is famous for the production of Iron in India.

37. Answer: b

Explanation:

The correct answer is Li.

- Li is the lightest metal.

★ Key Points

- Lithium :
 - It is the lightest metal .
 - Its atomic number is 3.
 - Its atomic mass is 6.941 g.mol^{-1} .
 - It was discovered by Johann Artvedson in the year 1817.

★ Additional Information

- The atomic number of calcium is 20.
- The atomic number of phosphorus is 15.
- The atomic number of helium is 2.

38. Answer: c

Explanation:

The correct answer is SiO₂.

- SiO₂ is the main component of cement.

★ Key Points

- Cement :
 - It is a complex material containing a controlled chemical combination of calcium, silica, aluminium, iron and other ingredients.
 - Silicon dioxide (SiO₂) is the main component of cement.
- Types of Cement:
 - Ordinary Portland Cement (OPC).
 - Portland Pozzolana Cement (PPC).
 - Rapid Hardening Cement.
 - Extra Rapid Hardening Cement.
 - Low Heat Cement.
 - Sulfates Resisting Cement.

Your Personal Exams Guide

39. Answer: c

Explanation:

The correct answer is 18.

- An element with electronic frequency 2, 8, 8 is placed in group 18 in the modern periodic table.

★ Key Points

- Periodic Table:

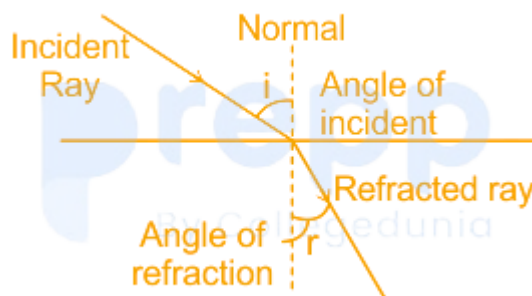
- It is a tabular presentation of the chemical elements, organized on the basis of their properties.
- **Mendeleev's Periodic Table (1869):**
 - It is based upon Mendeleev's periodic law, which states, "Properties of the elements are the periodic function of their atomic masses."
 - **Mendeleev** is known as the **father of the periodic table**.
- **Modern Periodic Law**
 - The physical and chemical properties of the elements are the periodic function of their atomic numbers.
- **Modern Periodic Table:**
 - It is a graphical representation of the **Aufbau principle**.
 - It is based on the electronic configuration of elements and contains **118 elements**.
 - There are **7 periods and 18 groups**.
 - Modern periodic table is classified as:
 - i. s-block;
 - ii. p-block;
 - iii. d-block;
 - iv. f-block

40. Answer: b

Explanation:

CONCEPT:

- Refraction of Light: The bending of the ray of light passing from one medium to the other medium is called refraction .



- The refraction of light takes place on going from one medium to another because the speed of light is different in the two media .
- The greater the difference in the speeds of light in the two media, the greater will be the amount of refraction .
- A medium in which the speed of light is more is known as an optically rarer medium and a medium in which the speed of light is less is known as an optically denser medium .

EXPLANATION :

The difference in speed of light is due to Refractive index.

- Mathematically the refractive index can be written as

$$\Rightarrow \text{Speed of light in a medium (v)} = \frac{\text{Speed of light in vacuum (C)}}{\text{Refractive index } (\mu)}$$

- As the speed of light in a vacuum is constant , therefore we can say that speed of light in a medium is inversely proportional to the refractive index of the medium.
- Hence, we can say that the speed of light travels at different speeds in different media .
- The speed of light in the air is $3 \times 10^8 \text{ m/s}$.
- When the light is travelling from water to air and as we know that the refractive index of water (1.33) and that of air (1.008) , it means the water is a denser medium and air is a rarer medium.
- Whenever light goes from water to air , the frequency of light and phase of light does not change .
- However, the velocity of light and wavelength of light change (increases) because the light is travelling from a denser medium ($\mu_{\text{water}} = 1.33$) to a

rarer medium ($\mu_{\text{air}} = 1.008$).

★ Additional Information

- We can predict that Light travels slower in water than in air because as light travels from a rarer medium to a denser medium its velocity decreases because of the change in density of the medium
- This is a reason why light bends towards normal when it passes from a rarer medium to a denser medium
- And the amount of bending of light in any medium is given using the refractive index of a material.

41. Answer: b

Explanation:

Given:

Profit percentage = 30%

Concept used:

Profit = CP $\times$ Profit%

Calculation:

30% = $\frac{3}{10}$

So,

Profit = 1300 $\times$ $\frac{3}{10}$

$\Rightarrow$ Rs. 390

$\therefore$ She earned Rs. 390

42. Answer: c

Explanation:

The correct answer is Arvind Parikh.

- Arvind Parikh was honoured with the Padma Bhushan award in the field of art music from Maharashtra in 2018.

★ Key Points

- **Arvind Parikh:**
 - He is a **classical sitar player**.
 - He was also the **vice president of the International Music Council (UNESCO)** during 1994–97.
 - He was given the Padma Bhushan award in the year 2018.



★ Important Points

- **Padma Bhushan:**
 - The award is given for distinguished service of a high order in any field, including service rendered by government servants.
 - It is the **third-highest civilian** honour in India.
- It was **first awarded in 1954**.

★ Additional Information

- S.P. Balasubramaniam was given Padma Vibhushan (2021, posthumously), Padma Bhushan in 2011, and Padma Shri in 2001.
- A. R. Rahman was given the Padma Bhushan in the year 2010.
- Ilayaraja was awarded the Padma Bhushan award in the year 2010 and Padma Vibhushan in 2018.

43. Answer: c

Explanation:

The correct answer is MC Mary Kom.

- MC Mary Kom was honoured with the 'Legend Award' by the Amateur International Boxing Association (AIBA).

★ Key Points

- **MC Mary Kom:**
 - Her full name is **Mangte Chungneijang Mary Kom**.
 - She is the only woman in the world to win the World Amateur Boxing Championship **six times**.
 - She is nicknamed ***Magnificent Mary***.
 - Mary Kom has won **eight World Championship medals**.
 - No other boxer **either male or female** in this world holds such an accomplishment.
 - She has won **six gold, one silver, and one bronze** in the opposition in her **famous lifetime**.
 - The last one came in **Russia in 2019**.
 - She is also a Member of Parliament, Rajya Sabha.

★ Additional Information

- **Amateur International Boxing Association (AIBA):**
 - It is also known as the **International Boxing Association**.
 - It was formed in the year **1946**.
 - Its headquarters is located in **Lausanne, Switzerland**.

44. Answer: c

Explanation:

The given statement suggests whether buying double-door refrigerator is better.

- Argument I agrees with it giving the reason that it is good since it separates freezer and refrigerator. So it is strong.
- Argument II disagrees with it giving the reason that it is costlier and needs more power. So this is also strong.
- Since the arguments are justifying opposite answers, either one of them can be strong at a time. One argument states the benefit whereas the other argument states the disadvantage of a double-door refrigerator.

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

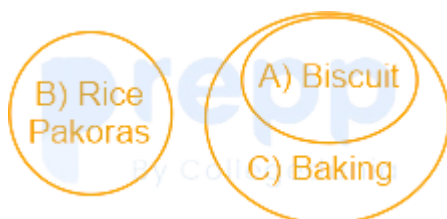
45. Answer: a

Explanation:

The logic followed here is:-

- All biscuits are baked and
- rice pakoras are different from both.

The logical Venn diagram is given below:-



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

46. Answer: b

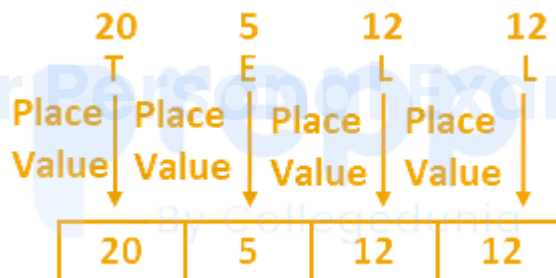
Explanation:

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

The logic followed here is:-



Similarly,



Hence, "option 2" is the correct answer.

47. Answer: c

Explanation:

Given:

Total age of Rani, Ragini, and Nag is 27 years

Calculation:

Let Rani age be 'x' years, Ragini age be 'y' years and Nag age be 'z' years,

Rani is two years older than Ragini,

$$\Rightarrow x = y + 2$$

$$y = 2z$$

The total ages of Satheesh, Goutam, and Sai is 27,

$$\Rightarrow y + y + 2 + y/2 = 27$$

$$\Rightarrow (2y + 2y + y)/2 = 25$$

$$\Rightarrow 5y = 50$$

$$\Rightarrow y = 10$$

$$\Rightarrow \text{Ragini} = 10$$

$\therefore$ Ragini's age is 10 years.

48. Answer: a

Explanation:

The correct answer is Yogi Adityanath.

- Yogi Adityanath was a priest of the first temple.

★ Key Points

- **Yogi Adityanath:**
 - He is the 22nd and current Chief Minister of Uttar Pradesh.

- He is from the **Gorakhpur constituency**.
- He is also the head priest of the **Gorakhnath Math, Gorakhpur**.
- He is also the founder of **Hindu Yuva Vahini**.

★ Additional Information

- **Vijay Rupani** was the **former chief minister of Gujarat**.
- **Manohar Parrikar** was a **former defence minister of India**.
 - He was an **IIT alumnus**.
- **Mayawati** was **Chief Minister of Uttar Pradesh** briefly in 1995 and again in 1997, then from 2002 to 2003 and from 2007 to 2012.

49. Answer: a

Explanation:

Given:

Dimensions of the rectangle are 4 cm and 2 cm

Formula used:

Perimeter of rectangle = $2(l + b)$

Perimeter of equilateral triangle = $3a$

Area of equilateral triangle = $\frac{\sqrt{3}}{4} \times a^2$

Calculation:

According to the question,

$$2(l + b) = 3a$$

$$\text{So, } 2(6) = 3a$$

$$\Rightarrow a = 4$$

Now,

$$\sqrt{3}/4 \times 4^2$$

$$\Rightarrow 4\sqrt{3} \text{ cm}^2$$

$\therefore$ The area of the equilateral triangle so formed will be $4\sqrt{3} \text{ cm}^2$

50. Answer: a

Explanation:

Given:

His monthly spend = Rs. 24000

Calculation:

According to the question,

$$80\% = 24000$$

$$\Rightarrow 100\% = 24000/80 \times 100$$

$$\Rightarrow \text{Rs. } 30000$$

$$\text{Annual income} = 30000 \times 12$$

$$\Rightarrow \text{Rs. } 360000$$

$\therefore$ His annual income is Rs. 360000

51. Answer: a

Explanation:

Given:

$$\tan 34 \tan 42 \tan 48 \tan 56 + \tan 60 \cot 30 - \operatorname{cosec} 30 \sec 60$$

Concept used:

	0°	30°	45°	60°	90°
sin	0	1/2	1/√2	√3/2	1
cos	1	√3/2	1/√2	1/2	0
tan	0	1/√3	1	√3	∞
cosec	∞	2	√2	2/√3	1
sec	1	2/√3	√2	2	∞
cot	∞	√3	1	1/√3	0

θ	Sin θ	Cos θ	Tan θ	Cot θ	Sec θ	Cosec θ
90° - α	Cos α	Sin α	Cot α	Tan α	Cosec α	Sec α
90° + α	Cos α	- Sin α	-Cot α	-Tan α	-Cosec α	Sec α
180° - α	Sin α	-Cos α	-Tan α	-Cot α	-Sec α	Cosec α
180° + α	- Sin α	-Cos α	Tan α	Cot α	-Sec α	-Cosec α
270° - α	-Cos α	-Sin α	Cot α	Tan α	-Cosec α	-Sec α
270° + α	-Cos α	Sin α	-Cot α	-Tan α	Cosec α	-Sec α
360° - α	- Sin α	Cos α	-Tan α	-Cot α	Sec α	-Cosec α
- α	- Sin α	Cot α	-Tan α	-Cot α	Sec α	-Cosec α

Calculation:

$$\tan 34 \tan 42 \tan 48 \tan 56 + \tan 60 \cot 30 - \operatorname{cosec} 30 \sec 60$$

$$\Rightarrow \tan 56 \tan 34 \tan 48 \tan 42 + \tan 60 \cot 30 - \operatorname{cosec} 30 \sec 60$$

$$\Rightarrow \tan 56 \tan (90 - 56) \tan 48 \tan (90 - 48) + \tan 60 \cot 30 - \operatorname{cosec} 30 \sec 60$$

$$\Rightarrow \tan 56 \cot 56 \tan 48 \cot 48 + \tan 60 \cot 30 - \operatorname{cosec} 30 \sec 60$$

$$\Rightarrow 1 + \sqrt{3} \cdot \sqrt{3}$$

$$\Rightarrow 1 + \sqrt{9}$$

$$\Rightarrow 1 + 3 = 4$$

$$\operatorname{cosec} 30 \sec 60$$

$$2 \times 2 = 4$$

$$4 - 4 = 0$$

$\therefore$ Required answer is 0

52. Answer: c

Explanation:

Given:

6724

Concept used:

Prime factorization method to find square root

Calculation:

$$6724 = 2 \times 2 \times 41 \times 41$$

$$\Rightarrow 6724 = 82^2$$

$\therefore$ The square root of 6724 is 82

53. Answer: d

Explanation:

The correct answer is Alcohol.

- Alcohol compound has -OH as a functional group.

★ Key Points

- **Alcohols** are important molecules in organic chemistry.
 - They can be prepared from and converted into many different types of compounds.
 - Alcohols contain the hydroxy functional group ($-OH$) which is bonded to a carbon atom of an alkyl or a substituted alkyl group.
 - The functional group of an alcohol is the hydroxyl group, $-OH$.

★ Additional Information

- The functional group of the carboxylic acid is $-COOH$.

54. Answer: d

Explanation:

The correct answer is Iskcon.

- Iskcon has established Govardhan Ecological Village in Maharashtra.

★ Key Points

- **Govardhan Village:**
 - The village is located in **Wada taluka, Palghar district** at the foothills of the Sahyadri mountains.
 - It was set up by the International Society for Krishna Consciousness (ISKCON) in the adjoining Thane district.
 - The village has also won an award for being a sustainable project in rural Maharashtra.
- **ISKCON:**
 - It is the acronym for **International Society for Krishna Consciousness**.
 - It is also known as the **Hare Krishna movement**.
 - It was founded in the year **1966** in **New York City** by **A. C. Bhaktivedanta Swami Prabhupada**.
 - Its headquarters is located at Mayapur Chandrodaya Mandir

Nadia, West Bengal.

★ Additional Information

- ISH is International Social Humanity Foundation.
 - It was founded by Sadhguru.
- Gaudiya Math is founded by Bhaktisiddhanta Sarasvati.

55. Answer: c

Explanation:

Given:

$$392 - 39.2 - 3.92 - 0.392$$

Calculation:

$$392 - 39.2 - 3.92 - 0.392$$

$$\Rightarrow 352.8 - 3.92 - 0.392$$

$$\Rightarrow 348.88 - 0.392$$

$$\Rightarrow 348.488$$

∴ Required answer is 348.488

56. Answer: b

Explanation:

The correct answer is Aishwarya Rai.

- Aishwarya Rai has won the Best Actress award at the International Film Festival of Australia and Awards (IFFA) in March 2017.

★ Key Points

- The **International Film Festival of Australia and Award** was given to **Aishwarya Rai Bacchan** for the character of **Sarabjit Singh's sister Dalbir Kaur** in the movie **Sarabjit**.
- The movie was directed by **director Omung Kumar**.

★ Additional Information

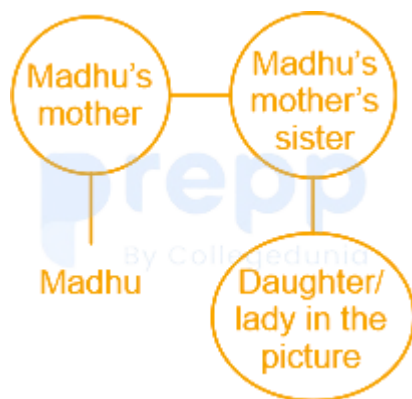
- **International Film Festival Australia:**
 - It is an annual film festival held in **Melbourne, Australia**.
 - It was founded in **1952**.

57. Answer: b

Explanation:

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

The family tree is given below:-



The lady in the picture is the cousin sister of Madhu.

Hence, "option 2" is the correct answer.

58. Answer: b

Explanation:

Given:

Sum of two numbers = $\frac{7}{6}$

Calculation:

Second fraction = $\frac{7}{6} - \frac{3}{4}$

$\Rightarrow (14 - 9)/12$

$\Rightarrow 5/12$

$\therefore$ The second fraction is $5/12$

59. Answer: a

Explanation:

The correct answer is C 6 H 12O₆.

- The compound using the proven formula CH_2O has a vapour density of 90.
 - The molecular formula of the compound is $\text{C}_6\text{H}_{12}\text{O}_6$.

★ Key Points

- $n = \frac{\text{Molecular Formula}}{\text{Empirical Formula}}$
- Given, the empirical formula of compound = CH_2O .
 - Vapour density of compound = 90.
 - Molar mass of a compound = vapour density $\times 2$
 - = 180 g.
 - Empirical formula Mass of CH_2O = $12 + 2 + 16 = 30$
 - $n = \frac{180}{30}$
 - $n = 6$
- Hence, n of the compound is 6.

60. Answer: a

Explanation:

The correct answer is Pankaj Advani.

- Pankaj Advani won the World Billiards Championship title in 2017.

★ Key Points

- Pankaj Advani:
 - He is an Indian billiards and snooker player.
 - He is a **23-time world champion**.
 - He has also won the **IBSF World Billiards Championship** 15 times.
 - He won the World Billiards Championship title in 2017.
 - The championship was held in **Doha, Qatar**.
 - He defeated **Mike Russel of England**.
 - He was awarded **Padma Shri** in 2009 and **Padma Bhushan** in 2018.

★ Additional Information

- Saurav Kothari, Michael Ferreira and Geet Sethi are all associated with the billiards.
-

61. Answer: b

Explanation:

Given:

$$\sec\theta + \tan\theta = 1.25$$

Formula used:

$$\sec^2\theta - \tan^2\theta = 1$$

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

Calculation:

$$(\sec\theta + \tan\theta)(\sec\theta - \tan\theta) = 1$$

$$\Rightarrow 1.25 \times (\sec\theta - \tan\theta) = 1$$

$$\Rightarrow (\sec\theta - \tan\theta) = 1/1.25$$

$$\Rightarrow (\sec\theta - \tan\theta) = 100/125$$

$$\Rightarrow (\sec\theta - \tan\theta) = 0.80$$

∴ Required answer is 0.80

62. Answer: d

Explanation:

The logic followed here is:-

Oregano, cauliflower, and salad are obtained from plants and meat is obtained from animals.

So, meat is different from others.

Hence, "option 4" is the correct answer.

63. Answer: a

Explanation:

The correct answer is Aurangzeb.

- The Mughal Emperor Aurangzeb adopted the title 'Alamgir'.

★ Key Points

- **Aurangzeb (1658 AD–1707 AD) :**
 - He was crowned at Delhi under the title *Alamgir*.
 - Aurangzeb captured Guru Teg Bahadur, the 9th Guru of Sikhs in 1675 AD and executed him when he refused to embrace Islam.
 - Aurangzeb compiled *Fatwa-i-Alamgiri*.
 - He was called Zinda Pir, the living saint.
 - He annexed **Marwar** in **1678 AD**.
 - The campaign was led by **Akbar II** against Durgadas, General of Ajit Singh.

★ Additional Information

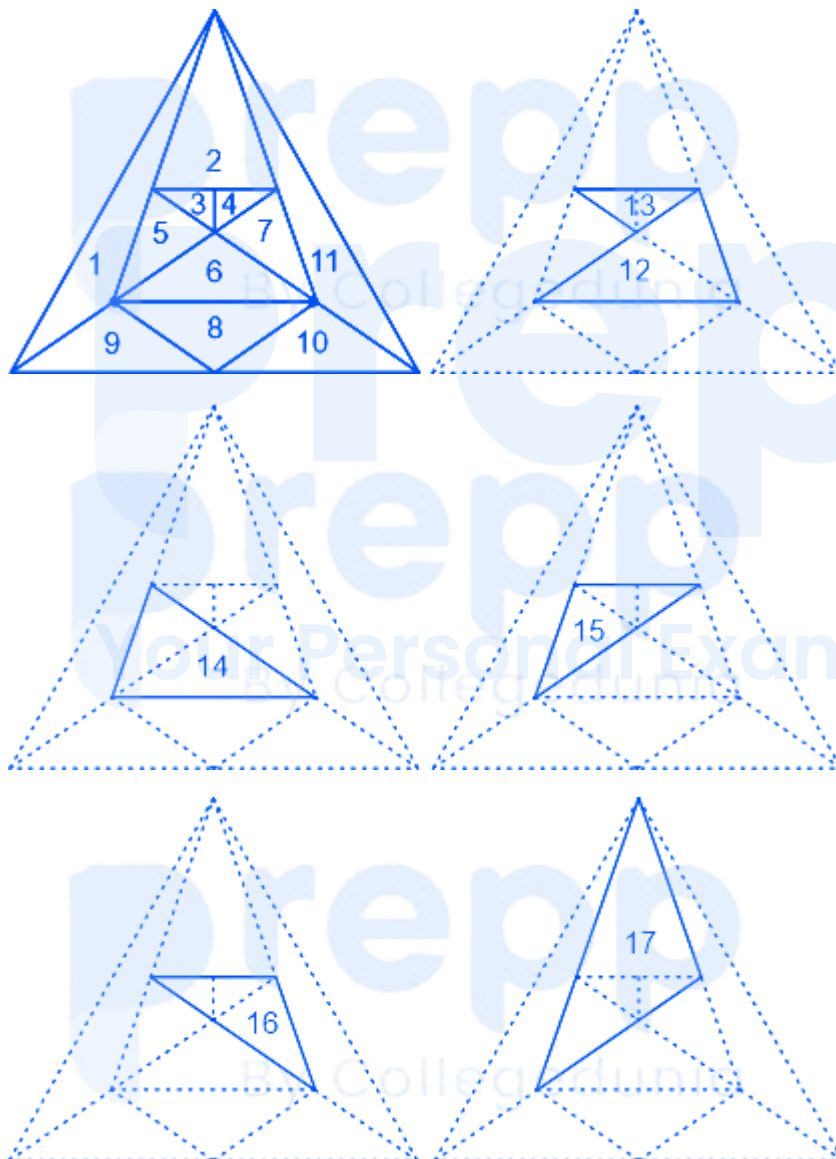
- **Akbar** ascended the throne under the title of **Jalaluddin Muhammad Akbar Badshah Ghazi**.
- **Shahjahan (1628 AD–1658 AD):**
 - His real name was *Khurram*.
 - **French** travellers *Bernier* and *Tavernier* and the **Italian** traveller *Nicolo Manucci* visited during his reign.
 - The **Red Fort, Jama Masjid, and Taj Mahal** are some of the magnificent structures built during his reign.

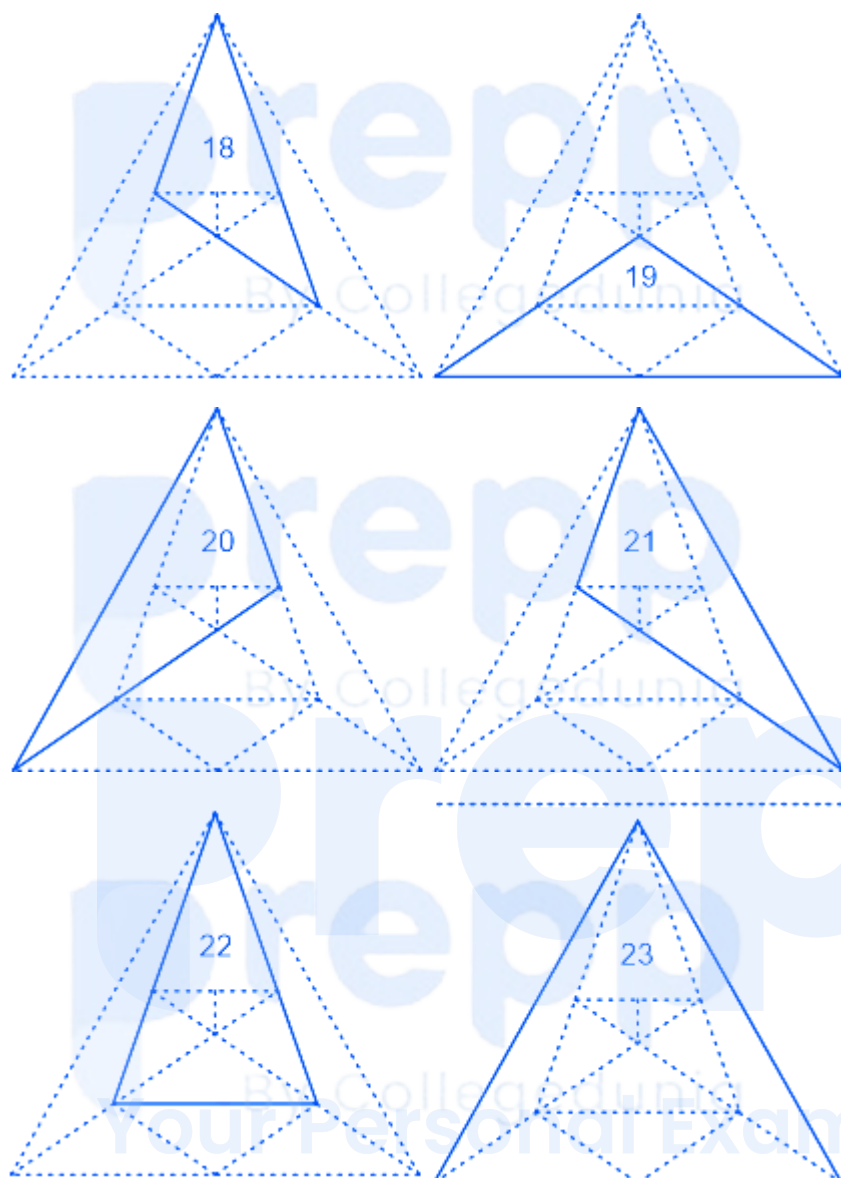
- Shahjahan's reign is also said to have marked the pinnacle of the **Mughal** dynasty and empire

64. Answer: b

Explanation:

The triangles are as follows:





The total number of triangles is 23.

Hence, "option 2" is the correct answer.

65. Answer: b

Explanation:

The correct answer is 1500 J.

★ Key Points

- Given,
 - Mass, $m = 30 \text{ kg}$.
 - Velocity, $v = 10 \text{ ms}^{-1}$.
- $\text{Kinetic Energy} = \frac{1}{2}mv^2$
 - $= \frac{1}{2}(30 \times 10^2)$
 - $= 1500 \text{ J}$.

★ Additional Information

- **Kinetic Energy:**
 - If a body of mass m is moving with velocity v , then kinetic energy
 - $KE = \frac{1}{2}mv^2 = \frac{P^2}{2m}$
 - where p is the linear momentum.
- When **momentum is doubled, kinetic energy becomes four times**.
- If a body is moving in a horizontal circle then its kinetic energy is the same at all points, but if it is moving in a vertical circle, then the kinetic energy is different at different points.

66. Answer: a

Explanation:

The teacher telling the students that 'water is a valuable resource' implies that

- water is important and the teacher wants the children to know it,
- since it is important it should not be wasted.
- Thus, both the assumptions are implicit.

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

67. Answer: b

Explanation:

Given:

largest 3 digit number

The number is divisible by 10, 8 and 12

Concept used:

When a number is divisible by a, b, and c, the number will be LCM (a, b, c)

Calculation:

Factors of 10 = 2×5

Factors of 8 = 2^3

Factors of 12 = $2^2 \times 3$

L.C.M. of (10, 8, 12) = 120

The largest 3 digit number = $120 \times 8 = 960$

$\therefore$ Required number is 960

68. Answer: d

Explanation:

Given:

$$\frac{2 \sin 30^\circ}{1 + \cos 30^\circ} + \frac{1 + \cos 30^\circ}{\sin 30^\circ}$$

Concept used:

	0°	30°	45°	60°	90°
sin	0	1/2	1/√2	√3/2	1
cos	1	√3/2	1/√2	1/2	0
tan	0	1/√3	1	√3	∞
cosec	∞	2	√2	2/√3	1
sec	1	2/√3	√2	2	∞
cot	∞	√3	1	1/√3	0

Calculation:

$$\frac{2 \sin 30^\circ}{1 + \cos 30^\circ} + \frac{1 + \cos 30^\circ}{\sin 30^\circ}$$

$$\Rightarrow \frac{2 \times 1/2}{1 + \sqrt{3}/2} + \frac{1 + \sqrt{3}/2}{1/2}$$

$$\Rightarrow \frac{1}{(2 + \sqrt{3})/2} + \frac{(2 + \sqrt{3})/2}{1/2}$$

$$\Rightarrow \frac{1}{\frac{(2 + \sqrt{3})}{2}} + \frac{\frac{(2 + \sqrt{3})}{2}}{\frac{1}{2}}$$

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

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

$$\Rightarrow (9 + 4\sqrt{3})/(2 + \sqrt{3})$$

$$\Rightarrow (9 + 4\sqrt{3})(2 - \sqrt{3})/(2 + \sqrt{3})(2 - \sqrt{3})$$

$$\Rightarrow (18 - 9\sqrt{3} + 8\sqrt{3} - 12)/(4 - 3)$$

$$\Rightarrow 6 - \sqrt{3}$$

∴ Required value is $6 - \sqrt{3}$

69. Answer: c

Explanation:

One of the angles between the hour hand and the minute hand when the clock shows 3:52 pm can be calculated using the following formula:-

$$\text{Angle} = |11/2 M - 30 H|$$

Where, M = minutes and H = hours.

Here, M = 52, H = 3

Therefore, we get angle = $|11/2 \times 52 - 30 \times 3| = |286 - 90| = 196^\circ$.

For the smaller angle, we subtract 196° from 360°

- $360^\circ - 196^\circ = 164^\circ$

Hence, "option 3" is the correct answer.

70. Answer: c

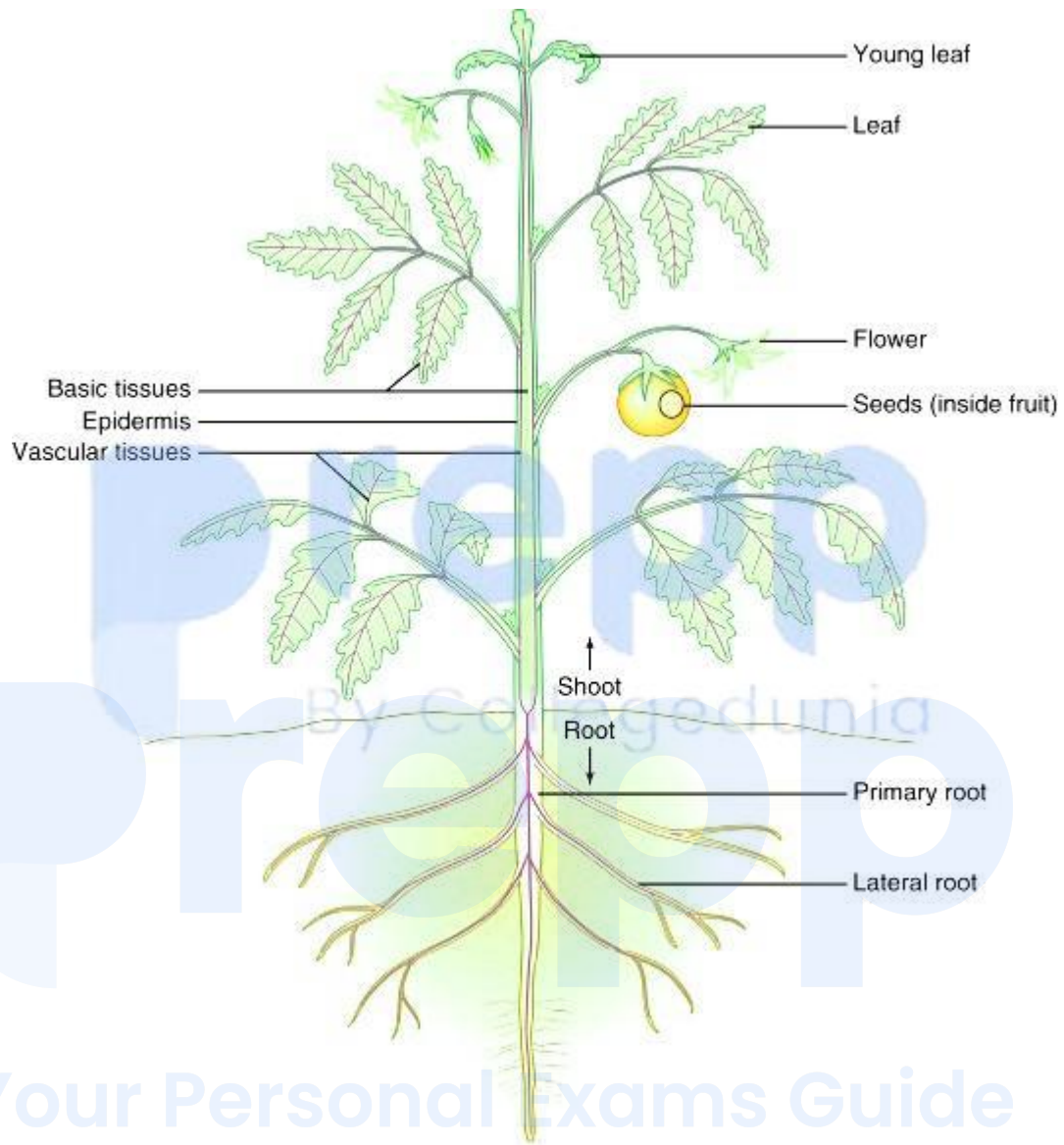
Explanation:

The correct answer is Vegetative propagation.

- Roots, stems, and leaves of some plants develop into new plants through the process of Vegetative propagation.

★ Key Points

- **Vegetative reproduction:**
 - It is any form of asexual reproduction occurring in plants in which a new plant grows from a fragment or from the cuts off of the parent plant or a specialized reproductive structure.
 - The roots, stems, and leaves of some plants develop into new plants through the same process.



71. Answer: a

Explanation:

The correct answer is Kerala.

- The tropical rainforest can be found in the Silent Valley of Kerala.

★ Key Points

- Tropical Rain Forests:

- These forests are **evergreen**.
- These are found in the **equatorial and the tropical regions** with more than **200 cms annual rainfall**.
- The leaves of trees in such **forests are very wide**.
- Examples: **Redwood, palm, etc.**
- As Kerala is located near the **equator** and always becomes a part of **Western Ghats, the tropical rainforest** can be found here.
- **Silent Valley National Park** is located in **Kerala**.

★ Additional Information

- **Tropical Dry Deciduous Forests** are found in **Rajasthan**.
- **Tropical Thorn Forest** is found in **Delhi**.
- **Deciduous and Evergreen Tropical Forests** are found in **Meghalaya**.

72. Answer: a

Explanation:

The logic followed here is:-

$$\begin{array}{cccccccc}
 1 & 4 & 9 & 25 & 49 & 121 & 169 & 289 & 361 \\
 \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\
 1^2 & 2^2 & 3^2 & 5^2 & 7^2 & 11^2 & 13^2 & 17^2 & 19^2
 \end{array}$$

- This is a series of squares of natural numbers in ascending order.

Hence, "option 1" is the correct answer.

73. Answer: d

Explanation:

The correct answer is Chenab Bridge.

- The Indian Railways has planned to build Chenab Bridge in Jammu and Kashmir by the year 2016, which will be the world's highest railway bridge.

★ Key Points

- **Chenab Bridge:**
 - It is the world's highest railway bridge.
 - It is being constructed by **Indian Railways**.
 - It is part of the **Udhampur–Srinagar–Baramulla rail link project (USBRL)**.
 - The Chenab bridge project was declared as a **Project of National Importance in March 2002**.
 - The length of the bridge is **1,315-metre** and its height is **359 metres** above the river bed level.

★ Additional Information

- **Indian Railways:**
 - **Indian Railway Board** was established in March **1905**.
 - Indian Railway was nationalised in **1950**.
 - Railways have been divided into **19 zones**.
 - The first Indian railway line in India was operated for public traffic in **1853** between **Mumbai and Thane** over a distance of 34 km.
 - **Ashwini Vaishnaw** is the current **Minister of Railways**.
 - The **first electric train** in India was '**Deccan Queen**'.
- It was introduced in **1929** between **Bombay and Poona**

74. Answer: d

Explanation:

Given:

Total sales of the store Rs. 10000

Calculation:

According to the question,

Sales of outdoor games = $10000 \times 40/100$

$\Rightarrow$ Rs. 4000

$\therefore$ The sale of outdoor games is Rs. 4000

75. Answer: a

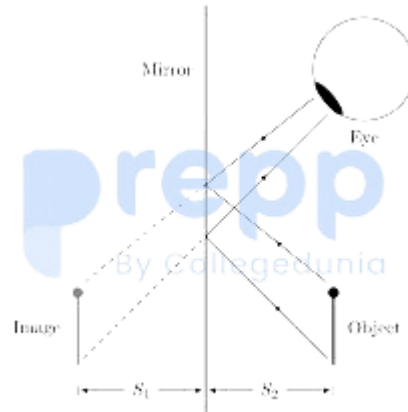
Explanation:

The correct answer is virtual and laterally inverted.

- The image for a plane mirror is virtual and laterally inverted.

★ Key Points

- **Reflection From Plane Mirror:**
 - The image is **virtual and laterally inverted**.
 - The **size of the image** is **equal to that of the object**.
 - The **distance of the image from the mirror** is **equal to the distance of the object from the mirror**.
 - If an object moves towards (or away from) a plane mirror with speed u , relative to the object, the image moves towards (or away) with a speed of $2u$.
 - If a plane mirror is rotated by an angle θ , keeping the incident ray fixed, the reflected ray is rotated by an angle 2θ .
 - To see his full image in a plane mirror, a person requires a mirror of at least half of his height.



★ Additional Information

- The image formed by a **concave mirror** is **real and virtual**.
- The images formed by a **convex mirror** is always **virtual and erect**.

76. Answer: a

Explanation:

Given:

Speed of the persons = 9.6 km/hr and 12 km/hr

Concept used:

If two trains or two buses are moving in the same direction at u m/s & v m/s, where $u > v$ then the relative speed in the same direction = $(u - v)$ m/s.

Calculation:

Let the length of the bus be 'N' m and the speed of the bus be 'A' km/h

Bus crosses 1st person walking at the speed of 9.6 km/h in the same direction as that in which the bus is heading in 4.5,

$$\Rightarrow N/(A - 9.6) = 1/800 \text{ [1 hour = 3600 sec]}$$

$$\Rightarrow 800N = A - 9.6 \quad \text{----1}$$

Bus crosses 2nd person walking at the speed of 12 km/h in the same direction as that in which the bus is heading in 9 s,

$$\Rightarrow N/(A - 12) = 1/400 \text{ [1 hour = 3600 sec]}$$

$$\Rightarrow 400N = A - 12 \quad \text{-----2}$$

Solving equations 1 and 2,

$$\Rightarrow 400N = 2.4 \text{ km}$$

$$\Rightarrow N = 6 \text{ m}$$

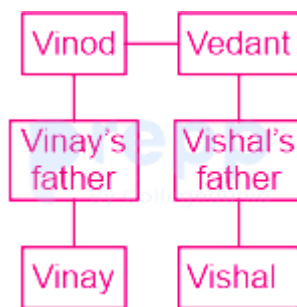
$\therefore$ The length of the bus is 6 m.

77. Answer: a

Explanation:

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

The family tree is given below:-



Vishal's father is the cousin brother of Vinay's father.

Hence, "option 1" is the correct answer.

Note: This question was ignored in the official paper due to a discrepancy. Therefore, we have modified this question to make it logical.

78. Answer: a

Explanation:

Concept:

- **Work is said to be done** by a force when the body is displaced actually through some distance in the direction of the applied force.
- Since the body is being displaced in the direction of F , therefore work done by the force in displacing the body through a distance s is given by:

$$W = \vec{F} \cdot \vec{s}$$

$$\text{Or, } W = Fs \cos \theta$$

So, from this, we can conclude that

- Work done is positive when the direction of both force and displacement are the same
- Work done is negative when the direction of force and displacement are the opposite.
- Whereas work is done is zero when direction force (Centripetal force) and displacement are perpendiculars this case is true for an object moving in a

circular motion

Explanation:

- Work done is not dependent on Time taken.
- It is **dependent on Force and displacement**.
- Since there is no change in any of them here.
- They displace the same upward displacement, so they do the same work.
- Hence Ram and Shyam have done an equal amount of work done.

★ Mistake Points

- In terms of power, they do different unit.
- As power equals = (Work done/Time)
- Shyam consumes more power than Ram or Shyam is more efficient.

79. Answer: c

Explanation:

The logic followed here is:-

All figures are made with four lines and then the fourth part is also made with four lines. Figure D is made of four lines

Therefore, the series will be as follows:



Hence, "option 3" is the correct answer.

80. Answer: c

Explanation:

The correct answer is Vijay Rupani.

- Vijay Rupani is the Chief Minister of Gujarat as of March 2017.
- Bhupendrabhai Patel is the current CM of Gujarat (as of June 2022)

★ Key Points

- **Vijay Rupani:**
 - He was the **16th Chief Minister of Gujarat** from **2016 to 2021**.
 - His constituency is **Rajkot West**.
 - He is a member of **Bharatiya Janata Party (BJP)**.
 - He also served as the **Minister of Transport, Minister of Labour & Employment, and Minister of Water Supply of Gujarat.**



- **Bhupendrabhai Patel** is the **current chief minister of Gujarat as of January 2022**.
 - He is from the **Ghatlodia constituency**.

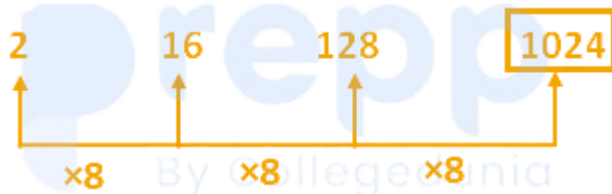
★ Additional Information

- **Shankar Singh Vaghela** was the **12th Chief Minister of Gujarat**.
- **Narendra Modi** was the **14th Chief Minister of Gujarat**.
- **Keshubhai Patel** was the **10th Chief Minister of Gujarat**.

81. Answer: d

Explanation:

The logic followed here is:-



Hence, "option 4" is the correct answer.

82. Answer: b

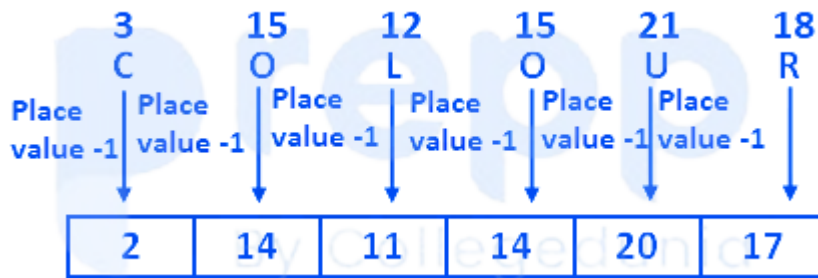
Explanation:

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

The logic followed here is:-



Similarly,



Hence, "option 2" is the correct answer.

83. Answer: c

Explanation:

The logic followed here is:-

- L and positional value of L is 12 present in figure A,
- C and positional value of C is 3 present in figure B,
- E and positional value of E present in figure C, and
- O and positional value of O is 15 but 16 present in figure D.

So, Figure D is different from others.

Hence, "option 3" is the correct answer.

84. Answer: a

Explanation:

From the given table we can say,

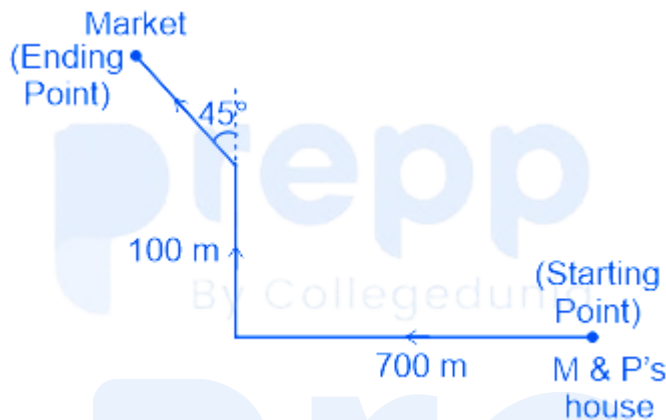
Average score of both teams is 2 [12 goals in 6 games]

∴ Team A and Team B have the same average score.

85. Answer: c

Explanation:

The figure is given below:-



Market is in the north-west of his house.

Hence, "option 3" is the correct answer.

86. Answer: b

Explanation:

Given:

outer and inner perimeter = 220 m and 44 m

Formula used:

$$\text{Area of path} = \pi(r_1^2 - r_2^2)$$

Calculation:

Let R be the outer radius and r be the inner radius

$$2\pi R = 220 \text{ m}$$

$$\Rightarrow 110 \times 7/22 = 35 \text{ m}$$

$$2\pi r = 44 \text{ m}$$

$$\Rightarrow 22 \times 7/22 = 7 \text{ m}$$

Now,

$$\text{Area of the path} = \pi(R^2 - r^2)$$

$$\Rightarrow 22/7(1225 - 49)$$

$$\Rightarrow 22/7 \times 1176$$

$$\Rightarrow 3696 \text{ m}^2$$

$\therefore$ The area of the path is 3696 m²

87. Answer: c

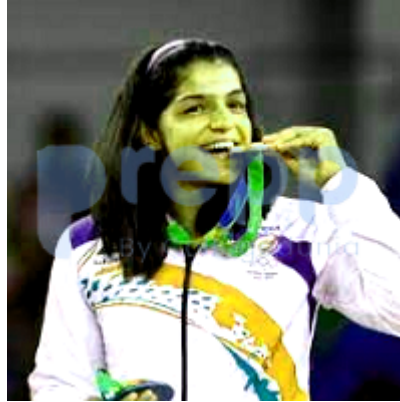
Explanation:

The correct answer is Sakshi Malik.

- Sakshi Malik was awarded Padma Shri in 2017.

★ Key Points

- **Sakshi Malik:**
 - She is a **freestyle wrestler**.
 - she won the **bronze medal** in the **58 kg category** at the **2016 Summer Olympics**.
 - She became the **first Indian female wrestler** to win a medal at the **Olympics**.
 - She also won the **silver medal** at the **2014 Commonwealth Games** in **Glasgow**.
 - She was awarded **Padma Shri** in 2017.
 - She was awarded the **Major Dhyan Chand Khel Ratna** in the year **2016**.



88. Answer: b

Explanation:

Given:

Distance = 500 m

Time = 25 sec

Concept used:

Speed = D/t

D = distance

t = time

Calculation:

Speed = $500/25$

$\Rightarrow 20 \text{ m/sec}$

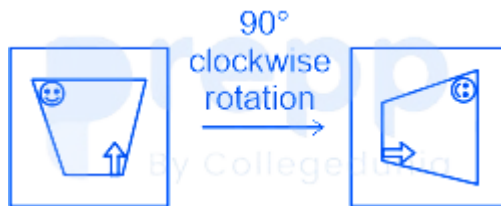
$\therefore$ The average speed of an athlete is 20 ms^{-1}

89. Answer: b

Explanation:

The logic followed here is:-

- When the question figure rotates 90° clockwise, we get figure C.



Hence, "option 2" is the correct answer.

90. Answer: a

Explanation:

His total income = Rs. 55000

Spend on EMI = $55000 \times 46/100$

$\Rightarrow$ Rs. 25300

$\therefore$ EMI to be paid by him in each month is Rs. 25300

91. Answer: d

Explanation:

Given:

Two pipes take 3.9 hours and 5.2 hours to fill the cistern

Third pipe can empty a cistern in 10.4 hrs

Concept used:

Total work = LCM of times of pipes or persons

Calculation:

LCM of 3.9, 5.2, and 10.4 is 31.2 i.e total work

So, efficiency of pipes = 8, 6, - 3

Effective efficiency = $14 - 3 = 11$

$\frac{11}{12}$ of the cistern = $31.2 \times 11/12$

$\Rightarrow 28.6$

Time = $28.6/11$

$\Rightarrow 2.6$ hours or 2 hours 36 minutes

$\therefore$ it will take 2 hours 36 minute to fill the tank completely

92. Answer: b

Explanation:

The correct answer is momentum.

- The product of mass and velocity is momentum.

★ Key Points

- **Momentum**
 - Momentum is the property of a moving body and is **defined as the product of the mass and velocity of the body** .
 - It is a **vector quantity** .
 - Its **SI unit** is **kg m/s**.

★ Additional Information

- **Impulse**
 - When a large force acts on a body for a very small period, then force is called impulsive force.
 - Impulse is defined as the product of force and time.
 - It is a vector quantity and its direction is the direction of force.
 - Its SI unit is Newton-second (Ns).
- Pressure is defined as a **force acting normally on the unit area on the surface**.
 - **SI unit** of pressure is **N/m^2** also called **Pascal**.

93. Answer: b

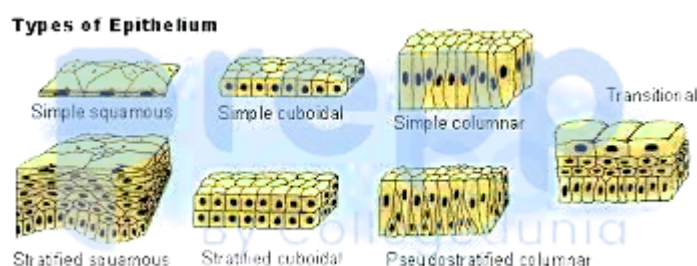
Explanation:

The correct answer is the simple squamous epithelium.

- Simple squamous epithelium tissue makes up the inner lining of our mouth.

★ Key Points

- **Simple squamous epithelium:**
 - It is a single layer of flat scale-shaped cells.
 - This tissue makes up the **inner lining of the mouth and blood vessels**.
 - It also makes the **mesothelial lining of the body cavities**.



★ Additional Information

- **Ciliated columnar epithelium** tissues are found in the **fallopian tube and parts of the respiratory system**.
- **Stratified squamous epithelium** tissues are found in the organ system where the body comes into close contact with the outside environment

- Columnar epithelium tissues are found in the stomach and intestines.

94. Answer: b

Explanation:

The logic followed here is:-

Milk, Oil, and Petrol are liquids and a can is used to store liquids.

So, "can" is different from others.

Hence, "option 2" is the correct answer.

95. Answer: d

Explanation:

The statement asks whether opinion polls be held before the elections.

- Argument I agrees with it and states that it helps the public understand the election scenario which is not true. As the name suggests, opinion polls are usually not impartial. They are based on the opinions of a few people. Thus, it is not a reliable way of understanding the election scenario. So, argument I is not strong.
- If opinion polls are biased, then there is no point in continuing or holding such polls and hence they should be cancelled. Thus argument II is strong.

Hence the correct answer is option 4.

96. Answer: c

Explanation:

Given:

$$\frac{131}{255} + \frac{2}{5} + 5 - \frac{17}{3}$$

Calculation:

$$\frac{131}{255} + \frac{2}{5} + 5 - \frac{17}{3}$$

$$\Rightarrow (131 + 102 + 1275 - 1445)/255$$

$$\Rightarrow 63 / 255$$

∴ Required answer is 63/255

97. Answer: c

Explanation:

The correct answer is Economics.

- Professor Amartya Sen is famous in the field of e conomics.

★ Key Points

- **Amartya Sen:**
 - He is a famous economist and philosopher.
 - He won the **Bharat Ratna** award in the year **1999** .
 - He was awarded the **Nobel Memorial Prize** in **Economic Sciences** in **1998**.



98. Answer: a

Explanation:

The correct answer is Paris.

- Paris is the capital city of France.

★ Key Points

- France:
 - **Capital:** Paris
 - **President:** Emmanuel Macron (As of Jan 2022).
 - **Prime Minister:** Jean Castex (As of Jan 2022).
 - **Currency:** Euro

99. Answer: c

Explanation:

Given:

An object travels 25 m in 3 s and then another 15 m in 25 s.

Concept used:

Average speed = Total distance/Total time

Calculation:

Total distance = 25 + 15 = 40 m

Total time = 3 + 2 = 5 sec

Average speed = $40/5 = 8 \text{ m/s}$ or 8 ms^{-1}

$\therefore$ The average speed of the object 8 ms^{-1}

100. Answer: c

Explanation:

Given:

$$x^2 + 1.5kx + 4.5k = 0$$

Concept used:

$$b^2 - 4ac = 0$$

Calculation:

Here $b = 1.5k$

$a = 1$

$c = 4.5k$

Now, putting these values into the equation.

$$1.5k^2 - 4 \times 1 \times 4.5k = 0$$

$$\Rightarrow 2.25k^2 - 18k = 0$$

$$\Rightarrow k(2.25k - 18) = 0$$

$$\Rightarrow k = 0 \text{ or } k = 18/2.25 = 8$$

$\therefore$ The satisfactory value of k will be $k = 8$ or $k = 0$