



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 (28-Sep-2018) (Shift 1)

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. An object travels 10 m in 4 s and then another 14 m in 2 s. What is the average speed of the object? (+1, -0.33)
 - a. 4.5 ms^{-1}
 - b. 4 m
 - c. 4 s^{-1}
 - d. 4 ms^{-1}

2. The molten material mixed with gases in the mantle of the Earth is called _____. (+1, -0.33)
 - a. Magma
 - b. Helium
 - c. Core
 - d. Lava

3. How many groups and periods are there in the Modern Periodic Table? (+1, -0.33)
 - a. 7 group and 18 periods
 - b. 7 groups and 7 periods
 - c. 18 groups and 7 periods
 - d. 18 groups and 18 periods

4. What is the sum of the reciprocals of the values of zeroes of the polynomial $6x^2 + 3x^2 - 5x + 1$? (+1, -0.33)

- a. 2
- b. 3
- c. 4
- d. 5

5. Find the odd one out. (+1, -0.33)

A	B	C	D
O15	C3	G7	N15

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

6. What is the valency of copper in cuprous oxide? (+1, -0.33)

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

d. 1

7. 315 marbles are distributed among Aman, Ashok and Alok in the ratio 7 : 3 : 5, respectively. How many more marbles did Aman get compared to Ashok? **(+1, -0.33)**

a. 84

b. 42

c. 147

d. 63

8. _____ does NOT contain carbonyl group. **(+1, -0.33)**

a. Aldehyde

b. Carboxyl acid

c. Ketone

d. Ethanol

9. One of the two inlet pipes works twice as efficiently as the other. The two can fill the empty cistern in 12 hours. A drain pipe can empty a cistern all by itself in 12 hours. How many hours will the more efficient inlet pipe take to fill the empty cistern by itself? **(+1, -0.33)**

a. 9

b. 15

c. 12

d. 18

10. The Battle of Plassey was fought on _____. (+1, -0.33)

- a. 23rd June 1557
 - b. 23rd June 1657
 - c. 23rd June 1857
 - d. 23rd June 1757
-

11. Which assumptions are implied from the below statement? (+1, -0.33)

Statement: "In 10 years, the real impact of unscrupulous use of plastics would be felt", says an ecologist.

Assumptions:

- I. Plastic is non-decomposable
- II. Plastic affects the ecological balance

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

12. The point at which all rays converge is termed as _____. (+1, -0.33)

- a. Principle axis

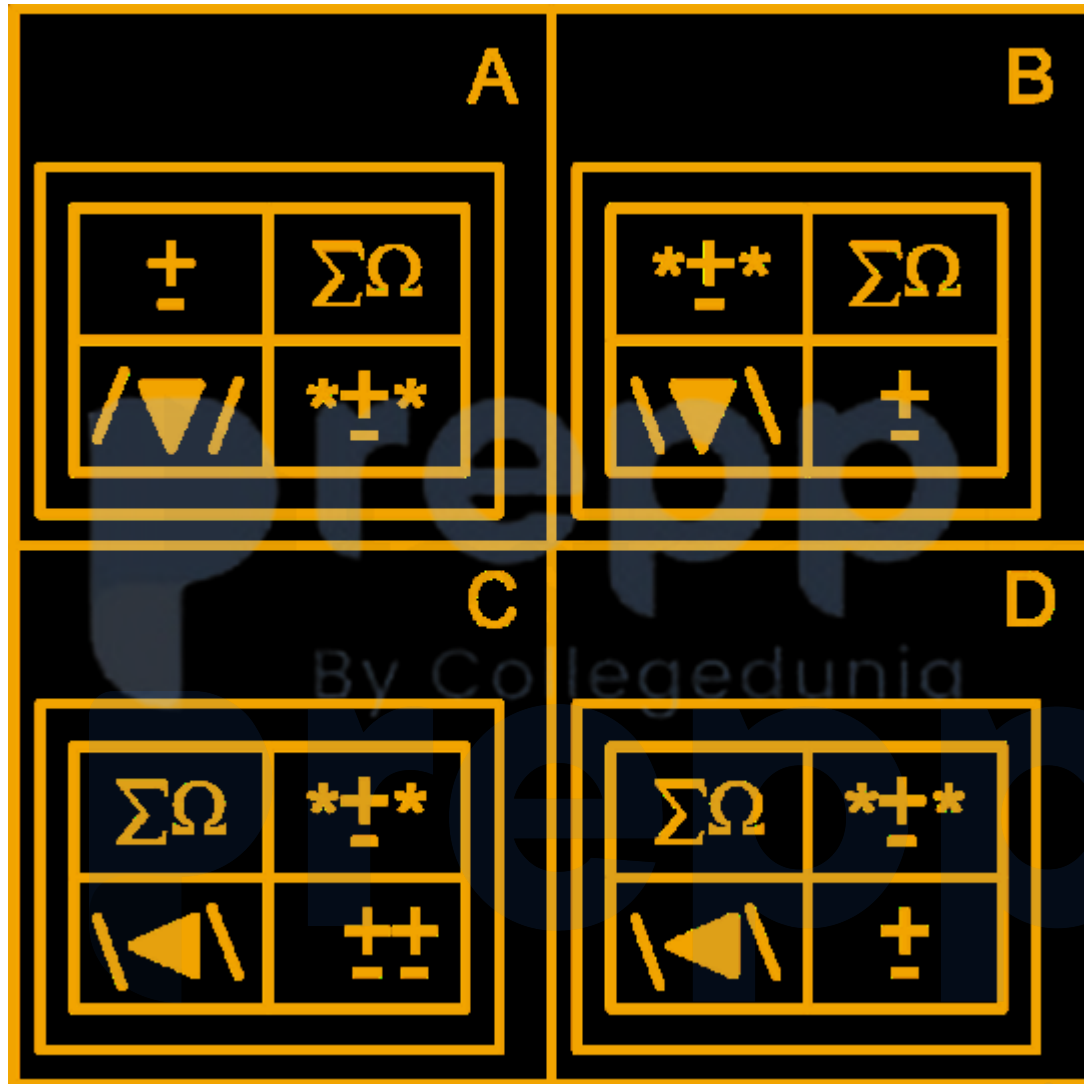
- b. Pole
- c. Aperture
- d. Focus

13. If E and A are daughters of B and A is married to V, then how is V related to E? (+1, -0.33)

- a. Son-in-law
- b. Father-in-law
- c. Brother-in-law
- d. Mother-in-law

14. Select the option that can replace the question mark (?) in the following series. (+1, -0.33)





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

15. $4x^2 + kx + 5$ is divisible by $x + 1$. The same expression is also divisible by: (+1, -0.33)

- a. $4x + 5$

b. $4x - 1$

c. $4x - 5$

d. $x - 5$

-
16. Garima and her sister together can paint the walls of their house in 45 days. If Garima alone did the job, it would have taken her 81 days. If the duo started painting together but Garima's sister had to leave 9 days before the completion of the work, how many days in all would it take the sisters to paint their house? (+1, -0.33)

a. 49

b. 48

c. 52

d. 50

-
17. _____ has the greatest electron affinity. (+1, -0.33)

a. Br

b. Cl

c. I

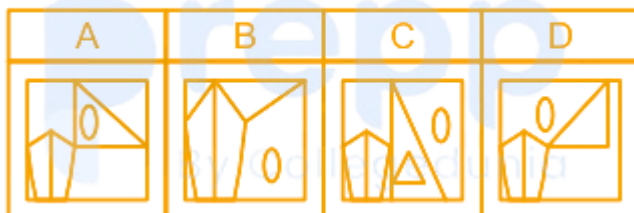
d. F

-
18. Which of the answer figures is formed from the shapes given the problem figure? (+1, -0.33)

Problem Figure:



Answer Figures



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

19. _____ was the Finance Minister of the Mughal empire during Akbar's reign. (+1, -0.33)

- a. Birbal
- b. Raja Man Singh I
- c. Tansen
- d. Raja Todar Mal

20. You are given a question and two statements. Identify which of the statements is/are sufficient to answer the question. (+1, -0.33)

Question:

Nayan has 4 caps of 3 different colours. How many blue caps does he have?

Statements:

1. Nayan has 2 white caps.
 2. The number of blue caps he has is the same as that of white caps.
- a. Statement 1 alone is not sufficient.
 - b. Statements 1 and 2 together are sufficient.
 - c. Statements 1 or 2 alone are sufficient.
 - d. Statement 2 alone is not sufficient.

21. Read the statement below along with two conclusions. (+1, -0.33)

Statement:

Naina asks for pen from Mahi.

Conclusions:

- I. Naina doesn't have a pen
- II. Naina wants to write something

Which conclusion(s) follow(s) the given statement?

- a. Both the conclusions follow
- b. Conclusion I alone follows
- c. Neither I nor II follows
- d. Conclusion II alone follows

22. _____ is the mobile application launched by the Ministry of Commerce and Industry to aid exporters and importers in the country. (+1, -0.33)

- a. Nikat Man
- b. Maitree Mitra
- c. Niryat Mitra
- d. Dikhat Mitra

23. A year ago, Akash's father's age was 9 times that of Akash. After 3 years his father's age will be 5 times that of his age. How old will Akash be next year? (+1, -0.33)

- a. 4 years
- b. 5 years
- c. 8 years
- d. 6 years

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



- a. 8
- b. 12
- c. 11
- d. 17

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25. _____ mutation is NOT hereditary.

(+1, -0.33)

- a. Deletion
- b. Insertion
- c. Somatic
- d. Duplication

26. Which of the following is NOT a perfect square?

(+1, -0.33)

- a. 1250
- b. 16641
- c. 2025
- d. 9801

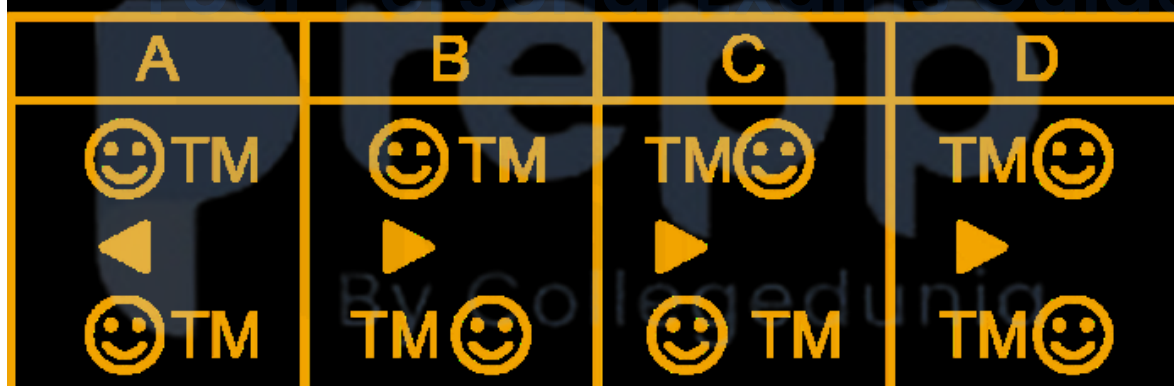
27. Select the option figure that will complete the series of question figures.

(+1, -0.33)

Question figures:



Answer figures:



- a. D
- b. C

c. A

d. B

28. Which Indian has been crowned Miss Teen Universe 2017 at Managua, the capital of Nicaragua? (+1, -0.33)

a. Neeru Chadha

b. Nisha Dutt

c. Simran Khosla

d. Srishti Kaur

29. Voluntary muscles are contained in the _____. (+1, -0.33)

a. Heart

b. Hind limb

c. Liver

d. Lung

30. Choose the correct alternative to complete the pattern: (+1, -0.33)

1224364860, 1122334455, 1020304050, _____.

a. 918273642

b. 918273644

c. 918273645

d. 918273643

31. Which state government launched the 'Gobar-dhan' scheme to support farmers? (+1, -0.33)

- a. Uttar Pradesh
- b. Haryana
- c. Rajasthan
- d. Punjab

32. Consider the given statement(s) and decide which of the given assumption(s) is/are implicit in the statement. (+1, -0.33)

Statement:

"Tomorrow morning the hockey team will report by 9:00 am instead of 8:00 am for practice," said the coach.

Assumptions:

- I. That day coach had some other work at 8:00 am.
- II. They usually assemble for practice.

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

33. Which one of the following groups produces naked seeds? (+1, -0.33)

- a. Angiosperms
- b. Bryophyta
- c. Thallophyte
- d. Gymnosperms

34. Find the next term in the following series: (+1, -0.33)

31, 38, 44, 51, _____.

- a. 58
- b. 57
- c. 51
- d. 55

35. The ratio of the area of a square to the area of a regular hexagon, having the same perimeter is: (+1, -0.33)

- a. 2 : 3
- b. $\sqrt{3} : 2$
- c. 1 : $\sqrt{3}$
- d. 4 : $3\sqrt{3}$

36. $\frac{3}{12}$ of $\left(\frac{\frac{2}{5} + \frac{4}{15}}{\frac{3}{5} - \frac{2}{5}}\right) = ?$ (+1, -0.33)

- a. $5/7$
 - b. $5/6$
 - c. $6/5$
 - d. $2/6$
-

37. What is the next term in this series?

(+1, -0.33)

L, D, O, E, R, F, ?

- a. K
 - b. S
 - c. U
 - d. Q
-

38. The electoral college who elects the President of India is formed by

(+1, -0.33)

-----.

- a. Head of the Parliament
 - b. Governor
 - c. Former President
 - d. Elected members of the Parliament and the State Legislative Assemblies
-

39. An element of atomic number 16 will belong to the _____ period of the periodic table.

(+1, -0.33)

- a. 5th
 - b. 6th
 - c. 3rd
 - d. 4th
-

40. An electric bulb of 100 W is used 8 hours per day. The energy consumed by the bulb in one day is _____ units. (+1, -0.33)

- a. 800
 - b. 80
 - c. 8
 - d. 0.80
-

41. As of February 2018, who was the spokesperson of the Indian Navy? (+1, -0.33)

- a. Captain D.K. Sharma
 - b. Admiral Suresh Bhatt
 - c. Captain M.K. Sharma
 - d. Pranab Mukherjee
-

42. Pipe C and D alone can fill a tank in 4 and 5 hours, respectively. If pipe C is closed after 3 hours and at the same time pipe D is opened, in how many hours will the tank get filled? (+1, -0.33)

- a. 0.8

b. 1.25

c. 1

d. 1.5

43. $\{52 - (9 - 2)\} \div [3 \times \{1 + (-2) \times (-2)\}] = ?$ (+1, -0.33)

a. 3

b. -9

c. 9

d. -5

44. Nikhil meets a boy at the park. The boy identifies Nikhil as his father's younger brother. Nikhil is the boy's ----- (+1, -0.33)

a. Father

b. Maternal uncle

c. Cousin

d. Paternal uncle

45. Football was officially included as a competitive game in Olympics in ----- (+1, -0.33)

a. 1908

b. 1924

c. 1916

d. 1900

46. What is the area of the triangle whose vertices are $A(-4, -2)$, $B(-3, -5)$ and $C(3, -2)$? (+1, -0.33)

a. 12 sq. units

b. 10 sq. units

c. 7.5 sq. units

d. 10.5 sq. units

47. A and B can do a piece of work together in 15 days while A alone can do it in 25 days. They start working together but B leaves 5 days before the completion of the work. For how many days did A and B work together? (+1, -0.33)

a. 10

b. 13

c. 9

d. 12

48. The Second Equation of Motion gives the relationship between _____ and Time. (+1, -0.33)

a. Acceleration

b. Position

- c. Momentum
 - d. Velocity
-

49. If two charged bodies having equal potential are connected through a conducting wire, then: (+1, -0.33)

- a. Magnetic induction flows
 - b. Current flows from positive to negative
 - c. Current will not flow
 - d. Current will flow from negative to positive
-

50. Who among the following won the 'ITA Sterling Icon of Indian Entertainment' Award at the 17th edition of the Indian Television Academy Awards held in November 2017? (+1, -0.33)

- a. Jitendra
 - b. Ekta Kapoor
 - c. Siddarth Roy Kapur
 - d. Shobha Kapoor
-

51. V is the daughter of MX and N is the daughter of NX. MX and NX have the same father. V and N are: (+1, -0.33)

- a. Sister-in-law
- b. Cousins

- c. Paternal Aunt
- d. Maternal Aunt

52. What is the horizontal mirror image of HAY?

(+1, -0.33)



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

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53. The Rajiv Gandhi Khel Ratna Awardee receives a cash price of rupees _____.(before 2020)

(+1, -0.33)

- a. 7.5 lakh
- b. 7 lakh
- c. 25 lakh
- d. 10 lakh

54. How many triangles are there in the below figure?

(+1, -0.33)



- a. 6
- b. 13
- c. 10
- d. 8

55. " A table, a chair, a bowl of fruit and a violin: what else does a man need to be happy ?" was said by

(+1, -0.33)

- a. Albert Einstien
- b. Alexander Graham bell
- c. Sir Isac Newton
- d. Alan Turing

56. Compressions and rarefactions are due to variability of _____

(+1, -0.33)

- a. Magnetic difference
- b. Ray refraction

- c. Air pressure
 - d. Temperature difference
-

57. Tarun and Tapan started a partnership with investments of Rs. 13,000 and Rs. 19,500 respectively, however, due to a financial emergency, Tapan had to withdraw his investment after 8 months. In what ratio should the profit of the first 12 months be shared among the duo? (+1, -0.33)

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

58. India is the _____ most populated country in the world. (+1, -0.33)

- a. Fourth
 - b. First
 - c. Third
 - d. Second
-

59. What is the formula of average velocity? (+1, -0.33)

- a. $V_{av} = (u - v) / 2$
- b. $V_{av} = (u + v) / 2$
- c. $V_{av} = u + v$

d. $V = S \times t$

60. The volume of sales in a store is recorded for four different quarters. The following is the data. (+1, -0.33)

Quarters	Volume of sales
Quarter 1	200
Quarter 2	100
Quarter 3	350
Quarter 4	550

What are the average sales per quarter?

- a. 250
- b. 300
- c. 350
- d. 500

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

- A. Tunnel
- B. Bunker

C. Well

D. Building

a. B

b. D

c. A

d. C

62. Jayant introduces a man to his friend as his wife's father's son. The man is Jayant's _____. (+1, -0.33)

a. Brother-in-law

b. Sister-in-law

c. Father-in-law

d. Daughter-in-law

63. The filtration units in the human kidney are known as _____. (+1, -0.33)

a. Nephrons

b. Protons

c. Neutrons

d. Neurons

64. Two trains, one 153 m long and the other 127 m long, coming from opposite directions crossed each other in 7.2 seconds. The combined speed of the two trains every hour would then be: (+1, -0.33)

- a. 140 km/h
- b. 105 km/h
- c. 70 km/h
- d. 280 km/h

65. If the chromosome number is 46 in a human being, how many chromosomes are present in somatic cells of the human being? (+1, -0.33)

- a. 24
- b. 46
- c. 23
- d. 48

66. A fraction when added to $\frac{7}{8}$ gives 4. The said fraction is: (+1, -0.33)

- a. $3\frac{1}{8}$
- b. $-\frac{1}{2}$
- c. $\frac{2}{3}$
- d. $\frac{11}{2}$

67. $4 + 3 \times 4 + 3 \times 4^2 + 3 \times 4^3 + 3 \times 4^4 + 3 \times 4^5 = ?$

(+1, -0.33)

- a. 5×4^5
- b. 9×4^4
- c. 4^6
- d. 10×4^4

68. Who is the current (as of July 2018) Governor of Reserve Bank of India (RBI)?

(+1, -0.33)

- a. Arvind Subramanian
- b. Urjit Patel
- c. Amitabh Kant
- d. Raghuram Rajan

69. Study the following questions and statement, and decide which of statements is/are sufficient to answer the question.

(+1, -0.33)

Question:

J, K, L, M, N and O are standing in a row. If we arrange them according to their height from tallest to shortest, who is standing in the third place?

Statements:

- 1. L is the tallest
- 2. J is taller than K

3. N is the shortest of all
4. K is taller than O
- a. All the statements are insufficient
- b. Statements 1, 2 and 3 sufficient
- c. Statements 1, 2, 3 and 4 together are sufficient
- d. Statements 1 and 3 are sufficient
-

70. Which of the numbers given below is NOT rational? (+1, -0.33)

- a. $\sqrt[4]{32}$
- b. $\sqrt[3]{64}$
- c. $\sqrt[5]{32}$
- d. $\sqrt[3]{27}$
-

71. _____ is semiconductor. (+1, -0.33)

- a. Ga
- b. Pb
- c. Ge
- d. Sn
-

72. If $3x^2 + ax + 4$ is perfectly divisible by $x - 8$, then the value of a is: (+1, -0.33)

- a. 24.5
- b. -25.5
- c. -24.5
- d. 25.5

73. Study the following question and decide which of the statements is/are sufficient to answer the question. (+1, -0.33)

Questions:

What is the total age of Nakul and Dwij?

Statements:

- 1. Nakul is 12 years old today.
 - 2. Dwij is younger to Nakul by 3 years.
- a. Statement 1 and 2 together are insufficient
 - b. Statements 1 and 2 together are sufficient
 - c. Statement 1 alone is sufficient
 - d. Statement 2 alone is sufficient

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

- A. Poetry
- B. Sonnet
- C. Rhyme

D. Diagram

a. B

b. A

c. C

d. D

75. Which of the following correctly represents the relationship between the given classes? (+1, -0.33)

A. Spades

B. Hearts

C. Deck or cards



d.

76. The electric configuration of four elements is given below. Which one among the following will be more electronegative? (+1, -0.33)

- a. Al(2, 8, 3)
- b. P(2,8,5)
- c. Cl(2,8,7)
- d. S(2,8,6)

77. To dispose of the old stocks, a person sold a tea-set for Rs. 3,540, which was 41% below the cost price. In order to make a profit of 11% the seller should have sold the set for _____ more. (+1, -0.33)

- a. 2664.42
- b. 2460
- c. 1812.60
- d. 3120

78. Which of the following is the official currency of the European Union? (+1, -0.33)

- a. Yen
 - b. Dollar
 - c. Euro
 - d. Pound
-

79. How many factors of 512 are perfect squares? (+1, -0.33)

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

80. India celebrates its Constitution Day on _____. (+1, -0.33)

- a. 15th December
- b. 26th November
- c. 21st August
- d. 26th January

81. An object has a potential energy of 400 J with a mass of 20 kg and gravity of 10 N kg⁻¹. The height of the object is (+1, -0.33)

- a. 0.5 m
- b. 4 m
- c. 1 m
- d. 2 m

82. With which sport is B Sai Praneeth associated? (+1, -0.33)

- a. Cricket
- b. Kho-Kho
- c. Taekwondo
- d. Badminton

83. In which of the following field Udipi Ramachandra Rao has been awarded 'Padma Vibhushan' by the Government of India in 2017? (+1, -0.33)

- a. Sports
- b. Science
- c. Literature
- d. Music

84. Which of the below is NOT a city/village/town of Rajasthan? (+1, -0.33)

- a. Tonk
- b. Nagaur
- c. Sikar
- d. Navsari

85. _____ is not acidic. (+1, -0.33)

- a. SbCl_4
- b. CCl_4

c. PCl_4

d. PCl_3

86. A shopkeeper sold two items, one at 25% profit and another at 15% loss and got a profit of Rs. 35. If the cost price of the item sold at 25% profit is twice than that of the item sold at 15% loss, find the sum of the cost price of both items. (+1, -0.33)

a. Rs. 300

b. Rs. 200

c. Rs. 100

d. Rs. 400

87. What is the next term in the given series? (+1, -0.33)

22A, 42E, 62I, ? _____.

a. 82 M

b. 82 N

c. 82 K

d. 82 S

88. An object travels 15 m in 4 s and then another 16 m in 3 s. What is the average speed of the object? (+1, -0.33)

a. 5.17 ms^{-1}

b. 4.43 ms^{-1}

c. 5.00 s^{-1}

d. $6.17 \text{ m}^{\text{s}^{-1}}$

89. The law of definite proportions was stated by _____. (+1, -0.33)

a. Democritus

b. Lavoisier

c. Proust

d. John Dalton

90. Which of the shapes in the options are combined to form the given shape? (+1, -0.33)





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

91. The Human Development Index was developed by _____ in 1990. (+1, -0.33)

- a. Mahbub Khan
- b. Aparna Sen
- c. Syed-ul-Haq
- d. Mahbub-ul-Haq and Amartya Sen

92. If PIG is coded as 1697, then what will be the code for GOAT? (+1, -0.33)

- a. 715122
- b. 715120
- c. 715123

d. 715121

93. By what number should $6\frac{2}{9}$ be multiplied to get 40? (+1, -0.33)

a. $5\frac{3}{7}$

b. 6

c. $2/9$

d. $6\frac{3}{7}$

94. Leela introduces two girls to her friend as the daughters of the only sister of her father. Leela and the girls are ----- (+1, -0.33)

a. Cousins

b. Friends

c. Nieces

d. Twins

95. Murali takes his dog for a walk. He turns left at a crossroad and faces South. Towards which direction was he walking before turning left? (+1, -0.33)

a. East

b. North

c. West

d. South

96. A solution turns blue litmus to red, its pH is likely to be _____. (+1, -0.33)

- a. 9
- b. 8
- c. 6
- d. 7

97. If the standard deviation of 0, 1, 2, 3 _____ 9 is K, then the standard deviation of 10, 11, 12, 13 _____ 19 will be: (+1, -0.33)

- a. $K + 1$
- b. K
- c. $K + 4$
- d. $K + 8$

98. Who was appointed as the new Director General of Military Operations of the Indian Army in 2018? (+1, -0.33)

- a. Sarath Chand
- b. Anil Chauhan
- c. Ranbir Singh
- d. A.K. Bhatt

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

Statement:

There is an increase in mobile usage and cell phone towers.

Arguments:

I. It shows global development and fast and easy way to get connected with the wider world.

II. In the long run, there will be more signals that will affect the normal functioning of the ecological systems.

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

100. How many balls, each of radius 1 cm, can be made from a steel sphere whose radius is 6 cm? (+1, -0.33)

- a. 126
- b. 27
- c. 64
- d. 216

Answers

1. Answer: d

Explanation:

Given:-

Objects travels:

⇒ 10 m in 4 s

⇒ 14 m in 2 s

Formula used:-

⇒ Time = Distance/Speed

Calculation:-

As we know,

⇒ Average speed = Total Distance/Total Time

⇒ Total distance = 10 + 14 = 24 m

⇒ Total time = 4 + 2 = 6

⇒ Average Speed = $24/6 = 4 \text{ ms}^{-1}$

2. Answer: a

Explanation:

The correct answer is magma.

★ Key Points

- Magma is hot liquid rock that is found just below the surface of the earth.
- It is formed from the melting of rocks in the earth's lithosphere, the outermost shell of Earth's surface.
- Lava is hot molten rocks that gets erupted outside from the volcano.

3. Answer: c

Explanation:

- Periodic table is the tabular arrangement of chemical elements.
- The Modern Periodic table consists of 18 groups and 7 periods.

Group →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Period ↓																		
1	H																	He
2	Li	Be											B	C	N	O	F	Ne
3	Na	Mg											Al	Si	P	S	Cl	Ar
4	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
5	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
6	Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
7	Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Nh	Fl	Mc	Lv	Ts	Og

Lanthanides	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb
Actinides	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No

4. Answer: d

Explanation:

Given:

$$6x^2 + 3x^2 - 5x + 1$$

Calculation:

$$6x^2 + 3x^2 - 5x + 1$$

$$\Rightarrow 9x^2 - 5x + 1$$

Let 'a' and 'b' be two roots of the equations

As we know,

$$\text{Sum of roots } (\alpha + \beta) = (-b)/a = 5/9$$

$$\text{Product of roots } (\alpha\beta) = c/a = 1/9$$

According to the question

$$\Rightarrow 1/\alpha + 1/\beta$$

$$\Rightarrow (\alpha + \beta)/\alpha\beta$$

$$\Rightarrow [5/9] / [1/9] = 5$$

5. Answer: c

Explanation:

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

The pattern followed here is:

The positional value of O is 15.

The positional value of C is 3.

The positional value of G is 7.

The positional value of N is $14 \neq 15$.

Hence, D is the correct answer.

6. Answer: d

Explanation:

- The Valency of an element is defined as the capability to gain or lose its valence electrons in order to complete its valence shell.
- Cuprous oxide or Cu_2O is one of the principle oxides of copper.
- Its valency is 1.

7. Answer: a

Explanation:

Given:

Total number of marbles = 315

Ratio in which marbles are shared = 7 : 3 : 5

Calculation:

Let marbles distributed among Aman, Ashok and Alok be $7x : 3x : 5x$

According to the question,

$$7x + 3x + 5x = 315$$

$$\Rightarrow 15x = 315$$

$$\Rightarrow x = 21$$

So,

Aman has marbles = $7 \times 21 = 147$

Ashok has marbles = $3 \times 21 = 63$

Aman gets more marbles than Ashok by = $147 - 63$

$\Rightarrow 84$

$\therefore$ 84 more marbles did Aman get compared to Ashok.

8. Answer: d

Explanation:

- Carbonyl group is an organic functional group composed of a carbon double atom double bonded to an oxygen atom.
- Aldehyde, Carboxyl Acid and Ketone contain Carbonyl group.
- Ethanol belongs to the Alcohol group.

9. Answer: d

Explanation:

Given:

Efficiency of two inlet pipes = 2:1

The two can fill the empty cistern in 12 hours.

A drain pipe can empty a cistern all by itself in 12 hours.

Concept used:

Work done = efficiency $\times$ time

Calculation:

Efficiency of two inlet pipes = 2:1

We know that,

Work done = efficiency $\times$ time

$$\Rightarrow (2 + 1) \times 12 = 36$$

The more efficient inlet pipe take to fill the empty cistern by itself = $36/2$

$$\Rightarrow 18$$

$\therefore$ The Required answer is 18

★ Alternate Method

Let the two inlet pipes be A and B.

Let the total work be 36 units and the efficiency of A and B be $2x$ and x .

$\therefore$ The two can fill the empty cistern in 12 hours,

$$\therefore 36/(2x + x) = 12$$

$$\Rightarrow x = 1$$

$$\Rightarrow \text{Time taken by more efficient pipe A} = 36/2x = 36/2 = 18 \text{ hours}$$

★ Confusion Points

A drain pipe can empty a cistern all by itself in 12 hours. It is given for only distract the Question. Don't confuse with irrelevant terms use in the question.

10. Answer: d**Explanation:**

- The Battle of Plassey was fought on 23 rd June 1757.

- The battle was fought between East India Company and the Nawab of Bengal.
 - The English won the battle and proved to be the decisive battle for the English in India.
-

11. Answer: a

Explanation:

An ecologist studies the relationship between the biotic and abiotic components of environment and its impact (both positive and negative) on the ecological balance.

Now, the ecologist says that the impact of plastic will be visible in 10 years.

Therefore, it is safe to assume that he is talking about the impact of plastic on the environment.

Hence, assumption II is implicit.

There is nothing mentioned or hinted in the statement about the degradability of plastic.

Hence, assumption I is not implicit.

Thus, only assumption II is implicit.

12. Answer: d

Explanation:

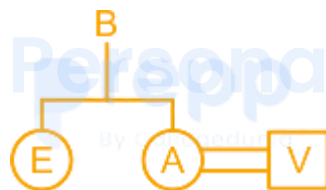
- The Point at which all the rays converge is termed as Focus.
 - The straight line that goes through the center of the lens at right angles to the lens surface is called principle axis.
 - Pole is the mid point of the Lens.
-

13. Answer: c

Explanation:

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

Using the above symbols, we get the following family tree:



Hence, V is the brother-in-law of E.

14. Answer: b

Explanation:

The symbols in each square move to the next square in clockwise direction.

The triangle is rotating in anticlockwise direction.

The slash symbols alternately turn forward or backward.

The number of ($\pm$) symbols alternately increases or decreases by one.

The symbol (Ω) alternately flips horizontally.



Hence, the figure in option D is the correct answer.

15. Answer: a

Explanation:

$$\Rightarrow 4x^2 + kx + 5 \text{ is divisible by } (x + 1)$$

Now we can say $x = (-1)$

$$\Rightarrow 4(-1)^2 + k(-1) + 5 = 0$$

$$\Rightarrow 4 - k + 5 = 0$$

$$\Rightarrow k = 9$$

$$\Rightarrow 4x^2 + 9x + 5 = 0$$

$$\Rightarrow 4x^2 + 5x + 4x + 5 = 0$$

$$\Rightarrow x(4x + 5) + 1(4x + 5) = 0$$

$$\Rightarrow (4x + 5)(x + 1) = 0$$

Now, we can say $4x^2 + kx + 5$ is also divisible by $(4x + 5)$.

16. Answer: a

Explanation:

As we know,

Efficiency is inversely proportional to time

Efficiency ratio of Garima and (Garima's sister + Garima) = $45 : 81 = 5 : 9$

Efficiency of Garima's sister + Garima = 9

Efficiency of Garima's sister = $9 - 5 = 4$

Total work = $45 \times 9 = 405$

Let the work be completed in x days

According to the question

$$\Rightarrow 5x + 4(x - 9) = 405$$

$$\Rightarrow 9x - 36 = 405$$

$$\Rightarrow x = 49 \text{ days}$$

17. Answer: b

Explanation:

- **Chlorine** has the highest electron affinity from the elements listed above and also from all the elements in the periodic table
- The electron affinity of an element is defined as the ease with which it can accept an electron
- The correct order is Chlorine > Fluorine > Sodium > Helium
- Electron affinity is defined as the change in energy (in kJ/mole) :
 - Fluorine (F) -328 kJ mol^{-1}

- Chlorine (Cl) -349 kJ mol^{-1}
- Bromine (Br) -324 kJ mol^{-1}
- Iodine (I) -295 kJ mol^{-1}

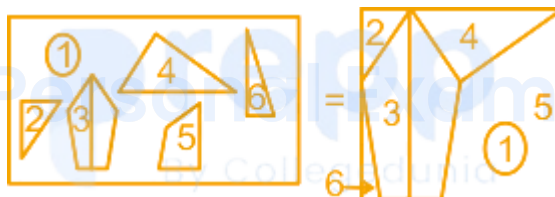
★ Additional Information

Name	Symbol	Atomic Number
Sodium	Na	11
Helium	He	2
Chlorine	Cl	17
Fluorine	F	9

18. Answer: c

Explanation:

The shapes from the problem figure can be used to create the below figure:



Hence, the figure in option B is the correct answer.

19. Answer: d

Explanation:

- Raja Todar Mal was the Finance Minister of the Mughal empire during Akbar's reign.

- Birbal was the advisor and the supreme commander of the army in the reign of Akbar.
- **Raja man Singh** was the general of the army.
- **Tansen** was a musician of in the Akbar's court.

20. Answer: c

Explanation:

The two colours mentioned in this question are blue and white. Let us assume the third colour to be black.

- Statement 1: Nayan has 2 white caps

Given: Nayan has 4 caps of 3 "different" colours.

Thus, we have the following combination:

- Case 1) 2 white caps and 1 blue cap

White - 2 Blue - 1 Black - 1

- Case 2) 2 white caps and 2 blue caps.

White - 2 Blue - 2 Black - 0

This is not possible as 4 caps should have 3 different colours.

- Case 3) 2 white caps and 2 black caps

White - 2 Blue - 0 Black - 2

- This is not possible as 4 caps should have 3 different colours.
- Thus, we can eliminate cases 2 and 3.
- Therefore, **Nayan has 1 blue cap.**
- **Hence, statement 1 alone is sufficient to answer the question.**

- Statement 2: The number of blue caps he has is the same as that of white caps.
- Case 1) 1 white cap and 1 blue cap

This will imply that the remaining 2 caps are black



- Case 2) 2 white caps and 2 blue caps.
- This case is not possible because there should be 3 different colours.
- Therefore, ***Nayan has 1 blue cap. Hence, statement 1 alone is sufficient to answer the question.***

Hence, statement 1 or 2 alone is sufficient to answer the question.

21. Answer: a

Explanation:

The most likely situation in which Naina would ask for a pen from Mahi or anyone else would be when it is not available with him/her. Hence, conclusion I follows.

The sole purpose of borrowing a pen would be to write and hence, conclusion II follows.

Thus, both the conclusions follow.

22. Answer: c

Explanation:

- **Niryat Mitra** is the mobile application launched by the Ministry of Commerce and Industry to aid exporters and importers in the country.

- This application was developed by the federation of Indian export organisation (FIEO).
- It provides wide range of information required to undertake international trade.

23. Answer: d

Explanation:

Let one year ago age of Akash's father be $9x$ and age of Akash be x .

According to the question

$$\Rightarrow (9x + 4) / (x + 4) = 5/1$$

$$\Rightarrow 9x + 4 = 5x + 20$$

$$\Rightarrow x = 4$$

$\therefore$ Age of Akash one year ago = 4 years

Present age of Akash = $4 + 1 = 5$ years

$\therefore$ Age of Akash next year = $5 + 1 = 6$ years

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Alternate Method

Let the present age of Akash be x .

Let the present age of Akash father be y .

For 1 year ago

$$\Rightarrow y - 1 = 9(x - 1)$$

$$\Rightarrow y = 9x - 8$$

For after 3 years

$$\Rightarrow y + 3 = 5(x + 3)$$

$$\Rightarrow 9x - 8 + 3 = 5x + 15$$

$$\Rightarrow 4x = 20$$

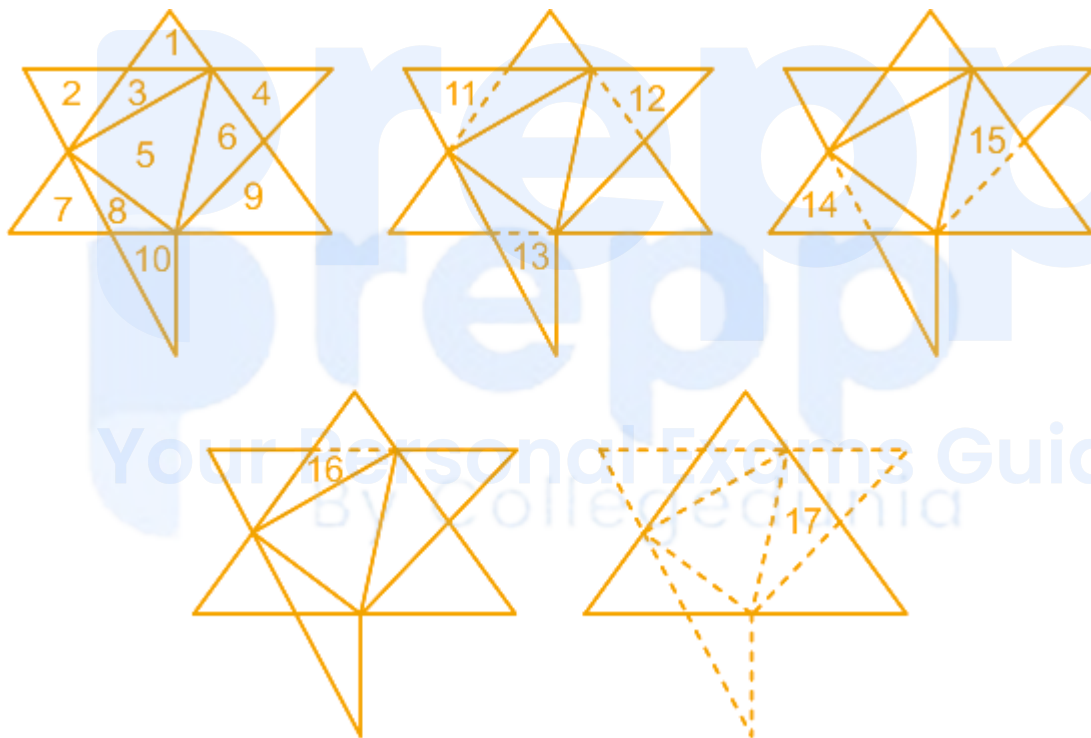
$$\Rightarrow x = 5$$

Age of Akash next year = $5 + 1 = 6$ years

$\therefore$ The age of Akash next year is 6 years.

24. Answer: d

Explanation:



Hence, there are 17 triangles in the figure.

25. Answer: c

Explanation:

- Somatic Mutation is not hereditary.
- Somatic Mutation is defined as the alteration in DNA that occurs after conception.
- It can occur in any of the cell body except the germ cells and therefore is not hereditary.

26. Answer: a

Explanation:

$$\Rightarrow \sqrt{1250} = 35.35$$

$$\Rightarrow \sqrt{16641} = \sqrt{(129 \times 129)} = 129$$

$$\Rightarrow \sqrt{2025} = \sqrt{(45 \times 45)} = 45$$

$$\Rightarrow \sqrt{9801} = \sqrt{(99 \times 99)} = 99$$

Now, we can say 1250 is not a perfect square.

27. Answer: b

Explanation:

If the triangle in the first figure is rotated 90° in the anticlockwise direction, we obtain the third figure.

Similarly, if the triangle in the second figure is rotated 90° in the anticlockwise direction, we obtain the fourth figure.

A	B	C	D

Hence, the figure in **option C** is the correct answer.

28. Answer: d

Explanation:

- Srishti Kaur had been crowned Miss Teen Universe 2017.
 - The Event was held at Managua, the capital of Nicaragua.
-

29. Answer: b

Explanation:

- Voluntary muscles are those muscles which can be controlled by the mind.
 - Hind limb contains voluntary muscles.
 - Heart, Lungs and Liver contain Involuntary muscles hence the functions of these organs can not be controlled by the Mind.
-

30. Answer: c

Explanation:

The pattern followed here is:

1224364860: 12 24 36 48 60 → First five multiples of 12

1122334455: 11 22 33 44 55 → First five multiples of 11

1020304050: 10 20 30 40 50 → First five multiples of 10

Similarly,

918273645: 9 18 27 36 45 → First five multiples of 9

Hence, 918273645 is the correct answer.

31. Answer: b

Explanation:

- Gobar-Dhan Yojana, is the central scheme for managing and converting cattle dung into manure and biogas.
 - The scheme WAS launched at the national level from Karnal in Haryana on April 30.
 - Under this scheme, one village in every district of the country would be selected for its implementation.
-

32. Answer: b

Explanation:

The statement by the coach requires the hockey team to report for practice by 9:00 am in instead of 8: 00 which is pointing towards a change in the usual schedule of the team.

Therefore, it is safe to assume that they usually assemble for practice.

Hence, assumption II is implicit.

However, the information in the coach's statement is not sufficient to determine the reasons behind the change in schedule.

Hence, assumption I is not implicit.

Thus, only assumption II is implicit.

33. Answer: d

Explanation:

The correct answer is Option 4 i.e. Gymnosperms

- The word "gymnosperm" means "**naked seed**" and the seeds are not enclosed inside the fruit but are instead exposed or on the scales of cones, like a pine cone.
- Gymnosperms belong to the kingdom '**Plantae**'.
- The gymnosperms consist of conifers, cycads, gnetophytes, and the species of **Gymnophyta** division and **Ginkgo biloba**.
- **The characteristics of Gymnosperms:**
 - They do not produce flowers.
 - Seeds are not formed inside a fruit.
 - They are not differentiated into an ovary, style, and stigma.
 - Since stigma is not present, they are pollinated directly by the wind.
- **Examples of Gymnosperms:**
 - Cycas
 - Pinus
 - Cedrus
 - Picea
 - Juniperus

34. Answer: b

Explanation:

The pattern followed here is:

$$31 + 7 = 38$$

$$38 + 6 = 44$$

$$44 + 7 = 51$$

$$51 + 6 = \mathbf{57}$$

Hence, 57 is the correct answer.

35. Answer: b

Explanation:

Given:

A square and a regular hexagon have the same perimeter.

Formula used:

$$\text{Area of square} = (\text{side})^2$$

$$\text{The perimeter of the square} = 4 \times \text{side}$$

$$\text{Area of the hexagon} = 6 \times \left[\frac{\sqrt{3}}{4}\right] \times a^2$$

Calculation:

Let the perimeter of the hexagon and the square be 12 cm.

$$\Rightarrow \text{Side of the square} = 12/4 = 3 \text{ cm}$$

$$\therefore \text{Area of the square} = 3 \times 3 = 9 \text{ cm}^2$$

$$\Rightarrow \text{Side of the hexagon} = 12/6 = 2 \text{ cm}$$

$$\Rightarrow \text{Area of the hexagon} = 6 \times \left[\frac{\sqrt{3}}{4}\right] \times a^2 = 6 \times \left[\frac{\sqrt{3}}{4}\right] \times 2 \times 2 = 6\sqrt{3}$$

$$\therefore \text{Required ratio} = 9 : 6\sqrt{3} = \sqrt{3} : 2$$

Alternate Method:

Let the perimeter of square and hexagon be x cm

$$\text{Side of square} = x/4$$

$$\Rightarrow \text{Area of square} = (x/4)^2$$

$$\Rightarrow x^2/16 \text{ cm}^2$$

Side of hexagon = $x/6$

Area fo hexagon = $6 \times [\sqrt{3}/4] \times \text{side}^2$

Area fo hexagon = $6 \times [\sqrt{3}/4] \times (x/6)^2$

$\Rightarrow \sqrt{3}x^2/24$

Required ratio = $(x^2/16) : (\sqrt{3}x^2/24)$

$\therefore$ The ratio of the area of a square to the area of a regular hexagon is $\sqrt{3} : 2$

36. Answer: b

Explanation:

Follow BODMAS rule to solve this question, as per the order given below:

Step-1: Parts of an equation enclosed in 'Brackets' must be solved first, and in the bracket,

Step-2: Any mathematical 'Of' or 'Exponent' must be solved next,

Step-3: Next, the parts of the equation that contain 'Division' and 'Multiplication' are calculated,

Step-4: Last but not least, the parts of the equation that contain 'Addition' and 'Subtraction' should be calculated.

$$\Rightarrow \frac{3}{12} \text{ of } \left(\frac{\frac{2}{5} + \frac{4}{15}}{\frac{3}{5} - \frac{2}{5}} \right) = \frac{3}{12} \text{ of } \frac{\frac{10}{15}}{\frac{1}{5}}$$

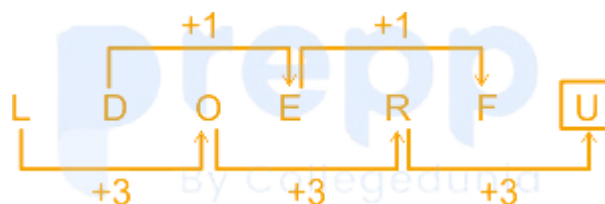
$$\Rightarrow \frac{3}{12} \times \frac{10}{15} \times \frac{5}{1} = \frac{5}{6}$$

$\therefore$ The required answer is $5/6$

37. Answer: c

Explanation:

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



Hence, U is the correct answer.

38. Answer: d

Explanation:

- The electoral college who elects the President of India is formed by the Elected members of the Parliament and the State Legislative Assemblies.
- The Constitution provides for the election of the President by the system of proportional representation by means of the single transferable vote.

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39. Answer: c

Explanation:

- An element of atomic number 16 will belong to the 3rd period of the periodic table.
- Periods are the horizontal rows across the periodic table.
- Groups are the vertical columns across the periodic table.

40. Answer: d

Explanation:

CONCEPT:

- Heating effect of electric current: When a current is flowing in a circuit having resistance there is heat dissipation due to the resistance. This is called the heating effect of electric current.

The heat dissipated is given by:

$$\text{Heat (H)} = I^2 R t$$

$$\text{Work done (W)} = \text{Heat (H)} = \text{Energy consumed (E)} = \text{Power (P)} \times \text{Time taken (t)}$$

Where I = the current flowing in the circuit, R = the resistance of the circuit, and t = the time taken

CALCULATION:

Given,

Power = 100 W, Time = 8 hours per day

We know that,

$$\text{Power (P)} = \text{Energy (E)} / \text{Time (t)}$$

$$\text{Power} = 100 \text{ W} = 0.1 \text{ KW}$$

$$0.1 = E/8$$

$$\text{Energy (E)} = 0.8 \text{ KWh} = 0.8 \text{ Unit in one day}$$

★ Additional Information

- 1 unit of electric energy: When a one-kilowatt load works for 1 hour then the energy consumed is called 1 unit of electricity.

$$1 \text{ Unit of electricity} = 1 \text{ KWh} = 1000 \text{ Watt-hour} = 3.6 \times 10^6 \text{ J}$$

$$1 \text{ Kilo-watt} = 1000 \text{ Watt}$$

1 Hp = 1 horsepower = 746 Watt (W)

41. Answer: a

Explanation:

- Captain D.K. Sharma was the spokesperson of the Indian Navy in February 2018.
 - The Current Navy Chief is Karambir Singh.
 - INS Viraat was Indian Navy's first aircraft carrier.
 - INS Vikrant is the first aircraft carrier to have been manufactured in India.
-

42. Answer: b

Explanation:

As we know, the efficiency is inversely proportional to the time

Efficiency of pipe C and D = 5 : 4

Total work = $5 \times 4 = 20$

Work done by C in three hours = $3 \times 5 = 15$

Remaining work = $20 - 15 = 5$

$\therefore$ Remaining work, D will complete in = $5/4 = 1.25$ hours

43. Answer: a

Explanation:

Follow BODMAS rule to solve this question, as per the order is given below:

Step-1: Parts of an equation enclosed in 'Brackets' must be solved first and in the bracket,

Step-2: Any mathematical 'Of' or 'Exponent' must be solved next,

Step-3: Next, the parts of the equation that contain 'Division' and 'Multiplication' are calculated,

Step-4: Last but not least, the parts of the equation that contain 'Addition' and 'Subtraction' should be calculated.

$$\{52 - (9 - 2)\} \div [3 \times \{1 + (-2) \times (-2)\}]$$

$$\Rightarrow \{52 - 7\} \div [3 \times \{1 + 4\}]$$

$$\Rightarrow 45 \div [3 \times 5]$$

$$\Rightarrow 45 \div 15$$

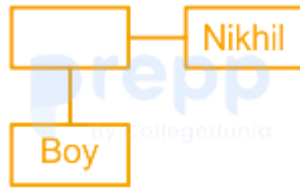
$$\Rightarrow 3$$

44. Answer: d

Explanation:

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

Using the above symbols, we get the following family tree:



Hence, Nikhil is the boy's paternal uncle.

45. Answer: a

Explanation:

- Football was officially included as a competitive game in Olympics in 1908 Games.
- The 1908 Olympics games were held in London, United Kingdom.

46. Answer: d

Explanation:

As we know,

Area of triangle whose vertices are (x_1, y_1) , (x_2, y_2) and $(x_3, y_3) = \frac{1}{2} \times [x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)]$

Area of the triangle whose vertices are A(-4, -2), B(-3, -5) and C(3, -2)

$$\Rightarrow \frac{1}{2} \times [\{(-4) \times (-3)\} + \{(-3) \times 0\} + \{3 \times 3\}]$$

$$\Rightarrow \frac{1}{2} \times [12 + 0 + 9]$$

$$\Rightarrow \left(\frac{1}{2}\right) \times 21$$

$$\Rightarrow 10.5 \text{ sq. units}$$

47. Answer: d

Explanation:

Given:

A and B can do a piece of work together = 15 days

A alone can do the work in = 25 days

B leaves 5 days before completion of the work

Concept used:

The efficiency ratio is inversely proportional to time for the same work

Work = time $\times$ efficiency

Calculation:

Efficiency ratio of (A + B) and A = 25 : 15 = 5 : 3

Efficiency of B = 5 - 3 = 2

Efficiency ratio of A to B = 3 : 2

$\Rightarrow$ Total work = 5 $\times$ 15 = 75 units

In the last 5 days, only A does the work.

$\Rightarrow$ Work done by A in the last 5 days = 5 $\times$ 3 = 15 units

$\therefore$ Remaining work = 75 - 15 = 60 units

The remaining work is done by A and B together before B left.

$\therefore$ Time taken by A and B to complete 60 units = $60/5 = 12$ days

48. Answer: b

Explanation:

- The Second Equation of Motion gives the relationship between Position and Time.

⇒ It is given by $S = ut + \frac{1}{2} at^2$

⇒ S = Displacement, u = Initial Velocity, t = Time, a = Acceleration

49. Answer: c

Explanation:

The correct answer is Current will not flow.

★ Key Points

- If two charged bodies having equal potential are connected through a conducting wire, then the Current will not flow.
 - The flow of current is defined as the rate of flow of electric charge.
 - When the electric charge flows in one direction, the current flows in the opposite direction.
 - The current only flows when there is a potential difference between two bodies.
-

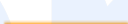
50. Answer: b

Explanation:

- Ekta Kapoor had won the ITA Sterling Icon of Indian Entertainment' Award at the 17th edition of the Indian Television Academy Awards held on November 2017.
- ITA Awards is an annual event organised by the Indian Television Academy to honour the excellence of Indian Television.

51. Answer: b

Explanation:

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

Using the above symbols, we get the following family tree:



Hence, V and N are cousins.

52. Answer: d

Explanation:



Hence, the figure in option C is the correct answer.

53. Answer: a

Explanation:

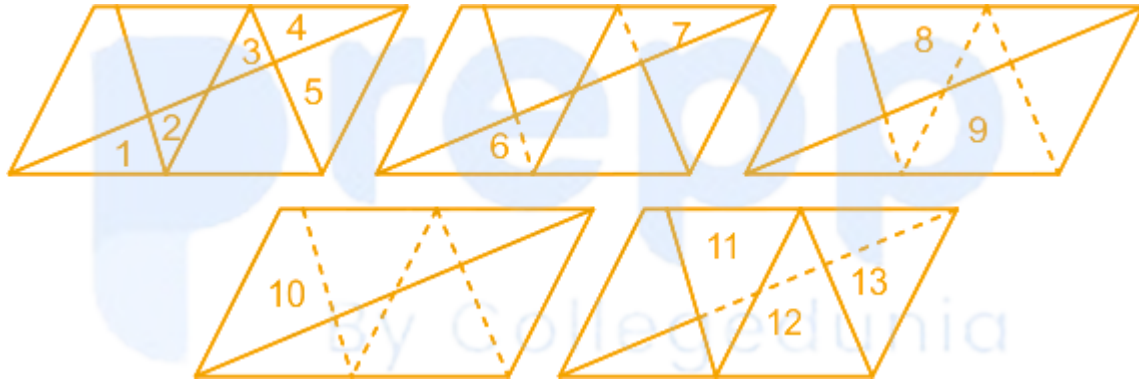
- Before 2020, Rajiv Gandhi Khel Ratna awardee got a medal, a citation and a cash prize of Rs 7.5 lakhs.

★ Important Points

- Prime Minister Narendra Modi has announced that the Rajiv Gandhi Khel Ratna Award will now be known as the Major Dhyan Chand Khel Ratna Award.
- Dhyan Chand himself has been conferred with several honours, including India's third highest civilian honour of Padma Bhushan in 1956.
- In addition to this, the Government of India also celebrates his birthday on August 29 as National Sports Day.
- The Khel Ratna award is the highest sporting honour in the nation.
- In the year 2020, The prestigious award carries prize money revised to Rs. 25 lakh.

54. Answer: b

Explanation:



Hence, there are 13 triangles in the figure.

55. Answer: a

Explanation:

- "A table, a chair, a bowl of fruit and a violin: what else does a man need to be happy?" was quoted by Albert Einstein.

A few other quotes are:

- I have no special talents. I am only passionately curious.
- Anyone who has never made a mistake has never tried anything new.
- Logic will get you from A to B. Imagination will take you everywhere.

56. Answer: c

Explanation:

- Compressions and rarefactions are due to variability of Air Pressure.
- A Compression is a region in a longitudinal wave where the particles are closest together.
- A Rarefaction is a region in a longitudinal wave where the particles are furthest apart.

57. Answer: b

Explanation:

Tarun invested Rs. 13,000 and for 12 months and Tapan invested Rs. 19,500 for 8 months.

As we know,

Profit = Capital × Time

Profit ratio of Tarun to Tapan = $(13,000 \times 12) : (19,500 \times 8) = 156000 : 156000 = 1 : 1$

58. Answer: d

Explanation:

- India is the Second most populated country in the world.
- China is the most populated country in the world.
- The current population of India is 1.3 Billion.

59. Answer: b

Explanation:

CONCEPT:

- Average velocity: The ratio of net displacement to total time taken is called average velocity .

$$\text{Average velocity } (V_{av}) = \frac{\text{Net displacement (S)}}{\text{time taken (t)}}$$

The average velocity is also given by:

$$V_{av} = (u + v) / 2$$

Where u is initial velocity and v is the final velocity of the object.

EXPLANATION:

If final Velocity v and Initial velocity u are known, then the formula for the **average velocity** is given by:

$$V_{av} = (u + v)/2.$$

So option 2 is correct.

60. **Answer: b**

Explanation:

Total sales of all quarter = $200 + 100 + 350 + 550 = 1200$

$\therefore$ Average sales = $1200/4 = 300$

61. **Answer: b**

Explanation:

Tunnel, bunker and well are structures mostly built underground whereas building is a structure built about the ground.

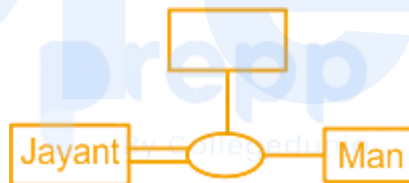
Hence, building is the odd one among the given options.

62. **Answer: a**

Explanation:

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

Using the above symbols, we get the following family tree:



Hence, the man is Jayant's brother-in-law.

63. Answer: a

Explanation:

- Each kidney consists of a large number of filtration units called Nephrons.
- Each Nephron filters a small amount of blood.

NOTE:

- Nephrons are also called the functional units of the kidney.
- Nephrons produce urine in the process of removing waste and excess substances from the blood.

64. Answer: a

Explanation:

As we know, Speed = Distance/Time

Total distance = $153 + 127 = 280$ m

Let the relative speed of both trains be x m/s.

According to the question

$$\Rightarrow x = (280/7.2) \text{ m/s}$$

$$\Rightarrow x = (280/7.2) \times (18/5) \text{ km/h}$$

$$\Rightarrow x = 140 \text{ km/hr}$$

65. Answer: b

Explanation:

- There are 23 pairs of Chromosomes i.e 46 present in somatic cells of Human beings.
- A Somatic cell is any cell of the body except sperm and egg cells.
- These cells are diploid, and each set of the chromosome is inherited from each parent.

66. Answer: a

Explanation:

Let the fraction x be added to $7/8$.

According to the question

$$\Rightarrow x + 7/8 = 4$$

$$\Rightarrow x = 4 - (7/8)$$

$$\Rightarrow x = 25/8 = 3\frac{1}{8}$$

67. Answer: c

Explanation:

$$4 + 3 \times 4 + 3 \times 4^2 + 3 \times 4^3 + 3 \times 4^4 + 3 \times 4^5$$

$$\Rightarrow 4 + 3(4 + 4^2 + 4^3 + 4^4 + 4^5)$$

$$\Rightarrow 4 + 3 \times 1364$$

$$\Rightarrow 4 + 4092$$

$$\Rightarrow 4096$$

$$\Rightarrow 4 \times 4 \times 4 \times 4 \times 4 \times 4 = 4^6$$

Alternate method :

$$4 + 3 \times 4 + 3 \times 4^2 + 3 \times 4^3 + 3 \times 4^4 + 3 \times 4^5$$

$$\Rightarrow 4(1 + 3) + 3 \times 4^2 + 3 \times 4^3 + 3 \times 4^4 + 3 \times 4^5$$

$$\Rightarrow 4^2 + 3 \times 4^2 + 3 \times 4^3 + 3 \times 4^4 + 3 \times 4^5$$

$$\Rightarrow 4^2(1 + 3) + 3 \times 4^3 + 3 \times 4^4 + 3 \times 4^5$$

$$\Rightarrow 4^3 + 3 \times 4^3 + 3 \times 4^4 + 3 \times 4^5$$

$$\Rightarrow 4^3(1 + 3) + 3 \times 4^4 + 3 \times 4^5$$

$$\Rightarrow 4^4 + 3 \times 4^4 + 3 \times 4^5$$

$$\Rightarrow 4^4(1 + 3) + 3 \times 4^5$$

$$\Rightarrow 4^5 + 3 \times 4^5$$

$$\Rightarrow 4^5(1 + 3)$$

$$\Rightarrow 4^6$$

68. Answer: b

Explanation:

- Urjit Patel served as the 24th Governor of the Reserve Bank of India.
- The RBI governor performs the task of administering the government's Policy.
- Raghu Ram Rajan was the 23rd Governor of the Reserve Bank of India.

69. Answer: a

Explanation:

Statements 1 and 3 together:

$$L > _ > _ > _ > _ > N$$

Here, the data is insufficient to answer the question.

Statements 1, 2 and 3 together:

$$L > _ > _ > _ > _ > N$$

$$J > K$$

Here, the data is insufficient to answer the question.

Statements 1, 2, 3 and 4 together:

$$J > K > O$$

Case 1:

$$L > _J_ > _K_ > _O_ > _M_ > N$$

Case 2:

$$L > _M_ > _J_ > _K_ > _O_ > N$$

Now, this data is also insufficient as we are unable to determine the position of M.

Hence, all the statements are insufficient to answer the question.

70. Answer: a

Explanation:

Calculations:

$$\Rightarrow \sqrt[4]{32} = \sqrt[4]{(2 \times 2 \times 2 \times 2 \times 2)} = 2\sqrt{2}$$

$$\Rightarrow \sqrt[3]{64} = \sqrt[3]{(4 \times 4 \times 4)} = 4$$

$$\Rightarrow \sqrt[5]{32} = \sqrt[5]{2 \times 2 \times 2 \times 2 \times 2} = 2$$

$$\Rightarrow \sqrt[3]{27} = \sqrt[3]{(3 \times 3 \times 3)} = 3$$

Therefore, $\sqrt[4]{32}$ is not a rational number.

71. Answer: c

Explanation:

- Germanium (Ge) is a semiconductor.
- Semiconductors are those elements which have their electrical conductivity lying between the range of Conductors and Insulators.

- Gallium, Lead and Tin are all metals.
-

72. Answer: c

Explanation:

If $3x^2 + ax + 4$ is perfectly divisible by $x - 8$, then $x = 8$

Put $x = 8$

$$\Rightarrow 3x^2 + ax + 4 = 0$$

$$\Rightarrow 3 \times 8^2 + a \times 8 + 4 = 0$$

$$\Rightarrow 3 \times 64 + 8a + 4 = 0$$

$$\Rightarrow 8a = (-196)$$

$$\Rightarrow a = (-24.5)$$

73. Answer: b

Explanation:

Nakul's age = 12 years

Dwij's age = $12 - 3 = 9$ years

Total age of Nakul and Dwij = $12 + 9 = 21$

$\therefore$ Statements 1 and 2 together are sufficient to solve the question.

74. Answer: d

Explanation:

Poetry, sonnet and rhyme are words related to poem whereas diagram is a drawing.

Hence, diagram does not belong to this group.

75. Answer: a

Explanation:

Spades and Hearts are 2 types of playing cards.

The least possible Venn diagram is:



Hence, the figure in option 1 is the correct answer.

76. Answer: c

Explanation:

- Chlorine is the most electro negative element of all the available elements.
- Electro negativity is chemical property that describes the tendency of an atom to attract a shared pair of electrons toward it self.
- Chlorine has 7 Electrons in its outer most shell, hence its valency is 1.
- This tends to make it one of the most electro negative elements in the periodic table.
- Aluminium and Phosphorus are metals and hence not electro negative in nature.
- Sulphur is a Non metal but less electro negative than Chlorine.
- Fluorine is the most electro negative element in the Modern periodic table.

77. Answer: d

Explanation:

Short trick :

$$\text{Required price} = 3540 / 0.59 \times 1.11 - 3540 = 6660 - 3540 = \text{Rs. } 3120$$

Detailed solution :

SP of the tea-set = Rs. 3540

Let the cost price of the tea-set be Rs. x

According to the question

$$\Rightarrow x \times (100 - 41) / 100 = 3540$$

$$\Rightarrow x = 3540 \times (100 / 59) = \text{Rs. } 6000$$

To make 11% profit seller should have sold the set for = Rs. $6000 \times (111/100) = \text{Rs. } 6660$

The seller should have sold the set more by = Rs. $(6660 - 3540) = \text{Rs. } 3120$

78. Answer: c

Explanation:

- The Official currency of Europe is Euro.
- Yen is the official currency of Japan.
- Dollar is the official currency of USA.
- Pound is the official currency of United Kingdom.

79. Answer: b

Explanation:

Given:

We have to find the number of factors of 512 which are whole squares.

Calculations:

Factors of 512 are 1, 2, 4, 8, 16, 32, 64, 128, 256 and 512.

$\therefore$ We can say 1, 4, 16, 64 and 256 are perfect square.

80. Answer: b

Explanation:

- India celebrates its constitutional day on 26th November.
- This date is also remembered as the date of Poorna Swaraj resolution.
- The Poorna Swaraj resolution was passed by the INC as the Lahore Session 1929.

81. Answer: d

Explanation:

$$\text{Potential Energy} = M \times g \times H$$

$$400 \text{ J} = 20 \times 10 \times H$$

$$H = 400/200$$

$$H = 2 \text{ Meters}$$

82. Answer: d

Explanation:

- B Sai Praneeth is associated with Badminton.
 - Other famous Badminton players are Saina Nehwal, PV Sindhu, K Shrikanth.
 - Famous Cricket players are MS Dhoni, Virat Kohli.
 - Famous Kho-Kho players are Satish Rai, Veena Narayan.
 - Famous Taekwondo players are Anita Pal, Sagnik Sen.
-

83. Answer: b

Explanation:

- Udipi Ramachandra Rao was a space scientist who also served as Chairman of ISRO.
 - The Government of India has awarded him Padma Vibhushan in 2017 for his achievements in the field of Science and Technology.
-

84. Answer: d

Explanation:

- Tonk, Nagaur and Sikar are districts in Rajasthan.
 - Navsari district is in Gujarat.
 - Other major cities in Gujarat are Ahmedabad, Gandhinagar, Surat.
-

85. Answer: b

Explanation:

- CCl_4 or Tetrachloromethane is not acidic in nature.
- It is a clear, colorless, volatile and stable Chlorinated Hydrocarbon.

- It is used as a refrigerant and as a solvent for oils and fats.

86. Answer: a

Explanation:

Short trick:

Let the cost price of the item that was sold at 15% loss be Rs. 100.

⇒ The selling price of the item that was sold at 15% loss is Rs. 85.

∴ The cost price of the item that was sold at 25% profit be Rs. 200.

⇒ The selling price of the item that was sold at 25% profit be Rs. 250.

Total selling price = $85 + 250 = \text{Rs. } 335$

Total cost price = $100 + 200 = \text{Rs. } 300$

Profit = $335 - 300 = \text{Rs. } 35$

∴ These prices satisfy the given condition for the profit,

∴ The required cost price = $100 + 200 = \text{Rs. } 300$

Detailed solution:

Let there are two item A and B.

Let the cost of A be Rs. $4x$ and cost of B be Rs. $20y$ [$\because 25\% = 1/4$ and $15\% = 3/20$]

⇒ SP of A = $4x \times (5/4) = 5x$

⇒ SP of B = $20y \times (17/20) = 17y$

Ratio of CP to SP of article A = $4 : 5$ ----- (1)

Ratio of CP to SP of article B = $20 : 17$ ----- (2)

Multiply by 10 in equation (1)

New ratio of CP to SP of article A = 40 : 50 ----- (3)

According to the question

Total CP of article A and B = (20 + 40 = 60) unit

Total SP of article A and B = (17 + 50 = 67) unit

⇒ Profit = 67 – 60 = 7 unit

⇒ 7 unit = 35

⇒ 1 unit = 5

Sum of CP of article A and B = (40 + 20) × 5 = 60 × 5 = Rs. 300

87. Answer: a

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 pattern followed here is:

22 + 20 = 42; 42 + 20 = 62; 62 + 20 = **82**

A + 4 → E; E + 4 → I; I + 4 → **M**

Hence, '82 M' is the correct answer.

88. Answer: b

Explanation:

As we know,

Average speed = Total Distance/Total time

$$\Rightarrow \text{Total Time} = 15 + 16 = 31$$

$$\Rightarrow \text{Total time} = 4 + 3 = 7$$

$$\text{Average speed} = 31/7 = 4.43 \text{ ms}^{-1}$$

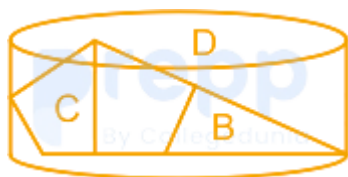
89. Answer: c

Explanation:

- The Law of definite proportions states that a compound will always contain the same proportion of elements by mass.
- It was given by Proust.
- Lavoisier discovered the role of oxygen in combustion.
- Democritus was a Greek Mathematician.
- Dalton gave the atomic theory which states that the atom of different size varies in size and mass.

90. Answer: b

Explanation:



Hence, 'B, C and D' is the correct answer.

91. Answer: d

Explanation:

- Human Development Index is a statistical tool used to measure a country's overall achievement in its social and economic dimensions.
- It was developed by Pakistani economist Mahbub-ul-Haq and Indian economist Amartya Sen.
- Every year United Nation Development Program (UNDP) ranks countries based on the HDI report.

92. 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 pattern followed here is:

The positional value of P is 16.

The positional value of I is 9.

The positional value of G is 7.

Thus, PIG is coded as 1697.

Now,

The positional value of G is 7.

The positional value of O is 15.

The positional value of A is 1.

The positional value of T is 20.

Hence, GOAT is coded as 715120.

93. Answer: d

Explanation:

Let the number be x multiplied to $6\frac{2}{9}$ to get 40.

According to the question

$$\Rightarrow x \times 6\frac{2}{9} = 40$$

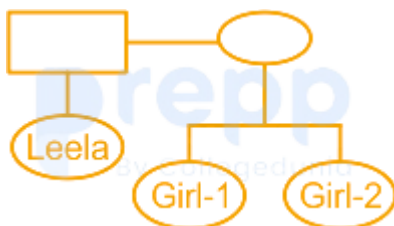
$$\Rightarrow x \times (56/9) = 40$$

$$\Rightarrow x = 40 \times (9/56)$$

$$\Rightarrow x = 6\frac{3}{7}$$

94. Answer: a

Explanation:

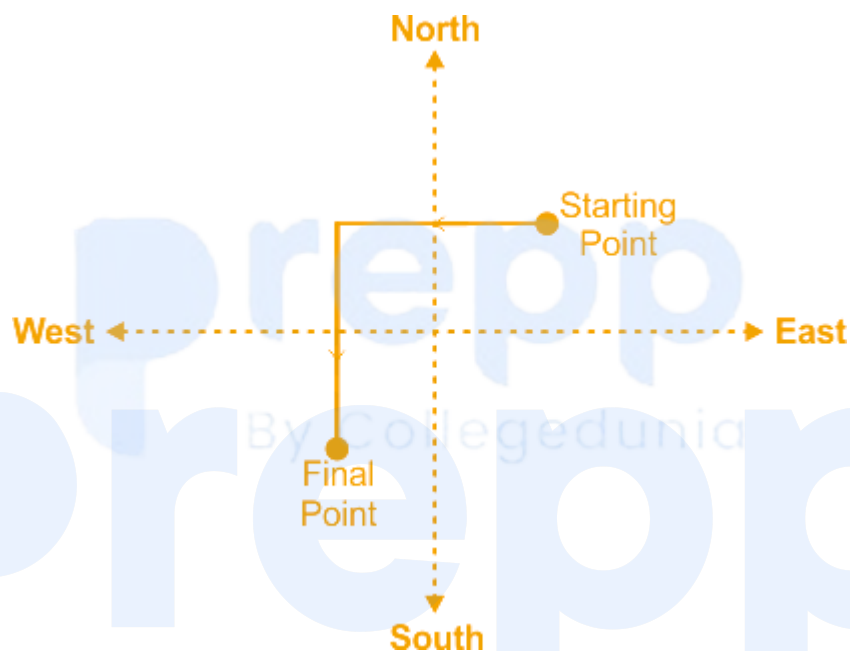


Hence, Leela and the girls are cousins.

95. Answer: c

Explanation:

To face south after turning left, Murali must walking towards the west direction.



Hence, west is the correct answer.

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96. Answer: c

Explanation:

- **pH value** is defined as the measure of the concentration of hydrogen ion in a solution.
- The pH scale ranges from 0 to 14.
- If the pH value of a solution **less than 7** then it is termed as **Acidic**.
- An acidic solution turns blue litmus red.
- If the pH value of a solution **more than 7** then it is termed as **Basic**.
- An basic solution turns red litmus blue.

97. Answer: b

Explanation:

Formula Used :

- $\sigma^2 = \sum (x_i - \bar{x})^2 / n$
- Standard deviation is same when each element is increased by the same constant

Calculation:

Since each data increases by 10,

There will be no change in standard deviation because $(x_i - \bar{x})$ remains same.

∴ The standard deviation of 10, 11, 12, 13 _____ 19 will be will be K.

★ Alternate Method

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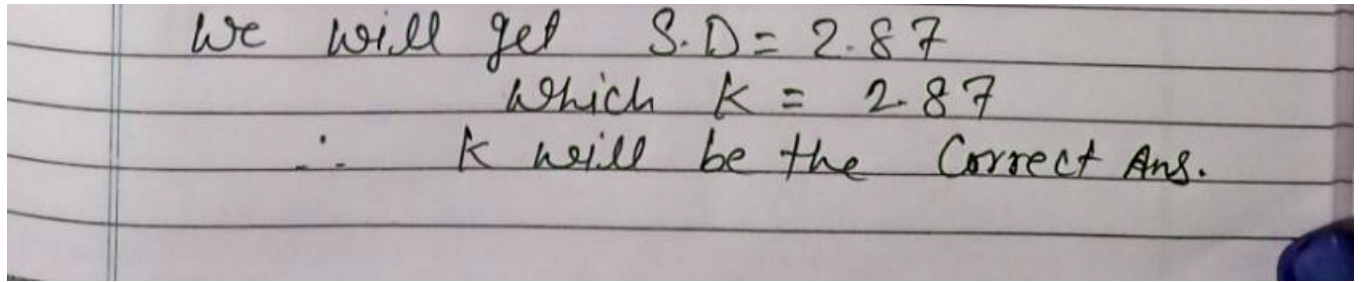
x_i	$x_i - \bar{x}$	$(x_i - \bar{x})^2$
0	-4.5	20.25
1	-3.5	12.25
2	-2.5	6.25
3	-1.5	2.25
4	-0.5	0.25
5	0.5	0.25
6	1.5	2.25
7	2.5	6.25
8	3.5	12.25
9	4.5	20.25
$\sum x_i = 45$		$\sum (x_i - \bar{x})^2 = 82.5$

$$\bar{x} = \frac{\sum x_i}{N} = \frac{45}{10} = 4.5$$

$$\begin{aligned} \text{Var. Standard deviation} &= \sqrt{\frac{\sum (x_i - \bar{x})^2}{N}} \\ &= \sqrt{\frac{82.5}{10}} = \sqrt{8.25} \approx 2.87 \end{aligned}$$

$$\therefore K \approx 2.87$$

In the ~~same~~ way we can find standard dev of 10, 11, 12 ... 19.



98. Answer: b

Explanation:

- Lt. General Anil Chauhan took charge as the new Director General of Military Operations (DGMO) of Indian Army in 2018.
- He observed various operations of the Indian Army including along the LoC in Jammu and Kashmir.
- Lt. General Paramjit Singh has taken charge as the new Director General of Military Operations in 2019.

99. Answer: c

Explanation:

Increase in mobile usage and cell phone towers indicates that many people can afford to purchase the device, thereby showing global development. Also, the purpose of using mobiles and cell phone towers is to facilitate fast and easy connectivity.

Hence, argument I is strong.

However, the information given in the statement is not sufficient to determine the impact of the usage of mobiles and cell phone towers on the functioning of the ecological systems.

Hence, argument II is not strong.

Thus, only argument I is strong.

100. **Answer: d**

Explanation:

Radius of steel sphere $R = 6$ cm

Radius of small balls $r = 1$ cm

As we know,

Volume of sphere $= \left(\frac{4}{3}\right) \times \pi r^3$

Let n balls each of radius 1 cm be made from steel sphere

According to the question

$$\Rightarrow \left(\frac{4}{3}\right) \times \pi R^3 = n \times \left(\frac{4}{3}\right) \times \pi r^3$$

$$\Rightarrow 6 \times 6 \times 6 = n \times 1 \times 1 \times 1$$

$$\Rightarrow n = 216$$

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