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- RBI GRADE B
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- DSSSB

RRB Group D 2018 Previous Year Paper (02-Nov-2018) (Shift 2)

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

Instructions

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

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

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

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

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CBT

1. _____ gas was not present in its free state at the time when life arose on Earth. **(+1, -0.33)**

   a. Oxygen

   b. Methane

   c. Ammonia

   d. Hydrogen

---

2. The sound wave travels on the following. **(+1, -0.33)**

   a. different speed in different mediums

   b. same speed in different mediums

   c. 10 m/s in wood

   d. different speed in the same medium

---

3. _____ gas is evolved when zinc reacts with hydrochloric acid. **(+1, -0.33)**

   a. Hydrogen

   b. Hydrogen Chloride

   c. Chlorine

   d. Oxygen

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4. The movie "The Man Who Knew Infinity", released in the year 2016, is based on the biography of which famous personality? **(+1, -0.33)**

   a. Srinivasa Ramanujan

   b. M.S. Swaminathan

   c. C.V. Raman

   d. A. P. J. Abdul Kalam

---

5. The statement given below is followed by two arguments. You have to decide which argument(s) is/are strong. **(+1, -0.33)**

   Statements:

   Food rich in protein is better than junk food.

   Arguments:

   I. Yes, food rich in protein is good for the mental and physical development of children.

   II. No, junk food is tastier than food rich in protein.

   a. Only argument I is strong.

   b. Neither I Nor is II is strong.

   c. Only argument II is strong.

   d. Both arguments I and II are strong.

---

6. Identify the person who does not belong to the group. **(+1, -0.33)**

   a. Pentala Harikrishna

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b. Koneru Humpy

c. Saina Nehwal

d. Viswanathan Anand

---

7. What will be the minimum energy required to launch a satellite of m kg from the surface of the earth into a circular orbit at a height of 2R? The radius of the earth is R. **(+1, -0.33)**

a. 2 mgR

b. 3 mgR

c. 1/2 mgR

d. 5/6 mgR

---

8. Mendel chose pea plants because _____. **(+1, -0.33)**

a. All of the above options

b. They were cheap.

c. They were readily available.

d. He had odd looking qualities.

---

9. Find the value of $\frac{\sqrt{0.64}}{\sqrt{0.16}}$. **(+1, -0.33)**

a. 2

b. 8

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c. 6

d. 10

---

10. What is the minimum age limit to be eligible for an appointment as the Prime Minister of India? **(+1, -0.33)**

a. 35 years

b. 25 years

c. 30 years

d. 45 years

---

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

a. If the buoyant force is less than the weight of the object, then the object sinks.

b. If the buoyant force is greater than the weight of the object, then the object floats.

c. If the buoyant force is less than the weight of the object, then the object floats.

d. If the buoyant force is equal to the weight of the object, then the object floats inside the liquid.

---

12. What will be the mean of the numbers 4, 1, 1, 6, 2 and 7? **(+1, -0.33)**

a. 3.5

b. 2

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c. 2.5

d. 3

---

13. Find the geometric mean of the numbers 7, 7^2, 7^3, _____ 7^n. **(+1, -0.33)**

a. $7^{\frac{n+1}{2}}$

b. $7^{\frac{n-1}{2}}$

c. $7^{\frac{n}{2}}$

d. $7^{\frac{n}{7}}$

---

14. Determine the integer n so that n/60 should be less than or equal to $\frac{1}{5}$ but greater than $\frac{1}{6}$. **(+1, -0.33)**

a. 11

b. 10

c. 12

d. Both option 1 and 3

---

15. The Act to replace the archaic 'Monopoly and Restricted Trade Practices Act, 1969' is _____. **(+1, -0.33)**

a. Goods and Services Tax (GST)

b. Business freedom act

c. Prohibited Trade Practices Act

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d. Competition act

---

16. In a city, each year, the number of people in the population at the beginning of the year increased by 3%. If the present population of that city is 30,00,000, then the population after 3 years will be. **(+1, -0.33)**

a. 3277181

b. 3217881

c. 3278181

d. 3281781

---

17. Considering the statement, it is to be decided which of these assumption(s) is/are implicit in the statement. **(+1, -0.33)**

Statements:

If you are a software engineer, we have a challenging project for you.

Assumptions:

I. You are a software engineer.

II. We need a software engineer.

a. Only Assumption II is implicit.

b. Only assumption I is implicit.

c. Either Assumption I or II is implicit.

d. Neither assumption I nor assumption II is implicit.

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18. What is the temperature at which a liquid begins to boil at atmospheric pressure? **(+1, -0.33)**

a. Heat of fusion

b. Heat of neutralisation

c. Boiling point

d. Melting point

---

19. X attempted 98 questions and got 202 marks. If there is 4 marks for each correct answer and one negative mark for each wrong answer, then the number of correct questions answered by Mr X is _____. **(+1, -0.33)**

a. 58

b. 40

c. 38

d. 60

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---

20. Justice Jagdish Singh Khehar was appointed as the _____ Chief Justice of India in January 2017. **(+1, -0.33)**

a. 43rd

b. 44th

c. 40th

d. 45th

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21. The molar mass of ethene (C 2 H 2) is **(+1, -0.33)**

a. 25u

b. 28u

c. 30u

d. 26u

---

22. If the angles of a triangle are in the ratio 5 : 6 : 7 then the triangle is said to be **(+1, -0.33)**

a. equilateral triangle

b. acute triangle

c. right angled triangle

d. obtuse triangle

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23. Select the option which is related to the third word in the same way that the second word is related to the first word. **(+1, -0.33)**

Prose : Poetry :: Conversation : _ _ _ _ _ _ _ _

a. Poem

b. Listening

c. Debate

d. Language

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24. Where is the 'Shri Shiv Chhatrapati Sports Complex' (also known as Balewadi Stadium) located? **(+1, -0.33)**

a. Nashik

b. Bhubaneswar

c. Pune

d. Ahmedabad

---

25. What are the coordinates of the point which divides the line joining the points (−3, 7) and (9, −1) internally in the ratio 3 : 1? **(+1, -0.33)**

a. (0, 5)

b. (6, 1)

c. (3, 3)

d. $(\frac{9}{2}, 2)$

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---

26. What is the smallest number, which when divided by 4, 6, 10 and 15 leaves a remainder of 3 each time. **(+1, -0.33)**

a. 58

b. 126

c. 37

d. 63

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27. Select the different figure from the given figures. **(+1, -0.33)**

a. C

b. A

c. D

d. B

---

28. In 2017, who has been awarded the 'Indira Gandhi Prize for Peace, Disarmament and Development'? **(+1, -0.33)**

a. Ela Bhatt

b. Sonia Gandhi

c. Rahul Gandhi

d. Manmohan Singh

---

29. The resistivity of copper is **(+1, -0.33)**

a. 1.69×10^{-10} Ω-m

b. 1.69×10^{-8} Ω-m

c. $1.69 \times 10^{+8}$Ω-m

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d. $1.69 \times 10^{-9}\Omega$-m

---

30. _____ is the autobiography of tennis champion Sania Mirza. **(+1, -0.33)**

a. Ace Against Volleys

b. Ace and volleys

c. Ace against odds

d. Ace and odds

---

31. World press freedom is celebrated on _____. **(+1, -0.33)**

a. 15 August

b. 20 October

c. 10 June

d. 3 May

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---

32. Choose the correct mirror image of the following figure from the given four alternatives. **(+1, -0.33)**

Question Figure:

Option Figure:

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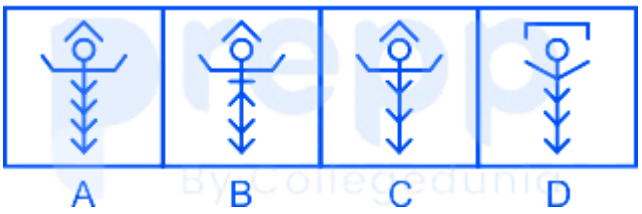

a. B

b. C

c. A

d. D

---

33. 1, 4, 9, 16,_ _ _ _ _ _ _, 36, 49 are the missing numbers in the number series. **(+1, -0.33)**

a. 20

b. 24

c. 28

d. 25

---

34. Varsha was facing north, she turns 135° clockwise, then turns 45° anticlockwise, then again 225° clockwise. In which direction is he facing now? **(+1, -0.33)**

a. East

b. North

c. North West

d. West

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35. Given below is a statement followed by two assumptions I and II. Consider the statement and the following assumptions and decide which of the assumptions are implicit in the statement. **(+1, -0.33)**

Statements:

A teacher says to a student, "If you don't listen to me, I will punish you."

Assumptions:

I. After the warning the student might heed the teacher's words.

II. Punishment is the best way to discipline the students.

a. Neither the assumption I nor II is implicit.

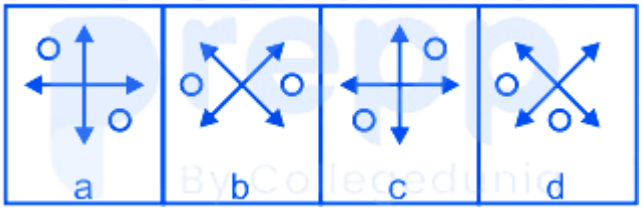
b. Only assumption I is implicit.

c. Both Assumptions I and II are implicit.

d. Only Assumption II is implicit.

---

36. Choose the odd one from the given figures. **(+1, -0.33)**



a. b

b. d

c. a

d. c

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37. If the sum of the square roots of two integers is $\sqrt{14+8\sqrt{3}}$, then what is the sum of the squares of these two integers? **(+1, -0.33)**

a. 144

b. 388

c. 100

d. 162

---

38. Which one of the following properties increases with an increase in atomic number in both the first and seventh groups of the modern periodic table? **(+1, -0.33)**

a. Reactivity with water

b. Atomic size

c. Oxidation properties

d. Highest valency state

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---

39. In the code language, HUG is written as SFT. What is the code for PET? **(+1, -0.33)**

a. LVG

b. KVH

c. KUG

d. KVG

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40. Which of the following is **not** a connective tissue? **(+1, -0.33)**

a. Nerve cells

b. Cartilage

c. Bone

d. Blood

41.

(+1, -0.33)

Choose the correct image for the above blank (?) from the options given below.

a.

b.

c.

d.

---

42. Which of the following funds can be used by the Government of India in case of emergency or calamities? **(+1, -0.33)**

a. Contingency fund

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b. Consolidated funds

c. Public Fund

d. General fund

---

43. How many national parks are there in Uttarakhand? **(+1, -0.33)**

a. 4

b. 8

c. 10

d. 6

---

44. If tanθ = $\frac{3}{5}$, then find the value of $\frac{5\sin\theta+2\cos\theta}{5\sin\theta+3\cos\theta}$? **(+1, -0.33)**

a. $\frac{7}{8}$

b. $\frac{7}{6}$

c. $\frac{3}{2}$

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

---

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

The letters numbered 20, 1, 7, 5 are chosen to form a meaningful word.
What is the second letter of the word?

a. F

b. G

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c. A

d. T

---

46. If the rational numbers $\frac{4}{-9}$, $\frac{7}{18}$, $\frac{5}{-6}$, $\frac{2}{3}$ are arranged in ascending order, which of the following will be placed first? **(+1, -0.33)**

a. $-\frac{4}{9}$

b. $\frac{7}{18}$

c. $-\frac{5}{6}$

d. $\frac{2}{3}$

---

47. Some cylindrical containers without a lid are to be made from a rectangular sheet of metal measuring 2.2m × 2.1m. The diameter and height of the containers to be made are the same. The cost of manufacturing a container is Rs. 50. If the diameter of the container is to be made 14 cm, then find the total cost (in Rs.) to make the complete container. **(+1, -0.33)**

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a. 3,000

b. 5,000

c. 3,750

d. 2500

---

48. In which of the following cases, no work is done? **(+1, -0.33)**

a. A windmill is extracting water from a well.

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b. A donkey is carrying a weight on its back.

c. Suman is swimming in a pool.

d. An engine is pulling the train.

---

49. Which program was launched by Union Minister Uma Bharti in February 2018, for sustainable drinking water supply in rural Rajasthan? **(+1, -0.33)**

a. Swajal Scheme

b. Pure water scheme

c. Available water plan

d. Clean water plan

---

50. In ionic compounds, ions attract each other and are held together by a strong _____. **(+1, -0.33)**

a. electrostatic forces

b. magnetic forces

c. gravitational forces

d. electric forces

---

51. The perimeter of an equilateral hexagon is 72 cm. What is its area in cm^2? **(+1, -0.33)**

a. $144\sqrt{3}$

b. $216\sqrt{3}$

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c. $108\sqrt{3}$

d. $36\sqrt{3}$

---

52. In a certain code MEMORY is written as ROMEMY. Then how will SCIENTIST be written according to that code? **(+1, -0.33)**

a. SITNEICST

b. SITNELGKL

c. ICSTISET

d. TENTVEGS

---

53. Who is the author of the ancient Sanskrit grammar book 'Ashtadhyayi'? **(+1, -0.33)**

a. Sushruta

b. Jaydev

c. Paṇini

d. Surdas

---

54. Select the correct figure that comes next in the given series of four figures. **(+1, -0.33)**

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a.

b.

c.

d.

---

55. Which of the following correctly represents the relationship between them. **(+1, -0.33)**

A) Singing

B) Dancing

C) Art

a.

b.

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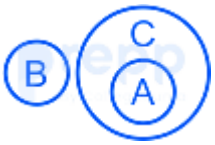
c. 

d.

---

56. Instantaneous velocity and Average velocity are equal when the object _____. **(+1, -0.33)**

a. have uniform acceleration

b. walking in a circle

c. have variable acceleration

d. have zero acceleration

---

57. Consider the following statements and arguments and decide which of the arguments is stronger. **(+1, -0.33)**

Statements:

Is it necessary to cut the banyan tree standing in the middle of the road?

Argument:

I. Yes, because it obstructs the traffic. Also, there's going to be a big two-way project.

II. No, the road should be narrowed by dividing it into sections or a signal can be installed. Banyan trees will help in maintaining the supply of oxygen.

a. Neither argument I nor II is strong.

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b. Only argument II is strong.

c. Only argument I is strong.

d. Both Arguments I and II are strong.

---

58. The sum of the present ages of two cousins is 52 years. 14 years ago the age of the elder brother was three times that of the younger brother. What is the present age of elder brother? **(+1, -0.33)**

a. 30 years

b. 28 years

c. 34 years

d. 32 years

---

59. A solid cylinder whose base radius was 6 cm and height 9 cm is melted to form a solid sphere. The radius of this sphere is _____ cm. **(+1, -0.33)**

a. $3\sqrt[3]{9}$

b. $4\sqrt[3]{3}$

c. $3\sqrt[3]{3}$

d. 27

---

60. Select the correct water image from the following figures. **(+1, -0.33)**

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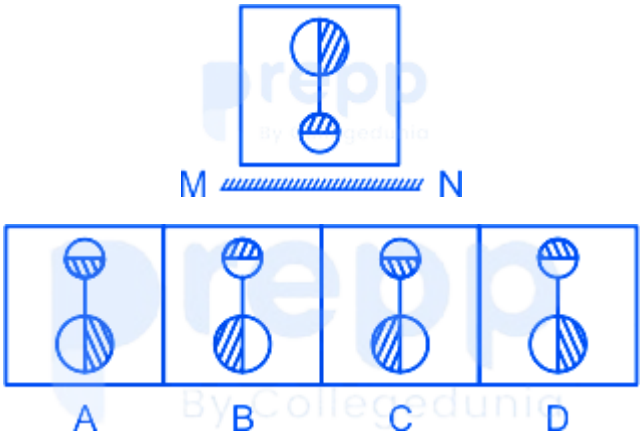

a. B

b. D

c. A

d. C

---

61. Water flowing at a hydroelectric power station can rotate a turbine because it contains- **(+1, -0.33)**

a. Electrical energy

b. Chemical energy

c. Kinetic energy

d. Potential energy

---

62. What number would come in place of question mark (?) in the series? **(+1, -0.33)**

2, 7, 19, 31, ?, ?

a. 26, 28

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b. 47, 57

c. 37, 41

d. 31, 33

---

63. The company made sales of Rs. 5,00,000 in 1 year. There was an increase in sales of 35% in Year 3 as compared to Year 1. What is the actual profit in year 3? **(+1, -0.33)**

a. Rs. 2,50,000

b. Rs. 6,75,000

c. Rs. 6,00,000

d. Rs. 1,75,000

---

64. A man can buy 4 more kg of sugar for Rs. 16 after reducing its price by Rs. 2/kg. What was the price of sugar earlier? **(+1, -0.33)**

a. Rs. 4/kg

b. Rs. 2/kg

c. Rs. 8/kg

d. Rs. 16/kg

---

65. What is the number of possible faces (without inverting them) in a tetrahedron? **(+1, -0.33)**

a. 4

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b. 2

c. 3

d. 1

---

66. _____ was started by Lord Cornwallis in Bengal, Bihar and Orissa. **(+1, -0.33)**

a. Permanent Settlement

b. Ryotwari System

c. Izaredari System

d. Mahalwari System

---

67. _____ are the regions where pressure, as well as density, is high. **(+1, -0.33)**

a. Rarefaction

b. Compression

c. Dimension

d. Ascent

---

68. The potential difference is 40V. Find the work done to transmit a charge of 0.5C? **(+1, -0.33)**

a. 20 J

b. 20 Ω

c. 20 A

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d. 20 Ω-m

---

69. Which of the following is formed when vaporized carbon condenses in an inert gas atmosphere? **(+1, -0.33)**

a. Fullerene

b. Graphite

c. Coke

d. Carbon black

---

70. Asian Games was first held in Delhi in the year _____. **(+1, -0.33)**

a. 1951

b. 1956

c. 1953

d. 1952

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---

71. The SI unit of _____ is joule/second? **(+1, -0.33)**

a. Work

b. Force

c. Thrust

d. Power

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72. What products are produced in the chlor-alkali process? (+1, -0.33)

a. Chlorine and Calcium Hydroxide

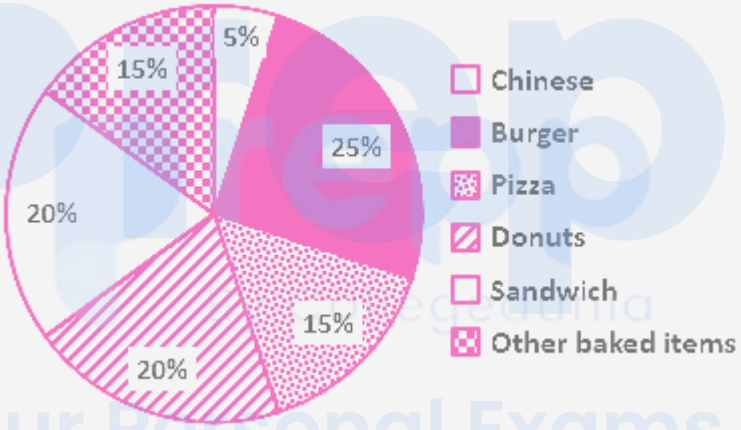
b. Chlorine and Potassium Hydroxide

c. Chlorine and Aluminum Hydroxide

d. Chlorine & Sodium Hydroxide

---

73. The following pie diagram shows the information on sales of different types of food items by restaurant "XYZ". (+1, -0.33)



The total revenue received by the restaurant in November 2017 was 35 lakhs.

How much revenue was generated by restaurant "XYZ" in 2017 through the sale of donuts?

a. 7 lakh

b. 10 lakh

c. 8.75 lakh

d. 5.25 lakh

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74. If the L.C.M. of two numbers 48 and 176 is equal to 4 × m, then find the value of m. **(+1, -0.33)**

a. 112

b. 142

c. 122

d. 132

75. Read the given question and decide which of the following statements are sufficient to answer the question. **(+1, -0.33)**

Question:

In which direction is city X with respect to city Y?

Statements:

I. X is to the north-west of Z.

II. X is to the north of M who is to the west of Z.

III. M is to the north-west of Y.

a. Only I and II are sufficient.

b. Only II and III are sufficient.

c. Only I and III are sufficient.

d. Only III is sufficient.

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76. Read the following information carefully and answer the question given below. **(+1, -0.33)**

There are 9 friends P, Q, R, S, T, U, V, W and X living in the apartment respectively. R is 2 km east of Q. P is 1 km north of Q and W is 2 km south of P. V is 1 km west of W. While S is 3 km east of V and U is 2 km north of V. X is in the midpoint of Q and R while T is in the midpoint of W and S. What is the distance between P and U?

a. 3 km

b. 1.5 km

c. 1 km

d. 2 km

---

77. A man swims 4 km upstream in 5 hours and 16 km downstream in 5 hours. What is the speed of the stream? **(+1, -0.33)**

a. 2.2 km/h

b. 3.2 km/h

c. 1.2 km/h

d. 1.5 km/h

---

78. Unregulated means of raising funds for projects using cryptocurrencies such as Bitcoin, D.A.S.H., Ethereum, Monero, Litecoin, and Z-cash have been named _____. **(+1, -0.33)**

a. Initial, Coin Offering

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b. Crypto Currency Offering

c. Digi Coin Offering

d. In Digi Currency

---

79. _____ state has launched Indira Canteen Scheme to provide low-cost food to the urban poor. **(+1, -0.33)**

a. Tamil Nadu

b. Assam

c. Rajasthan

d. Karnataka

---

80. There are 100 children in a primary school. The number of children who like blue and red is 30. The number of children who like yellow and blue is 20. The number of children who like only one color is 45. No child likes only yellow and red. How many children like all three colours? **(+1, -0.33)**

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a. 5

b. 15

c. 10

d. 2

---

81. What is the value of $0.92 - 0.126 \div 0.6 + 6.7 \times 0.03$? **(+1, -0.33)**

a. 0.911

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b. 1.52

c. 2.72

d. 0.83

---

82. Choose the odd option. **(+1, -0.33)**

A	B	C	D
5E	O14	T20	25Y

a. D

b. C

c. A

d. B

---

83. The three given shapes form a valid figure and identify the figure from the options given below? **(+1, -0.33)**

a.

b.

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c.

d.

---

84. The beings of the phylum are exclusively free-living beings in the ocean. **(+1, -0.33)**

a. Nematoda

b. Mollusca

c. Arthropoda

d. Echinodermata

---

85. The sum of first 200 whole numbers is- **(+1, -0.33)**

a. 20100

b. 19900

c. 20000

d. 19800

---

86. Desert National Park is in _____. **(+1, -0.33)**

a. Assam

b. Gujarat

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c. Rajasthan

d. Kerala

---

87. Neelu cuts 2 kg of yarn in 12 days working 3 hours a day. How much time will she take to cut 10 kg of yarn working 4 hours a day? **(+1, -0.33)**

a. 48 days

b. 45 days

c. 26 days

d. 32 days

---

88. 4 years ago, Mitesh's age was twice that of Pranav. 11 years ago, Mitesh's age was thrice that of Pranav. What is Mitesh's present age? **(+1, -0.33)**

a. 36 years

b. 28 years

c. 34 years

d. 32 years

---

89. Who is Ilavenil Meena Kandasamy? **(+1, -0.33)**

a. Poet, Author and Activist

b. Composer, Music Producer and Music Director

c. Artist, Sculptor and Historian

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d. Producer, Director and Screenwriter

---

90. _____ introduced the Izaredari system, according to which the right to collect revenue was given to the highest bidder for a period of 5 years. **(+1, -0.33)**

a. Lord Cornwallis

b. Warren Hastings

c. Lord Dalhousie

d. Robert Clive

---

91. The SI unit of displacement is _____. **(+1, -0.33)**

a. Meter

b. Kilometer

c. Centimeter

d. Meter per second

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---

92. What is the remainder obtained when $4x^6 - 5x^3 - 3$ is divided by $x^3 - 2$? **(+1, -0.33)**

a. 3

b. 2

c. 0

d. 1

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

Petty : Serious :: Yell :

a. Whisper

b. Shout

c. Sing

d. Talk

---

94. _____ element has the lowest ionization energy. **(+1, -0.33)**

a. Sodium

b. Helium

c. Francium

d. Caesium

---

95. Read the given question and decide which of the following statements are sufficient to answer the question. **(+1, -0.33)**

Question: P, Q, W, V, and S are standing in a row in descending order of their weight. Who's standing in the middle?

Statements:

1. P is heavier than S and V is lighter than S.

2. Q is heavier than P and W is lighter than V.

a. Only statement 2 is sufficient.

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b. Statements 1 and 2 both are insufficient.

c. Only statement 1 is sufficient.

d. Statements 1 and 2 both are sufficient.

---

96. What is the size of the new Rs. 500 banknote? **(+1, -0.33)**

a. 66 mm × 150 mm

b. 66 mm × 105 mm

c. 66 mm × 151 mm

d. 66 mm × 115 mm

---

97. What is the cardiac cycle? **(+1, -0.33)**

a. A beat and a pulse rate

b. a mechanoreceptor and a pulmonary cycle

c. a cycle of contraction and relaxation of the heart

d. double atrioventricular valve opening

---

98. Urmi and Lokesh started partnership with an investment of Rs. 11,250 and Rs. 13,125 respectively but Lokesh had to withdraw his investment after 8 months due to financial crisis. In what ratio should the profit of the first 12 months be divided between both of them? **(+1, -0.33)**

a. 7 : 9

b. 9 : 7

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c. 7 : 6

d. 6 : 7

---

99. The number of electrons present in an atom of an element is equal to its _____. **(+1, -0.33)**

a. Atomic number

b. Electron affinity

c. Atomic mass

d. Equivalent weight

100.

(+1, -0.33)

Which of the following option figures would be suitable for the ? symbol above?

a. A

b. B

c. D

d. C

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Answers

1. **Answer: a**

Explanation:

The correct answer is **Oxygen**.

⭐ **Key Points**

- Life on Earth started about **4 billion years ago**.
- **Initially, there was no oxygen in the earth's atmosphere, gradually oxygen was created and eventually it reached the present level**.
  - **Oxygen production** is **done by green plants**, which take carbon dioxide from the atmosphere and release oxygen during photosynthesis.
  - **The first green plants** to grow on Earth were green algae called **'cyanobacteria'.**

⭐ **Additional Information**

- **Methane** (CH_4) **-**
  - It is a **colorless, odorless, and flammable** gas.
  - It is found in small amounts in the Earth's atmosphere.
  - It is a **potent greenhouse gas** and is used as a fuel around the world.
- **Hydrogen -**
  - It is the **lightest** and the **first element** of the **periodic table.**
  - It was **discovered by Henry Cavendish** in 1766 and **Lavaschie named it 'hydrogen'** in 1883.
- **Ammonia** (NH_3) **-**
  - It is a **colorless gas** with a **pungent odor.**
  - It is manufactured industrially by the **'Haber process'.**

---

2. **Answer: a**

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Explanation:

The correct answer is **different speeds in different mediums**.

⭐ **Key Points**

- **Sound waves -**
  - **The nature of sound waves** is '**longitudinal mechanical** '.
  - This means that a medium (solid, liquid, gas) is required for the propagation of sound.
  - **The speed of sound is maximum in solids, less in liquids, and least in gases**.

⭐ **Additional Information**

- On the basis of frequency, sound waves are mainly of **three types -**
  - **Infrasonic Waves -**
    - The frequency of these waves is **below 20 Hz.**
  - **Ultrasonic Waves-**
    - The frequency of these waves is **above 20000 Hz.**
    - Human beings cannot ordinarily hear both inaudible and ultrasonic waves.
    - A bat is an organism that has the ability to both generate and hear ultrasonic waves.
  - **Audible Waves-**
    - These waves can be heard by humans.
    - The frequency of these waves is **between 20 Hz to 20000 Hz.**

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---

3. **Answer: a**

Explanation:

The correct answer is **Hydrogen**.

⭐ **Key Points**

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- When hydrochloric acid (HCl) reacts with zinc metal, hydrogen gas and zinc chloride are formed.
  - $Zn + 2HCl \rightarrow ZnCl_2 + H_2$ (Hydrogen)

⭐ Additional Information

- Oxygen -
  - It is the element found in the **highest amount** (about 46.6%) on the **earth's crust.**
  - It is **colorless, tasteless, and odorless gas.**
  - It has been discovered by **J. Priestley and Shelley** .
  - Its **amount in the atmosphere** is about **21%** .
- Hydrogen chloride (HCl) -
  - It is a compound with the **chemical formula HCl** .
  - It is a **colorless gas** at room temperature,
  - This acid is a valuable **reactant in chemistry** .
- Chlorine -
  - It is a **halogen** and is placed in **group 17** in the **periodic table.**
  - It is found as a gas at **normal temperature and pressure** .
  - It is placed in **group 17** in the **periodic table.**
  - It is used to make **paper and cloth.**
  - In the presence of air, it reacts with water to form **hydrochloric acid.**

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---

4. **Answer: a**

Explanation:

The correct answer is Srinivasa Ramanujan.

⭐ Key Points

- Ramanujan -
  - He was one of **the greatest mathematicians.**
  - The best book on this is by Robert Kenigel called 'The Man Who Knew Infinity: A Life of the Genius Ramanujan'.

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- In 2015, Matthew Brown made a film on the book of the same name.

⭐ Additional Information

- **Abdul Kalam -**
  - His full name was **Dr. Avul Pakir Jainulabdeen Abdul Kalam.**
  - He was born on **15 October 1931** in Rameswaram, Tamil Nadu.
  - He was the **11th President of India,** who **passed away on 27 July 2015.**
  - He was awarded the ' **Bharat Ratna'** for his achievements.
  - His most **notable work** was **'India 2020'.**
- **M.S Swaminathan Life -**
  - He is considered the father of the **'Green Revolution in India'.**
  - With his efforts, in 1966, **hybrid seeds of high-yielding wheat** were developed by mixing the seeds of Mexico with the domestic varieties of Punjab.
  - As a result of which **large production of wheat** happened for the first time in the country.
- **CV Raman -**
  - He was an **Indian physicist.**
  - He was awarded the **Nobel Prize** in **Physics in 1930** for his outstanding work on the scattering of light.

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5. **Answer: a**

Explanation:

The statement declares that protein-rich food is better than junk food.

- Argument I agrees with the statement and justifies it by stating the benefits of protein-rich foods. It claims that food rich in proteins is good for overall development in children. Therefore, argument I is strong.
- Argument II disagrees with the statement by saying that junk food is tastier. But it is not logically or factually correct. Taste is a perceptive quality and is not a valid factor to decide which food is better. So, argument II is not strong.

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

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6. **Answer: c**

Explanation:

The logic followed here is:-

- Pentala Harikrishna, Koneru Humpy, and Viswanathan Anand are Chess players
- Saina Nehwal is a Badminton player.

So, Saina Nehwal is different from others.

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

---

7. **Answer: d**

Explanation:

The correct answer is **5/6 mgR**.

Concept:

- If we want to launch any satellite in earth's or any other planet's orbit certain minimum velocity is required by the satellite to have a stable orbit this velocity is known as critical velocity
- As critical velocity is the minimum velocity required to put a satellite into orbit. And orbital velocity is the velocity required to keep a satellite moving in an orbit.
- Hence critical velocity of a satellite is given as $v_c = \sqrt{\frac{GM}{R}}$
- Similarly, in physics, escape velocity is the minimum speed needed for a free, non-propelled object to escape from the gravitational influence of a massive body, that is, to achieve an infinite distance from the planet.

And this escape velocity is given as $v_e = \sqrt{\frac{2GM}{R}}$

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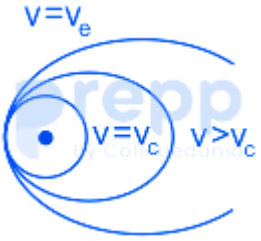

- The above diagram shows how trajectory traced will depend on the velocity of the satellite
- Here v is the velocity of the satellite at any instance and vc and ve are critical and escape velocity respectively

Hence if v = vc, the satellite will trace the circular path

If v > ve, the satellite will trace the elliptical orbit

If v = ve, the satellite will escape earth's orbit and will trace the parabolic orbit

G = gravitational constant

M = mass of the planet

R = distance between satellite and centre of the earth

Calculation:

Now, gravitational potential energy is the energy stored in an object as the result of its vertical position or height.

Using the equation of gravitational potential energy,

P.E= $\frac{-GM}{r}$

The potential energy at altitude= $\frac{GmM}{3R}$

Orbital velocity: Orbital velocity is the velocity at which a body revolves around the other body. The velocity of an orbit depends on the distance between the object and the centre of the earth.

V orbit = $\frac{\sqrt{GM}}{R}$

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Where the mass of the body at centre = M

Gravitational constant = G

The radius of the orbit = R

Here, $V_0 = \frac{GmM}{R+h}$

Now the total energy is:

$E_f = 12mv_02\ \frac{-GmM}{3R}$

$E_f = \frac{12GmM}{3R} - \frac{GmM}{3R}$

$E_f = \frac{-GmM}{6R}$

Now, $E_i = E_f$ (total energy of the satellite is equal to the total energy of the planet).

Also, the minimum required energy will be

$K.E = \frac{GmM}{R} - \frac{GmM}{6R}$

$K.E = \frac{5}{6}mgR$

---

8. **Answer: d**

Explanation:

The correct answer is **He had odd-looking qualities**.

- **Mendel** chose **pea plants** because they had **easily observable characteristics** and there were two contrasting observable traits of each character.

⭐ **Key Points**

- **Johann Mendel** was born on **20 July 1822 Heinzendorf bei Odrau, Silesia, Austrian Empire.**
- Mendel's **pea plant experiments** conducted between **1856** and **1863** established many of the rules of heredity, now referred to as the **laws of Mendelian**

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inheritance.

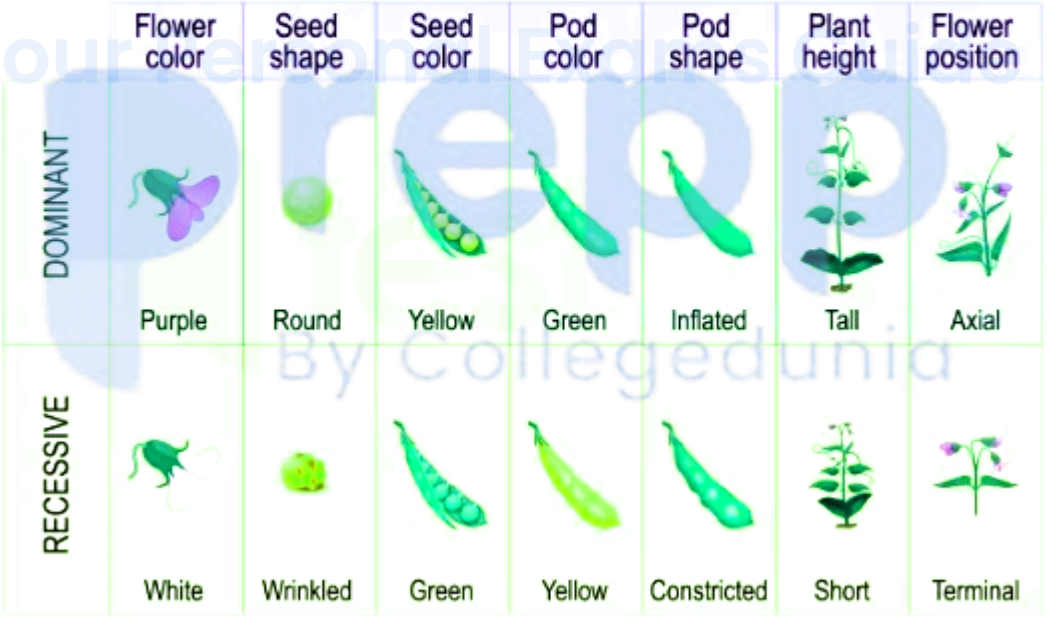
- **Mendel** worked with **seven characteristics of pea plants:**
  - Plant height, pod shape and colour, seed shape and colour, and flower position and colour.

⭐ Additional Information

- **The reason for the selection of pea plants for the genetic experiments are:**
  - They have excellent disease resistance and have an optimal rate of survival.
  - The generation time of pea plants is less.
  - Easy to obtain pure breed plant through self-fertilization.
  - The flowers of pea plants are hermaphrodite, i.e flowers have bisexual characteristics.
  - Easy to grow in the garden.

⭐ Important Points

Mendel's Laws



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9. **Answer: a**

Explanation:

Given:

$\frac{\sqrt{0.64}}{\sqrt{0.16}}$

Calculation:

Let $\frac{\sqrt{0.64}}{\sqrt{0.16}}$ be a

So, $a^2 = 0.64/0.16$

$\Rightarrow a^2 = 4$

$\Rightarrow a = 2$

∴ **Required answer is 2**

---

10. **Answer: b**

Explanation:

The correct answer is **25 years**.

⭐ **Key Points**

- A **prime minister** must be an Indian resident.
  - The member of Lok Sabha or Rajya Sabha must be the Prime Minister. If at the time of appointment, the person chosen as the Prime Minister is neither a member of the Lok Sabha nor of the Rajya Sabha, he has to become a member of either house within six months.
  - **A prime minister must be above 25 years of age if he is a member of the Lok Sabha, or over 30 years of age if he is a member of the Rajya Sabha**.

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- A Prime Minister shall not hold any office of profit under the Government of India or the Government of any other State or under any local or other authority subject to the jurisdiction of any of the above States.
- **The minimum age** to become the **President of India is 35 years.**

⭐ Additional Information

- **According to Article 74(1) of the Constitution -**
  - There shall be a **Council of Ministers** to assist and advise the President **headed by the Prime Minister.**
  - **The President** shall perform his functions in accordance with the advice of this **Council of Ministers.**
  - Thus the real executive power is vested in the Council of Ministers, which is headed by the Prime Minister.

---

11. **Answer: c**

Explanation:

The Correct Answer is **Option 3** i.e **A**.

Instrument	Use
Pyrometer	Measures very high temperature
Thermostat	**Regulates temperature at a particular point or degree**
Thermometer	Measures temperature
Tonometer	To measure the pitch of a sound
Thermocouple	It is a kind of sensor used to measure the temperature at a specific point in the form of the EMF or an electric current.

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12. **Answer: a**

Explanation:

Given:

Numbers are 4, 1, 1, 6, 2 and 7

Concept used:

Mean = Sum of numbers/Total number of numbers

Calculation:

Total of numbers = 4 + 1 + 1 + 6 + 2 + 7 = 21

Mean = 21/6 = 3.5

∴ **Required mean is 3.5**

13. **Answer: a**

Explanation:

Given:

7, 7^{2} , 7^{3} , _____ 7^{n}

Concept used:

Gm of two no a & b = √ab

Calculation:

GM = $\sqrt[n]{(a^{1}.a^{n})}$

⇒ GM of $\sqrt[n]{(7, 7^{2}, ...7^{n})}$

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$\Rightarrow \sqrt[n]{7^{n(n+1)/2}}$

$\Rightarrow (7^{n(n+1)/2})^{1/n}$

$\Rightarrow 7^{\frac{n+1}{2}}$

∴ Required answer is $7^{\frac{n+1}{2}}$

---

14. Answer: d

Explanation:

Calculation:

LCM of 60, 5, and 6 is 60

Multiplying each fraction with LCM 60

n/60 × 60 = n

1/5 × 60 = 12

1/6 × 60 = 10

So, Numbers are n, 12, 10

10 < n ≤ 12

According to the options, the only possible value of n is 11 and 12

∴ The correct answer is 11 and 12

Note:

We have found some mistakes in the given question, so we have changed the question according to that

---

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15. **Answer: d**

Explanation:

The correct answer is **Competition act.**

⭐ **Key Points**

- **Competition Act, 2002 -**
  - This act was passed with the **aim of promoting healthy competition in India.**
  - **This act replaced the Monopoly and Restrictive Practices Act 1969**.
  - Under this '**Competition Commission of India**' was established.

⭐ **Additional Information**

- **Monopolies and Restrictive Trade Practices Act, 1969 -**
  - It was implemented during the **Fourth Five Year Plan.**
  - This Act (MRTP Act) was implemented in India under **the Industrial Reforms.**
  - Its purpose was to prevent the centralization of economic power and to control monopolies.
  - Apart from this, the other objective was to prevent restrictive and unfair trade.

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16. **Answer: c**

Explanation:

Given:

Present population of that city is 30,00,000

Increase rate = 3%

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Concept used:

Population after n years = Population$(1 + r/100)^n$

Calculation:

Population after 3 years = $3000000 \times 103/100 \times 103/100 \times 103/100$

$\Rightarrow 3 \times 103 \times 103 \times 103$

$\Rightarrow 3278181$

∴ The population after 3 years will be 3278181

---

17. Answer: a

Explanation:

The statement tells that they are looking for a software engineer.

- The statement starts with the word 'if'. Thus, assumption I is not implicit since the statement is not declaring that you are an engineer. It is stating a condition based on whether you are an engineer or not.
- As they are looking for a software engineer, it is implicit that they need one because they have a project for him/her. So, assumption II is implicit.

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

---

18. Answer: c

Explanation:

The correct answer is Boiling point.

⭐ Key Points

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- **Boiling point -**
  - **The temperature at which a liquid substance begins to change into a vapor state is called the boiling point of that substance.**
  - For example, the boiling point of water is **100 degrees centigrade** .

⭐ **Additional Information**

- Melting point -
  - The temperature at which a solid substance starts melting into a liquid state is called the melting point of that substance.
- **Freezing point -**
  - When **the state of a substance changes from liquid to solid state** .
  - So the temperature at which this occurs is called the freezing point.
- **The heat of neutralization -**
  - It is the **heat produced** when an **acid and a base react to form a salt plus water.**

---

19. **Answer: d**

Explanation:

Calculation:

Let he marked 'a' number of questions as right and 'b' number of questions as wrong

According to the question,

4a - b = 202 ----(1)

a + b = 98 ----(2)

From eq 1 and eq 2,

5a = 300

⇒ a = 60

∴ 60 questions have been answered correctly by him

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20. **Answer: b**

Explanation:

The correct answer is **44th**.

⭐ Key Points

- **Justice Jagdish Singh Khehar-**
  - **He was the 44th Chief Justice of India**.
  - He took oath as the Chief Justice on **4th January 2017.**
  - He is the first Chief Justice of the Supreme Court **from the Sikh community.**

⭐ Additional Information

- **Justice Nathulapati Venkata Ramanna -**
  - He is the **48th Chief Justice** of the country.
- **The President appoints** the Chief Justice of the Supreme Court and other judges.
- **The Chief Justice and other judges of the High Court** are **appointed by the President.**

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21. **Answer: d**

Explanation:

The correct answer is **26u**.

- **Molar mass** is defined as the **mass of a substance** for a **given amount.**
- The **amount of molecules** or **atoms** or **compounds present** in one mole of a substance is given by this.
- Mass of Carbon = 12 u
- Mass of Hydrogen = 1 u

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- The molar mass of ethyne
  - $C_2H_2 = (2 \times 12 + 2 \times 1) = 26$ u
- The molar mass of ethyne = **26 g**
- Molar mass SI unit is **g/mol.**

⭐ Additional Information

- **Ethene** is the formal **IUPAC name** for $H_2C{=}CH_2$, but it also goes by a common name: **Ethylene.**
- The name **Ethylene** is used because it is like an **ethyl group** (CH_2CH_3) but there is a **double bond between the two carbon atoms in it.**
- Ethene has the formula C_2H_4 and is the simplest **alkene** because it has the **fewest carbons** (two) necessary for a **carbon-carbon double bond.**
- **Ethene** (ethylene) is the most important organic **chemical** , by tonnage, that is manufactured. It is the **building block** for a **vast range of chemicals** from **plastics** to **antifreeze solutions and solvents.**

---

22. **Answer: b**

Explanation:

Calculation:

An acute triangle (or acute-angled triangle) is a triangle with **three acute angles (less than 90°)**

Angles are 50°, 60°, 70°

∴ **The triangle is an acute triangle**

---

23. **Answer: c**

Explanation:

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The logic followed here is:-

- Prose and poetry are forms of literature.
- Similarly, conversation and Debate are forms of Communication.

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

---

24. Answer: c

Explanation:

The correct answer is **Pune**.

⭐ **Key Points**

- **Shree Shiv Chhatrapati Sports Complex -**
  - **It is an Indian sports complex located in Pune, Maharashtra.**
  - The campus is located at a distance of about 14-15 km from Pune city and 4-5 km from Hinjawadi, Pune.
  - The complex was the site of the **2008 'Commonwealth Youth Games'.**

⭐ **Additional Information**

- **Nashik -**
  - It is located on the bank of the **Godavari river.**
  - It is the fourth largest city in Maharastra state.
- **Bhubaneswar -**
  - It is the **capital of Orissa** state.
  - It is situated to the **southwest of the Mahanadi.**
- **Ahmedabad -**
  - It is a **district in the state of Gujarat.**
  - It is situated on the **banks of the Sabarmati River.**

---

25. Answer: b

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Explanation:

Given:

The line joining the points (–3, 7) and (9, –1) internally in the ratio 3 : 1

Concept used:

(x, y) = [{m1 × x2 + m2 × x1}/m1 + m2], [{m1 × y2 + m2 × y1}/m1 + 2]

Calculation:

Let P(x, y) be the point that divides the line segment internally.

Here, $m_1 = 3$, $m_2 = 1$

$(x_1, y_1) = (-3, 7)$ and $(x_2, y_2) = (9, -1)$

Putting the above values in the above formula, we get

⇒ x = [{3(9) + 1(-3)}/4], y = [{3(-1) + 1(7)}/4]

⇒ x = 24 /4 , y = 4 /4

x = 6, y = 1

∴ (6, 1) is the point that divides the line segment

---

26. Answer: d

Explanation:

Given:

Leaves remainder 3 when divided by 4, 6, 10 and 15

Concept used:

Here we will use the concept of L.C.M

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Calculation:

Let the number be N.

N = L.C.M (4, 6, 10, 15) × x + 3

⇒ N = 60x + 3

Put x = 1 so, number is 63

∴ Required answer is 63

---

27. Answer: c

Explanation:

The logic followed here is:-

- In figures A, B, and C, the smaller figure is shaded.
- In figure D, the larger figure is shaded.

So, figure D is different from others.

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

---

28. Answer: d

Explanation:

The correct answer is Manmohan Singh.

- Manmohan Singh was given this award for 2017 on the birth anniversary of Indira Gandhi.

⭐ Key Points

- Indira Gandhi Peace Prize –

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- This award is given every year **since 1986 by the Indira Gandhi Memorial Trust** in memory of Indira.
- **This award is given** to such a person of the world, who has made a **significant contribution in the work of social service,** disarmament, or development.

⭐ Important Points

Indira Gandhi Prize recipients:

Year	Recipient	Description
2017	Manmohan Singh	Former Prime Minister, Finance Minister, and Governor of the Reserve Bank of India
2018	Centre for Science and Environment	Not-for-profit public interest research and advocacy organization based in New Delhi, India.
2019	Sir David Attenborough	World renowned English broadcaster and natural historian
2021	Pratham	Pratham is an innovative not-for-profit learning organization created to improve the quality of education based in India.

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⭐ Additional Information

- **Ela Ramesh Bhatt –**
  - She is an eminent **social worker in India**.
  - He founded the **Sewa Co-operative Bank** in 1974.
  - He was awarded the 2010 **Niwano Peace Prize** on 13 May 2010.
- **Sonia Gandhi –**
  - She is an **Indian politician and the President** of the Indian National Congress party.
  - She is the **wife of former Prime Minister Rajiv Gandhi.**
- **Rahul Gandhi** –
  - He is the **son of Rajeev Gandhi.**

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29. **Answer: b**

Explanation:

The correct answer is 1.69×10^{-8} Ω-m.

- The resistivity of copper is 1.68×10^{-8} Ω-m.

⭐ Key Points

- The resistance (R) of a conductor is proportional to its length and inversely proportional to its cross-section.
  - **The SI unit** of electrical resistivity of a material is the **ohm-meter (Ω-m)**.

⭐ Additional Information

Substances	Resistivity
Diamond	10^{11} to 10^{18}
Gold	2.44×10^{-8}
Sea Water	2×10^{-1}
Iron	1.0×10^{-7}
Tungston	5.60×10^{-8}

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30. **Answer: c**

Explanation:

The correct answer is **Ace against odds**.

- "Ace Against Odds" -

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- Ace against Odds is Sania Mirza's official autobiography chronicling her journey to becoming one of India.
- Shah Rukh Khan released the book at a function in Hyderabad in July 2016.

⭐ Key Points

- Sania Mirza -
  - She is famous as **an Indian female tennis player.**
  - She won during the doubles at Wimbledon in the year **2004.**
  - In 2009, she became the **first female player** to win a Grand Slam for India.
  - She was awarded the **Arjuna Award** in 2005.

---

31. **Answer: d**

Explanation:

The correct answer is 3 May.

⭐ Key Points

- 'World Press Freedom Day' is celebrated every year on 3 May across the world.
  - The theme of the year 2021 of World Press Freedom Day is 'Information as a Public Good'.
  - India is ranked 142 in the 'World Press Freedom Index' 2021.
    - It is published every year by 'Reporters Without Borders'.

⭐ Additional Information

Day	Celebrate
20 October	World Statistics Day
15 August	Independence Day
10 June	World groundwater day

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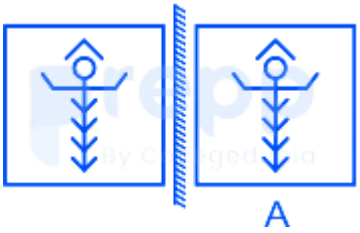
32. **Answer: c**

Explanation:

The mirror image of the question figure is as follows:

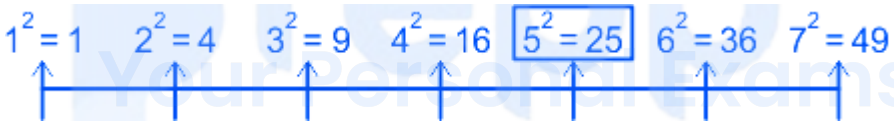


Hence, **"figure A"** is the correct answer.

33. **Answer: d**

Explanation:

The logic followed here is:-



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

34. **Answer: c**

Explanation:

- Step 1 - Facing North
- Step 2 - 135° clockwise
- Step 3 - 45° anticlockwise
- Step 4 - 225° clockwise

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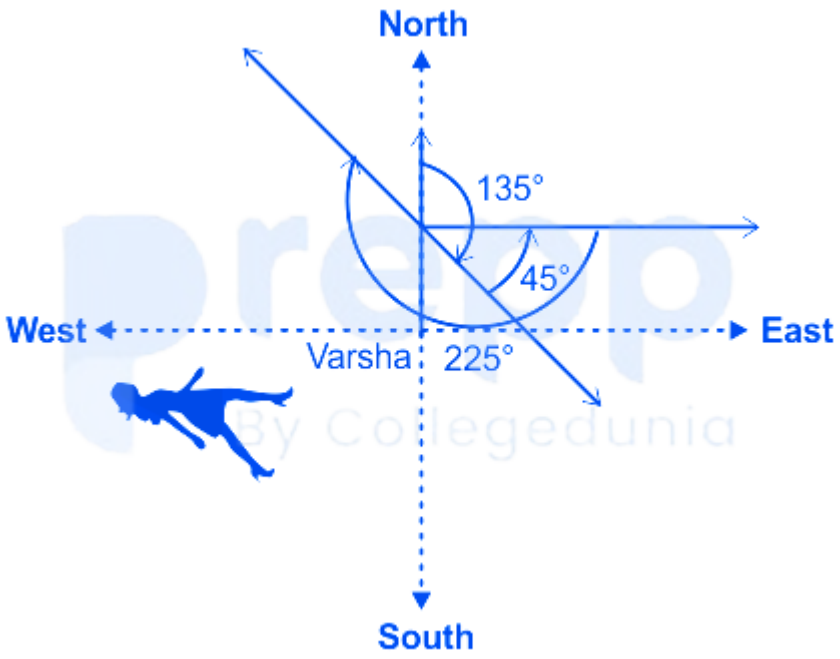

- He is facing north-west.

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

---

35. **Answer: b**

Explanation:

The statement talks about the warning that a teacher gave a student about listening to him/her or getting punished.

- The word "might" is used in the statement. This indicates a possibility. A teacher would not give a warning if he thinks that the student will not heed his words. So, the teacher might have assumed that the warning will be effective. Therefore, assumption I is implicit.
- Just because the teacher is using the threat of punishment to try and discipline the student, it cannot be termed as the best way to do the job. The statement does not indicate that the imposed punishment would be effective in disciplining the student. So, assumption II is not implicit.

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

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36. **Answer: b**

Explanation:

The logic followed here is:-

- Figures a, b, and c have two circles opposite to each other
- In figure d, the two circles are adjacent to each other.

So, figure d is different from others.

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

37. **Answer: c**

Explanation:

Calculation:

Let a be the first integer and b be the second integer

$\sqrt{a} + \sqrt{b} = \sqrt{14 + 8\sqrt{3}}$

We are asked to find $a^2 + b^2$.

Let's square both sides of the equation above.

$(\sqrt{a} + \sqrt{b})^2 = (\sqrt{14 + 8\sqrt{3}})^2$

$a + 2\sqrt{ab} + b = 14 + 8\sqrt{3}$

Since a and b are integers, we must have:

$a + b = 14$ and $2\sqrt{ab} = 8\sqrt{3}$

$a^2 + 2ab + b^2 = 196$

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If we square both sides of $2\sqrt{ab} = 8\sqrt{3}$, we have:

$4ab = 64 \times 3$

$2ab = 96$

$a^2 + 96 + b^2 = 196$

$a^2 + b^2 = 100$

∴ Required answer is 100

---

38. Answer: b

Explanation:

The correct answer is **Atomic size**.

⭐ **Key Points**

- **Atomic Size -**
  - The radius of an atom of an element tells the size of the atom.
  - **The size of an atom increases from top to bottom in a group of modern tables.**
  - Because the number of orbitals in an atom increases from top to bottom in a group, the size of the atom also increases.
  - The size of an atom decreases as you move from left to right in the periodic table of the modern periodic table.

⭐ **Additional Information**

- **Oxidation -**
  - It is the process by which the **positive charge on an ion increases or decreases** with the negative charge.
  - Example: In the formation of ferrous chloride ($FeCl_2$) from ferrous chloride ($FeCl_3$), the ferrous ion (Fe^{++}) changes to ferric ion (Fe^{+++}).
  - That is the positive charge on the iron ion increases.

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- There are **18 groups and 7 periods** in the **modern periodic table.**

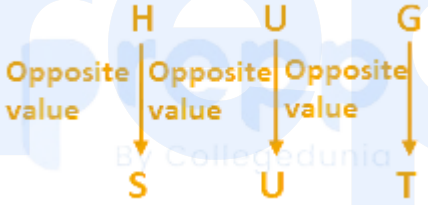
---

39. Answer: d

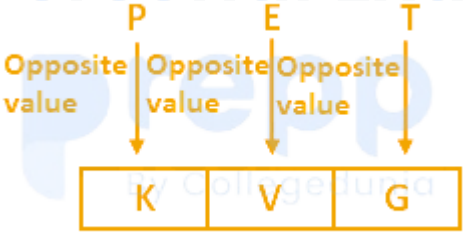
Explanation:

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

The logic followed here is:-



Similarly,



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

---

40. Answer: a

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Explanation:

The correct answer is **Nerve cells**.

⭐ **Key Points**

- **Connective tissue -**
  - It serves to **connect one part to another in the human body.**
  - It is found in every organ. It is a broad group of tissues.
  - The specific function of connective tissues is to assemble, envelop organs and keep them in place.
  - Examples of connective tissues are**adipose tissue, cartilage, bone, blood, and lymph**.
- Nerve cells -
  - It is an excitatory cell located in the nervous system.
  - The function of this cell is to exchange and analyze information with the brain.
  - This work is done by an electrochemical signal.

⭐ **Additional Information**

- **Cartilage -**
  - It is a **flexible connective tissue** found in the human body and other animals.
  - These are **made up of chondrocytes** cells established in our marrow.
  - Ear bone, nose bone, bone joints, etc. are made of cartilage.
- **Bone -**
  - It is the **hard part of the vertebrate** living beings that makes up the endoskeleton.
  - It helps in supporting the body and protecting various parts of the body,
  - It is composed of many types of minerals besides calcium.

---

41. **Answer: a**

Explanation:

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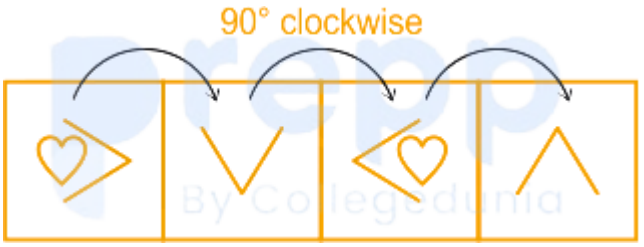
The logic followed here is:-

- The angle is rotating 90° clockwise.
- A heart is added in alternate figures.
- Therefore, the answer figure will have an angle only and the angle should have its vertex pointing upwards.

Thus, we get the following series:



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

---

42. Answer: a

Explanation:

The correct answer is Contingency fund.

⭐ Key Points

- Contingency Fund -
  - It is mentioned in Article 267 of the Constitution.
  - This fund is controlled by the President or the government.
  - Constituted under Article 267(1) of the Indian Constitution, the Contingency Fund of India is used at a time when there is a crisis in the nation - a natural calamity, for instance, and money is required to deal with it.

⭐ Additional Information

- Consolidated funds -
  - It is mentioned in Article 266 of the Constitution.

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    - In this fund all collected taxes/revenue deposits, loans taken are deposited.
    - This is the largest fund of India which is kept under the Parliament.
    - No money can be withdrawn/deposited in it without the prior approval of the Parliament.
- Public Fund -
    - It is mentioned in Article 266(2) of the Constitution.
    - The money that the Government of India collects in addition to the income received from tax collection is called the 'Public Fund' of India.
    - 'Employees Provident Fund' has been deposited in the Public Fund of India.
    - It is a fund under the executive. The money spent from this is checked by the Controller General of Accounts.
    - Article 266(2) also describes the public funds of the states.

---

43. Answer: d

Explanation:

The correct answer is **6**.

- The newly formed state of Uttarakhand is renowned for its unique biodiversity.
    - Due to biodiversity present in the state, 12 percent of the total geographical area is protected areas which include **6 National Park, 7 Wildlife Sanctuary, 4 Conservation Reserve & 1 Biosphere Reserve**.

⭐ **Key Points**

- There are **6 National Parks in Uttarakhand**, namely :
    - Jim Corbett National Park.
    - Nanda Devi National Park.
    - Rajaji National Park.
    - Valley of Flowers National Park.
    - Gangotri National Park.
    - Govind National Park.

⭐ **Additional Information**

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- **Gangotri National Park**
  - Gangotri National Park established in **1989, is situated in Uttarkashi** district in the upper catchment of the Bhagirathi river.
- **Jim Corbett National Park**
  - It is the **oldest national park in India.**
  - It was established in **1936 as Hailey National Park to protect the endangered Bengal Tiger.**
  - It is located in **Ramnagar,** Uttarakhand.
- **Rajaji National Park**
  - It is both a **national park and a tiger reserve.**
  - It is located in the **Shivalik range** of the Himalayas.
  - It was established in **1983** after three sanctuaries (**Chilla, Motichur, and Rajaji)** were merged into Rajaji National Park.
  - It has been named after **C. Rajagopalachari,** a freedom fighter and last Governor-General of Independent of India.
- **Nanda Devi National Park**
  - The Nanda National Park is one of the most spectacular wilderness areas located in the **Chamoli District** of Uttarakhand.
  - The park was established as **Sanjay Gandhi National Park in 1982** and was later renamed Nanda Devi and Valley of Flowers National Park in **2005.**
  - It was made a **World Heritage Site by UNESCO in 1988.**

---

44. Answer: d

Explanation:

Given:

$\tan\theta = \frac{3}{5}$

Concept used:

$\tan\theta = \sin\theta/\cos\theta$

Calculation:

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tanθ = 3/5

sinθ/cosθ = 3/5

Now,

$\frac{5\sin\theta+2\cos\theta}{5\sin\theta+3\cos\theta}$ = $\frac{5\frac{\sin\theta}{\cos\theta}+2}{5\frac{\sin\theta}{\cos\theta}+3}$ [Divided by cosθ]

⇒ (5 × 3/5 + 2)/(5 × 3/5 + 3)

⇒ (3 + 2)/(3 + 3)

⇒ 5/6

∴ The required answer is 5/6

⭐ **Alternate Method**

tanθ = $\frac{3}{5}$ = $\frac{p}{b}$

h =?

Using the Pythagorean theorem,

h = $\sqrt{p^2+b^2}$

⇒ $\sqrt{3^2+5^2}$ = √ 34

$\frac{5\sin\theta+2\cos\theta}{5\sin\theta+3\cos\theta}$ = $\frac{5\times\frac{p}{h}+2\times\frac{b}{h}}{5\times\frac{p}{h}+3\times\frac{b}{h}}$

⇒ $\frac{5\times\frac{3}{\sqrt{34}}+2\times\frac{5}{\sqrt{34}}}{5\times\frac{3}{\sqrt{34}}+3\times\frac{5}{\sqrt{34}}}$ = $\frac{\frac{(15+10)}{\sqrt{34}}}{\frac{(15+15)}{\sqrt{34}}}$

⇒ $\frac{25}{30}$ = $\frac{5}{6}$

---

45. Answer: c

Explanation:

Given series:ABCDEFGHIJKLMNOPQRSTUVWXYZ

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- 20th letter = T,
- 1st letter = A,
- 7the letter = G,
- 5th letter = E.

Meaningful words = GETA and GATE

- GETA: second letter = E; this is not given in the options, so we can ignore this word.
- GATE: second letter = A

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

⭐ Additional Information

- GATE - a means of entrance or exit
- GETA - a Japanese wooden clog for outdoor wear
    - reference - English dictionary website Merriam-Webster

---

46. Answer: c

Explanation:

Given:

numbers are $\frac{4}{-9}$, $\frac{7}{18}$, $\frac{5}{-6}$, $\frac{2}{3}$

Concept used:

To find ascending order of fraction we need to get the LCM of the denominator

Calculation:

LCM of -9, 18, -6, 3 = 18

Multiplying each fraction with 18

So, numbers are = - 8, 7, - 15, 12

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So, order is = - 15, - 8, 7, 12

∴ Requried answer is is $-\frac{5}{6}$

---

47. Answer: a

Explanation:

Given:

Measurement of rectangle = 220 cm × 210 cm [1 m = 100 cm]

Diameter of the cylindrical containers = 14 cm

Cost of make a container = Rs. 50

Formula used:

CSA of Cylinder = 2πrh

Total surface area of the container = CSA + πr^2

Calculation:

Let n numbers of cylindrical containers to be made

Radius = 14/2 = 7 cm

According to the question,

$[2 \times 22/7 \times 7 \times 14 + 22/7 \times 7^2]n = 220 \times 210$

$\Rightarrow [7 \times 22\{4 + 1\}]n = 220 \times 210$

$\Rightarrow n = (220 \times 210)/(7 \times 110)$

$\Rightarrow n = 60$

Total cost = 60 × 50 = Rs. 3000

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∴ Total cost is Rs. 3000

---

48. **Answer: b**

Explanation:

The correct answer is A donkey is carrying a weight on its back.

- No work is done when a donkey is carrying a weight on its back.

⭐ Key Points

- Work is done if there is any change in Energy.
  - Energy is measured in the same unit as work because energy is defined via work (i.e. the capacity of a physical system to do work).
  - The SI unit for energy is the same as the unit of work Joule (J).

---

49. **Answer: a**

Explanation:

The correct answer is Swajal Scheme.

⭐ Key Points

- Swajal Yojana was launched by Uma Bharti the then Union Minister of Drinking Water and Sanitation.
  - It is a community-owned drinking water program for sustained drinking water.
  - The Ministry of Drinking water and Sanitation has launched the 2nd Swajal Yojana project at **Rajasthan.**
  - **90% of the project cost is funded by the Government and the remaining 10% is contributed by the beneficiary community**
  - The objective of the Swajal scheme is a single village piped water scheme, hence to have a low-cost scheme and maintenance cost that

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would reduce the tariff burden on the community.

⭐ Additional Information

- **Swajal scheme was launched in February 2018 under the National Rural Drinking Water Programme, in six states of Bihar, Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh, and Uttarakhand.**
  - This scheme **aims** at providing sustainable and adequate drinking water in rural areas.
  - The Scheme benefits have been extended to all the **117 Aspirational Districts spread over 28 States.**

---

50. Answer: a

Explanation:

The correct answer is Electrostatic forces.

⭐ Key Points

- The electrostatic force is the force between two charges it is also a central force because it acts along the line joining the centres of the two charges.
- It is also known as Columbian or electric force sometimes.

⭐ Additional Information

- Coulomb's law : When two charged particles of charges q_1 and q_2 are separated by a distance r from each other then the electrostatic force between them is directly proportional to the multiplication of charges of two particles and inversely proportional to the square of the distance between them.
  - Force (F) $\propto q_1 q_2$.
    $F = K \frac{q_1 \times q_2}{r^2}$
  - Where K is a constant = $9 \times 10^9 Nm^2/C^2$.

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51. **Answer: b**

Explanation:

Given:

Perimeter of the hexagon = 72 cm

Concept used:

Area of hexagon = $6\sqrt{3}a^2/4$

Calculation:

A hexagon has 6 sides, so the perimeter of the regular hexagon is '6a'

So, 6a = 72

a = 72/6 = 12 cm

Area = $6 \times 12^2 \times \sqrt{3}/4$

$\Rightarrow 6 \times 144 \times \sqrt{3}/4$

$\Rightarrow 6 \times 36 \times \sqrt{3}$

$\Rightarrow 216\sqrt{3}$

∴ The required area of the hexagon is $216\sqrt{3}$ cm^2

---

52. **Answer: a**

Explanation:

⭐ Shortcut Trick

- Letters in MEMORY = M, E, O, R, Y = letters in ROMEMY

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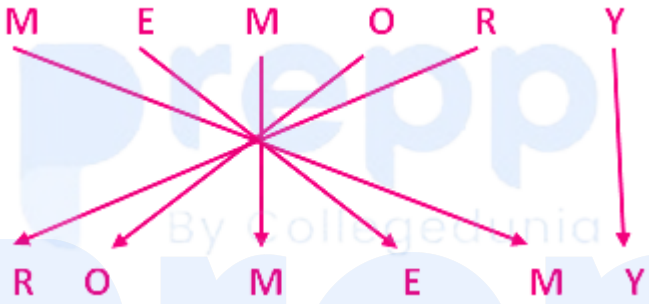
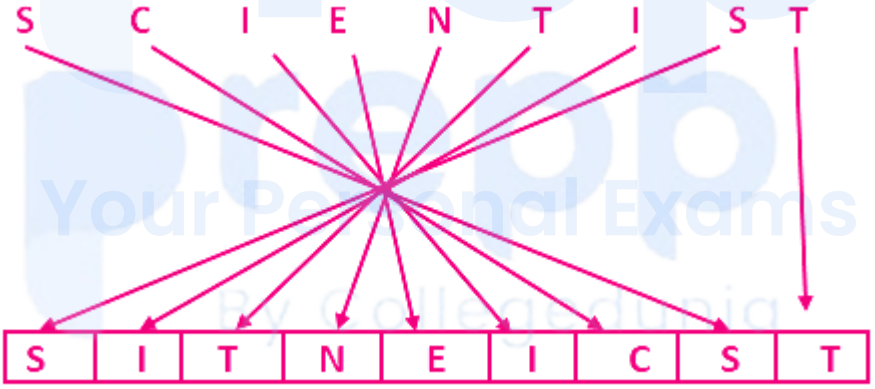
- Letters in SCIENTIST = S, C, I, E, N, T = letters in SITNEICST
  - Therefore, option 1 is the correct answer.
- Options 2, 3, and 4 are incorrect because
  - option 2 - SITNELGKL contains G
  - option 3 - ICSTISET does not contain N
  - option 4 - TENTVEGS contains V.

The logic followed here is:



Similarly,



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

---

53. Answer: c

Explanation:

The correct answer is **Panini**.

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⭐ Key Points

- Ashtadhyayi was composed by the Indian grammarian Panini during the 5th to 6th century BCE.
  - Ashtadhyayi sets working standards for the Sanskrit language.
  - It contains the essence of 4,000 sutras that developed into Vedic religion.
  - Panini divided his work into eight chapters, each of which is further divided into quarters.
  - Beyond defining the morphology and syntax of the Sanskrit language, Ashtadhyayi distinguishes between usage in spoken language and proper usage for the language of sacred texts.

⭐ Additional Information

- **Sushruta**
  - Sushruta was an ancient Indian surgeon known for his pioneering operations and techniques and for the influential treatise Sushruta-Samhita, the main source of knowledge about surgery in ancient India.
  - Charaka was one of the major contributors to Ayurveda, a system of medicine and lifestyle developed in ancient India.
- **Jaydev**
  - Jaidev was the **court poet of Bengal and the famous Sanskrit poet of the 12th century.**
  - He composed the book **Geet Govind** , an important text of the **Bhakti Movement**
  - It was composed in the 12th century.
- **Surdas**
  - Surdas was contemporary of **Akbar the renowned Mughal ruler.**
  - Surdas was a blind bard, who spent most of the time singing about Lord Krishna.

---

54. Answer: b

Explanation:

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The logic followed here is:-

- The circle moves in a 45° anticlockwise direction in each figure. The series of figures will be as follows:

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

---

55. Answer: a

Explanation:

The logic followed here is:-

- Singing and dancing are forms of art but singing and dancing are different from each other.

The most suitable Venn diagram is given below:

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

---

56. Answer: d

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Explanation:

The correct answer is **have zero acceleration**.

- **Average velocity is equal to the instantaneous velocity when acceleration is zero**.

⭐ **Important Points**

- **Average velocity**
  - The average velocity of a body is defined as the change in position or displacement divided by the time interval in which that displacement occurs.
  - Average velocity is a vector quantity.
  - The SI unit is meters per second.
- **Instantaneous velocity**
  - The instantaneous velocity is the specific rate of change of position (or displacement) with respect to time at a single point.
  - The SI unit of instantaneous velocity is m/s.
  - It is a vector quantity.

---

57. Answer: c

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Explanation:

The question asks whether the ***banyan tree*** that is ***standing in the middle of the road***, should be cut or not.

- Argument I is strong because if there is a tree in the middle of a road, it will ***cause problems to the traffic, which may also lead to accidents***. Additionally, it states that there is also a two-way project planned for the road, thus the ***tree will make it difficult for traffic flow as well as the project. Another tree can be planted along the sides of the road instead.***
- Argument II states that the tree should not be cut with the suggestion that the road can be narrowed by creating sections, or a signal can be installed. This

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justification weakens the argument since a narrow road will be more troublesome, especially for large vehicles, and it might become congested leading to traffic issues. Thus, argument II is not strong.

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

---

58. Answer: d

Explanation:

Given:

Present age of them = 52 years

Calculation:

Let Present age of younger cousin and elder cousin be a and b years respectively

⇒ a + b = 52 ----(1)

Also, 14 years ago,

⇒ (b – 14) = 3(a – 14)

⇒ b – 14 = 3a – 42

⇒ 3a – b = 28 ----(2)

Adding equation (1) and (2), we get

⇒ 4a = 80

⇒ a = 20

By equation (1), we have

⇒ 20 + b = 52

⇒ b = 32

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∴ Present age of elder cousin is 32 years

---

59. **Answer: a**

Explanation:

GIVEN:

Radius of cylinder = 6 cm

Height of cylinder = 9 cm

FORMULA USED:

Volume of cylinder = $\pi r^2 h$

The volume of sphere = $4/3\pi r^3$

CALCULATION:

volume of cylinder = $\pi \times 6 \times 6 \times 9 = 324\pi$ cm ^{3}

Let the radius of the Sphere be R cm,

then $(4/3)\pi R^3 = 324\pi$

$\Rightarrow R^3 = 243$

$\Rightarrow R^3 = 9 \times 3^3$

$\Rightarrow R\ 3 = 9^{(1/3)}\ 3$

$\Rightarrow R = 3\sqrt[3]{9}$ cm

∴ The radius of the Sphere is $3\sqrt[3]{9}$ cm

---

60. **Answer: c**

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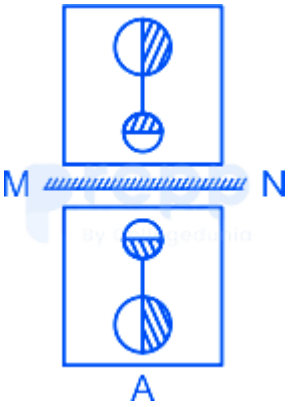
Explanation:

The correct water image of the question figure is as follows:



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

---

61. Answer: c

Explanation:

The correct answer is Kinetic energy.

- Water flowing at a hydroelectric power station can rotate a turbine because it contains Kinetic energy.
  - A turbine uses the flowing energy (kinetic energy) of the water to rotate the motor (mechanical energy) to generate electricity (electrical energy).

⭐ Key Points

- **Kinetic energy (KE):** The energy possessed by a body by virtue of its motion is called kinetic energy.
  - $KE = 1/2mv^2$
  - **where m = mass of the body and v = velocity of the body.**
- Hence, kinetic energy is directly proportional to the square of velocity.

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62. **Answer: c**

Explanation:

The logic followed here is:-

- 2, 7, 19, 31 are prime numbers.
- In option 3, 37 and 41 are prime numbers.

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

---

63. **Answer: d**

Explanation:

Given:

Sales in year 1 = Rs. 500000

Calculation:

35% = 7/20

Profit = 500000 × 7/20 = 175000

∴ The actual profit in year 3 is Rs. 175000

---

64. **Answer: a**

Explanation:

Given:

Price reduced by Rs. 2/kg

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Calculation:

Let the earlier price of sugar be Rs. X per kg

Quantity purchased is 16/x kg

After reducing quantity purchased = [16/(X – 2)]kg

$\Rightarrow 16/(X - 2) = 16/X + 4$

$\Rightarrow 16 \times X = (16 + 4)(X - 2)$

$\Rightarrow 16X = 16X + 4X^2 - 32 - 8x$

$\Rightarrow 4X^2 - 8X - 32 = 0$

$\Rightarrow X^2 - 2X - 8 = 0$

$\Rightarrow X^2 - 4X + 2X - 8 = 0$

$\Rightarrow X(X - 4) + 2(X - 4) = 0$

$\Rightarrow X = 4, -2$

$\Rightarrow X = 4$

∴ The price of sugar earlier Rs. 4/kg

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---

65. Answer: b

Explanation:

A regular tetrahedron is a tetrahedron in which **all four faces are equilateral triangles**

Without inverting it there are only faces

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∴ Option 2 is correct

---

66. **Answer: a**

Explanation:

The correct answer is **Permanent Settlement.**

⭐ **Key Points**

- **The system of Permanent settlement was introduced by Lord Cornwallis in Bengal, Bihar, and Orissa**.
  - The Permanent Settlement was introduced by Lord Cornwallis in 1793.
  - They created a class of hereditary landlords who became the permanent owners of their land.
  - They used to collect land revenue from the people and regularly deposit it in the government treasury.
  - The Permanent Settlement was an agreement between the Zamindars (zamindars) and the East India Company.
  - This settlement gave the primary owner of the land to the zamindars and fixed the amount of revenue payable to the company.

⭐ **Additional Information**

- **Ryotwari system**
  - He was the first **British Collector of Anantapur,** Andhra Pradesh.
  - He was known for **pro-farmer tax reforms.**

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    - He introduced the Ryotwari settlement system and was known as the **father of the Ryotwari settlement system.**
- **Izaredari system**
    - Izaredari system was introduced by Warren Hastings in 1773 in Bengal.
    - According to this land tenure (first in India), the right to collect revenue was auctioned to the highest bidder.
    - The peasants, merchants, and shopkeepers had to pay their rent to the Izaredar.
    - The system was eventually ended by the Permanent Settlement under the Cornwallis Code in 1793.
- **Mahalwari system**
    - In the **North-Western Provinces of the Bengal Presidency** (most of this area is now in Uttar Pradesh), an Englishman called **Holt Mackenzie devised the new system which came into effect in 1822.**
    - Under his directions, collectors went from village to village, inspecting the land, measuring the fields, and recording the customs and rights of different groups.
    - The estimated revenue of each plot within a village was added up to calculate the revenue that each village (mahal) had to pay. This demand was to be revised periodically, not permanently fixed.
    - The charge of collecting the revenue and paying it to the Company was given to the village headman, rather than the zamindar.

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---

67. Answer: b

Explanation:

The correct answer is Compression.

Concept:

Sound: It is a form of energy produced by vibration or disturbance that propagates in a medium.

- It travels in the form of longitudinal waves (Compression or rarefaction)

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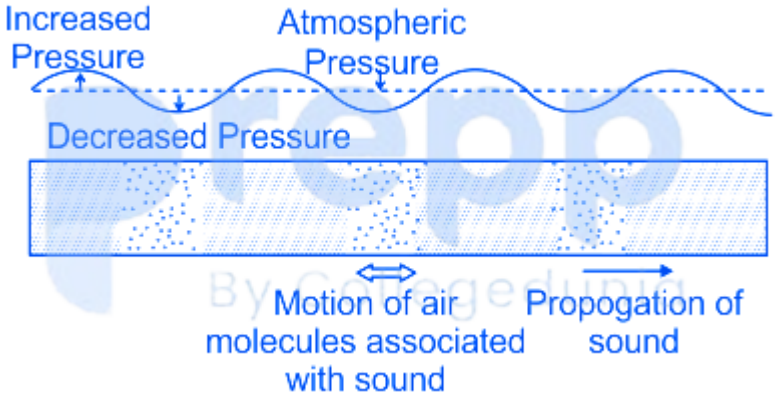

Explanation:

- Compression is the regions where pressure, as well as density, is high.
  - The region of high pressure and high density is called compression and the region of low pressure and low density in the air is called rarefaction.

⭐ Additional Information

Rarefaction	• Rarefaction is the reduction of an item's density, the opposite of compression. Like compression, which can travel in waves, rarefaction waves also exist in nature. • A common rarefaction wave is the area of low relative pressure following a shock wave.
Dimension	• In physics and mathematics, the dimension of a mathematical space is informally defined as the minimum number of coordinates needed to specify any point within it.
Ascent	• Ascent means upward movement.

---

68. **Answer: a**

Explanation:

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The correct answer is **20 J**.

CONCEPT:

- Electric potential difference : The amount of work done to move a unit charge from a point to another point in a space where an electric field is present is called an electric potential difference .

$$\text{Potential difference (V)} = \frac{Work\ done(W)}{Charge(Q)}$$

Work done (W) = Energy gained = Q V

- Electric field : The space or region around the electric charge in which electrostatic force can be experienced by other charged particles is called an electric field by that charge.

CALCULATION:

- Find work done = W

Given:

- Moving charge (Q) = 0.5 C
- Two points having a potential difference (V) = 40 V.

We know that

$$Potential\ \ difference = \frac{Work\ done}{Quantity\ of\ charge\ moved}$$

- Work done = Q × V
- Work done = 0.5 × 40
- Work done = 20 J.

---

69. **Answer: a**

Explanation:

The correct answer is **Fullerene**.

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⭐ Key Points

- Fullerene
  - It is formed when vaporized carbon condenses in an inert gas atmosphere.
  - It was discovered by Richard Smalley in **1985.**
  - A form of carbon having a large spheroidal molecule consisting of a hollow cage of sixty or more atoms, of which buckminsterfullerene was the first known example.
  - Fullerenes are produced chiefly by the action of arc discharge **between carbon electrodes in an inert atmosphere.**
  - **Harold Kroto, Robert Curl, and Richard Smalley** were given the Nobel prize in chemistry in 1996, for the discovery of this carbon allotrope, fullerene C60.

⭐ Additional Information

- Graphite
  - It is an allotrope of carbon used both as a lubricant and as a lead in pencils.
- Carbon Black
  - Carbon black is obtained by burning hydrocarbons in a limited supply of air.

    $CH_4 + O_2\ C + 2H_20$
  - It is used as a black pigment in black ink.
  - It is also used as a filler in automobile tyres.
  - **Heating wood at high temperature in absence of air** releases charcoal and volatile tars.
  - **Heating coal at a high temperature in absence of air** results in the destructive distillation of coal.
  - **Heating coal at a high temperature** in the presence of air would produce Carbon dioxide.
- Coke
  - **Coke is produced by heating coal for several hours to high temperature out of contact with air until all volatile matters are removed.**
  - The process is called "carbonization" or "Destructive distillation of coal".

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70. **Answer: a**

Explanation:

The correct answer is **1951**

⭐ **Key Points**

- **The first Asian Games were held in New Delhi, India in 1951**.
  - They are also known as **Asiad.**
  - It is a **Pancontinental multi-sport level** even held every four years among athletes from all over Asia.
  - The games are regulated by the **Asian Games Federation.**
  - The motto of the first Asian Games was the game is "**Play the game in the spirit of the game**".
  - The Games were officially opened by Indian President Rajendra Prasad at the **Major Dhyan Chand National Stadium.**

⭐ **Additional Information**

Edition	Year	Host City	Host country
XVII	2014	Incheon	South Korea
XVIII	2018	Jakarta-Palembang	Indonesia
XIX	2022	Hangzhou	China
XX	2026	Aichi-Nagoya	Japan
XXI	2030	Doha	Qatar
XXII	2034	Riyadh	Saudi Arabia

71. **Answer: d**

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Explanation:

The correct answer is **Power.**

⭐ **Key Points**

- **The SI unit of power is joule/second or Watt**.
- Power: It is defined as the rate of doing work.
- $P = \frac{W}{t} = F \times v$
  Where,
  - W = work,
  - t = time,
  - F = force,
  - and V = average velocity.
- Electric power is the rate, per unit time, at which electrical energy is transferred by an electric circuit (P=W/t).
- Therefore, it is measured in Joules/ second or Watts which is the SI unit for power.

⭐ **Additional Information**

- **Thrust**
  - When any object is put into the water then the object will replace the water the same as its volume and the cause of which there is a force acting upwards, to balance this weight is called the **thrust force.**
  - The SI unit of thrust is **Newton.**
- **Force**
  - **The interaction which after applying on a body changes or try to change the state of motion or state of rest is called force.**
  - Force is denoted by F and the SI unit is Newton (N).
  - **Force (F) = Mass (m) x acceleration (a).**

---

72. Answer: d

Explanation:

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The correct answer is **Chorine and Sodium Hydroxide.**

- **Chlorine & Sodium Hydroxide are produced in the Chlor-alkali process**.

⭐ **Key Points**

- When the electricity is passed through the aqueous solution of 10% NaCl (brine) then it decomposes to form sodium hydroxide, a basic compound.
  - This process is called the **chloralkali process.**
    $2NaCl\ (aq) + 2H_2O \rightarrow 2NaOH\ (aq) + Cl_2\ (g) + H_2\ (g)$
  - **The three products in this reaction come are:**
    - Sodium hydroxide (NaOH).
    - Chlorine (Cl).
    - Hydrogen (H_2).

---

73. Answer: a

Explanation:

Total revenue is 35 lakhs

Revenue from sale of donuts is 20% = 1/5

Revenue = 35 × 1/5 = 7 lakhs

∴ Required answer is 7 lakhs

---

74. Answer: d

Explanation:

Given:

L.C.M. of two numbers 48 and 176 = 4 × m

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Concept used:

HCF: Product of the smallest power of each common prime factor in the numbers.

LCM: Product of the greatest power of each prime factor, involved in the numbers

Calculation:

$48 = 4^2 \times 3$

$176 = 4^2 \times 11$

$LCM = 4^2 \times 3 \times 11 = 4m$

$\Rightarrow 4(4 \times 3 \times 11) = 4m$

$\Rightarrow m = 4 \times 3 \times 11 = 132$

∴ The value of m is 132

---

75. Answer: b

Explanation:

I. X is to the northwest of Z.

- Here, there is no information given about the direction of Y. Therefore, statement 1 alone is not sufficient.

II. X is to the north of M who is to the west of Z.

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- No information is given about the direction of Y. Therefore, statement 2 alone is not sufficient.

III. M is to the northwest of Y.

- No information is given about the direction of X. Therefore, statement 3 alone is not sufficient.
- From statements 2, and 3:-

- Here, we can see that X is to the north-west of Y. Therefore, statements 2, and 3 together are sufficient.

Hence, "option 2" is the correct answer.

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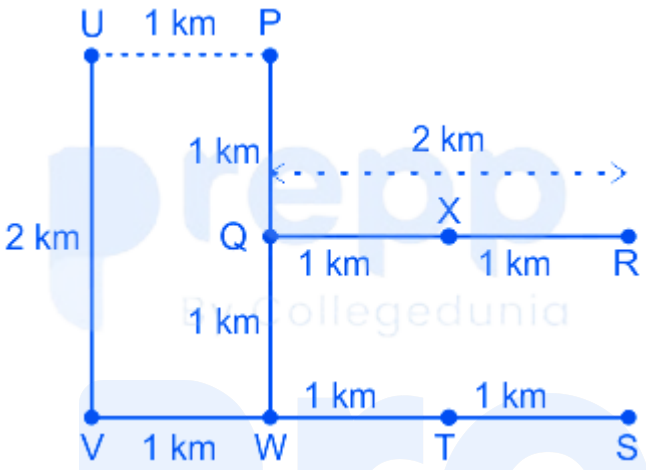
76. **Answer: c**

Explanation:

- The distance diagram is as follows:



- The distance between P and U is 1 km

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

---

77. **Answer: c**

Explanation:

Given:

4 km upstream in 5 hours

16 km upstream in 5 hours

Concept used:

Upstream = v - u

Downstream = v + u

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v = Speed of the man

u = speed of the stream

Calculation:

We know that,

Speed = Distance/Time

16 km downstream in 5 hours

v + u = 16/5 ----(1)

4 km upstream in 5 hours

v - u = 4/5 ----(2)

From eq 1 and eq 2

2v = 20/5 = 4 km/h

⇒ v = 2 km/h

⇒ u = 1.2 km/h

∴ T he speed of the stream is 1.2 km/h

---

78. Answer: b

Explanation:

The correct answer is CryptoCurrency offering.

- Unregulated means of raising funds for projects using cryptocurrencies such as Bitcoin, D.A.S.H., Ethereum, Monero, Litecoin, and Z-cash have been named Crypto Currency Offering.

⭐ Additional Information

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- **Bitcoin**, first released as open-source software in **2009**, is the first decentralized **cryptocurrency.** Since the release of bitcoin, many other cryptocurrencies have been created.
    - In **1983**, the **American cryptographer David Chaum** conceived an anonymous cryptographic electronic money called **ecash.**
    - In **1998**, Wei Dai published a description of **b-money**, characterized as an anonymous, distributed electronic cash system.
    - In **June 2021, El Salvador** became the first country to accept **Bitcoin** as legal tender.

⭐ Important Points

- **Initial, Coin Offering:**
    - An initial coin offering or initial currency offering is a type of funding using cryptocurrencies. This is often a form of crowdfunding, although a private ICO that does not seek public investment is also possible.
- **Digi Coin Offering:**
    - Digital currency (digital money, electronic money, or electronic currency) is any currency, money, or money-like asset that is primarily managed, stored, or exchanged on digital computer systems, especially over the internet.
    - Types of digital currencies include cryptocurrency, virtual currency, and central bank digital currency.

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79. Answer: d

Explanation:

The correct answer is Karnataka.

⭐ Key Points

- The Karnataka government and Congress Vice President Rahul Gandhi have started 'Indira Canteen' in Bengaluru with an aim to reach out to the poorer sections of the society.

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- Breakfast in the canteen will be Rs 5 and lunch and dinner at Rs 10 per plate.
- Out of the total proposed 198 canteens, 101 were started on 16th August 2017 and the rest will start functioning from 2nd October 2017.

---

80. Answer: a

Explanation:

Given:

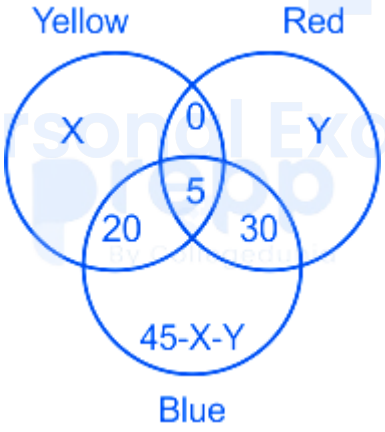
Total no. of children = 100

No. of children who like blue and red = 30

No. of children who like yellow and blue = 20.

No. of children who like only one colour = 45.

The Venn diagram representation of the given information is as follows:



- No. of children who like only red or only yellow or only blue = 45
- Here, X likes only yellow; Y likes only red
- So, no. of children who like only blue = 45 - (X + Y) = 45 - X - Y

- Children who like all three colours = 100 - 45 - 20 - 30 = 100 - 95 = 5
- Thus, 5 children like all three colours.

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

---

81. Answer: a

Explanation:

Given:

0.92 – 0.126 ÷ 0.6 + 6.7 × 0.03

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:

0.92 – 0.126 ÷ 0.6 + 6.7 × 0.03

⇒ 0.92 – 0.126 × 1/0.6 + 6.7 × 0.03

⇒ 0.92 – 0.21 + 6.7 × 0.03

⇒ 0.92 – 0.21 + 0.201

⇒ 0.911

∴ Requried answer is 0.911

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82. **Answer: d**

Explanation:

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

The logic followed here is:

- Option A → E and its positional value 5.
- Option B → O and 14, but its positional value is 15.
- Option C → T and its positional value 20.
- Option D → Y and its positional value 25.

So, option B is different from others.

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

---

83. **Answer: b**

Explanation:

- There are three shapes given to us.

- When we combine 2) and 3) we get the following figure:

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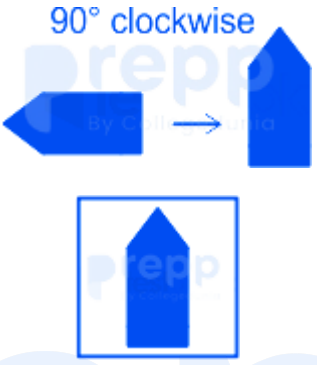
- When we add 1) to the above shape, we get

- After rotation, we get:



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

⭐ Mistake Points

Option 3 is incorrect because, the thickness of the shape 3) does not match with the given question figure.

---

84. Answer: d

Explanation:

The correct answer is Echinodermata.

⭐ Key Points

- Echinodermata are exclusively free-living marine animals.
  - Echinodermata is a **phylum** of sea invertebrates.

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- They have fivefold **radial symmetry, a calcareous skeleton, and tube feet** operated by fluid pressure.
- Examples are **sea cucumbers, starfishes, sea urchins, brittle stars, and crinoids.**

⭐ Additional Information

Animals	Description
Arthropoda	They are those invertebrates, which breath through the trachea and book lungs. Examples are **butterflies, cockroaches, tarantula, lobster, etc.**
Mollusca	They are invertebrates with three main body parts i.e. the foot, the visceral mass, and the mantle. Examples are **oysters, limpets, octopus, chiton, etc.**
Nematoda	They are microscopic worms that live in the soil. Examples are **filariasis, hookworms, pinworms, etc.**

---

85. **Answer: b**

Explanation:

Formula used:

$S_n = (n/2)[2a_1 + (n - 1)d]$

Where,

S n = sum of terms, n = numbers of terms, a_1 = first term, d = common difference

Calculation:

The series of first 200 whole numbers is 0, 1, 2...,199

$a_1 = 0$, n = 200,

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Common difference = 1 - 0 = 1

S n = (n/2)[2a 1 + (n - 1)d]

S_n = (200/2)[2 × 0 + (200 - 1)1]

⇒ S_n = 100[199]

⇒ S_n = 100 × 199 = 19900

∴ **The required answer is 19900.**

---

86. Answer: c

Explanation:

The correct answer is **Rajasthan**.

⭐ **Key Points**

- **Desert National Park, Rajasthan**
  - Desert National Park, Rajasthan, India, is situated in the west Indian state of Rajasthan near the towns of **Jaisalmer and Barmer.**
  - The Desert National Park is an excellent example of the ecosystem of the Thar Desert.
  - The DNP is the most important site for the long-term survival of the **Globally Threatened Great Indian Bustard**.

⭐ **Additional Information**

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States	National park
Assam	Kaziranga National Park, Dibru-Saikhowa National Park, Manas National Park, Nameri National Park, Orang National Park, Raimona Reserve Forest, Dehing Patkai National Park
Gujarat	Gir Forest National Park, Blackbuck National Park, Marine National Park, Gulf of Kutch
Kerala	Pambadum Shola National Park, Eravikulam National Park, Mathikettan Shola National Park, Silent Valley National Park, Anamudi Shola National Park, Periyar National Park
Rajasthan	Keoladeo National Park, Sariska National Park, Ranthambore National Park, Mukundra Hills (Darrah) National Park, Desert National Park

87. **Answer: b**

Explanation:

Given:

Neelu cuts 2 kg of yarn in 12 days working 3 hours a day

Concept used:

$W_2 \times D_1 \times T_1 = W_1 \times D_2 \times T_2$

W = work

D = Days

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T = Time

Calculation:

According to the concept,

$W_2 \times D_1 \times T_1 = W_1 \times D_2 \times T_2$

$10 \times 12 \times 3 = 2 \times D_2 \times 4$

$\Rightarrow 5 \times 3 \times 3 = D_2$

$\Rightarrow D_2 = 45$

∴ Required time is 45 days

---

88. **Answer: d**

Explanation:

Given:

4 years ago Mitesh's age was twice that of Pranav.

11 years ago Mitesh's age was thrice that of Pranav.

Calculation:

Let age of Mitesh 4 years ago be 2x

So, age of Pranav be x

According to the question,

$(2x - 7)/(x - 7) = 3/1$

$\Rightarrow 2x - 7 = 3x - 21$

$\Rightarrow x = 14$

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So, age of Mitesh 4 years ago = 28

Present age of Mitesh = 28 + 4 = 32 years

∴ **Present age of Mitesh is 32 years**

---

89. Answer: a

Explanation:

The correct answer is **Poet, Author, and activist**.

⭐ **Key Points**

- **Ilavenil Meena Kandasamy is an Indian poet, fiction writer, translator, and activist from Chennai, Tamil Nadu**.
  - Meena published two collections of poetry, Touch (2006) and Miss Militancy (2010).
  - From 2001-2002, she edited The Dalit, the bi-monthly alternative English magazine of the Dalit Media Network.
  - She represented India in the International Writing Program of the University of Iowa and was a Charles Wallace India Trust Fellow at the University of Kent, Canterbury, United Kingdom.
  - She writes columns for platforms like Outlook India and The Hindu.

---

90. Answer: b

Explanation:

The correct answer is **Warren Hastings**.

⭐ **Key Points**

- **Izaredari system was introduced by Warren Hastings in 1773 in Bengal**.

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- There was a frequent change in the assessment period and **no fixed revenue** generation.

⭐ Important Points

- According to this land tenure (first in India), the right to collect revenue was auctioned to the highest bidder.
  - The peasants, merchants, and shopkeepers had to pay their rent to the Izaredar.
  - The system was eventually ended by the **Permanent Settlement under the Cornwallis Code in 1793** .

---

91. Answer: a

Explanation:

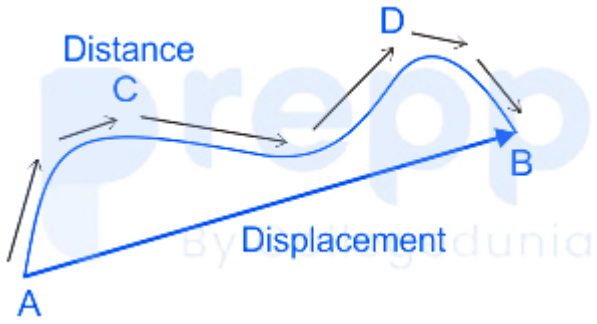
The correct answer is **Meter**.

⭐ Key Points

- **The SI unit of displacement is meter (m).**
  - Displacement is a **vector quantity** .
  - It can be positive, negative, or zero.

⭐ Important Points

- **Displacement (S")** :
  - The minimum path length between starting point to the final point is called displacement.



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92. **Answer: a**

Explanation:

Calculation:

Let $f(x)$ be $4x^6 - 5x^3 - 3$

$\Rightarrow f(x) = 4 \times (x^3)^2 - 5x^3 - 3$

Now, $x^3 - 2 = 0$

$\Rightarrow x^3 = 2$

Putting $x^3 = 2$ in $f(x)$ we get $4 \times 2^2 - 5 \times 2 - 3$

$\Rightarrow 16 - 10 - 3$

$\Rightarrow 3$

∴ Required remainder is 3

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93. **Answer: a**

Explanation:

The logic followed here is:-

Petty is the antonym of serious.

Similarly,

Yell is the antonym of whisper.

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

⭐ Additional Information

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- Petty - not very important or serious
- Yell - scream or shout.

---

94. Answer: d

Explanation:

The correct answer is**Caesium**.

⭐ Key Points

- Caesium element has the lowest ionization energy.
  - As we go from Lithium to Cesium down the group, Ionisation potential decreases. It is easiest to withdraw an electron from Cs metal.

⭐ Additional Information

Trends in the periodic table:

Along the period (horizontally):

- Along with the group, electrons keep adding in the same shell. Increased nuclear charge and number of electrons lead to a greater force of attraction between the nucleus and outermost electrons.
- Hence it requires more energy to remove the electrons from the outermost shell.
- Therefore ionization energy increases along the period.

Down the group (vertically):

- Down the group, the electrons start getting placed in the higher energy shells. The distance between the outermost electrons and the nucleus increases and the force of attraction between them decreases.
- Owing to the easier removal of electrons from the outermost shell, the ionization energy decreases down the group.
- From the above it is clear that elements having lower period numbers and the higher group number will have higher ionization energy.

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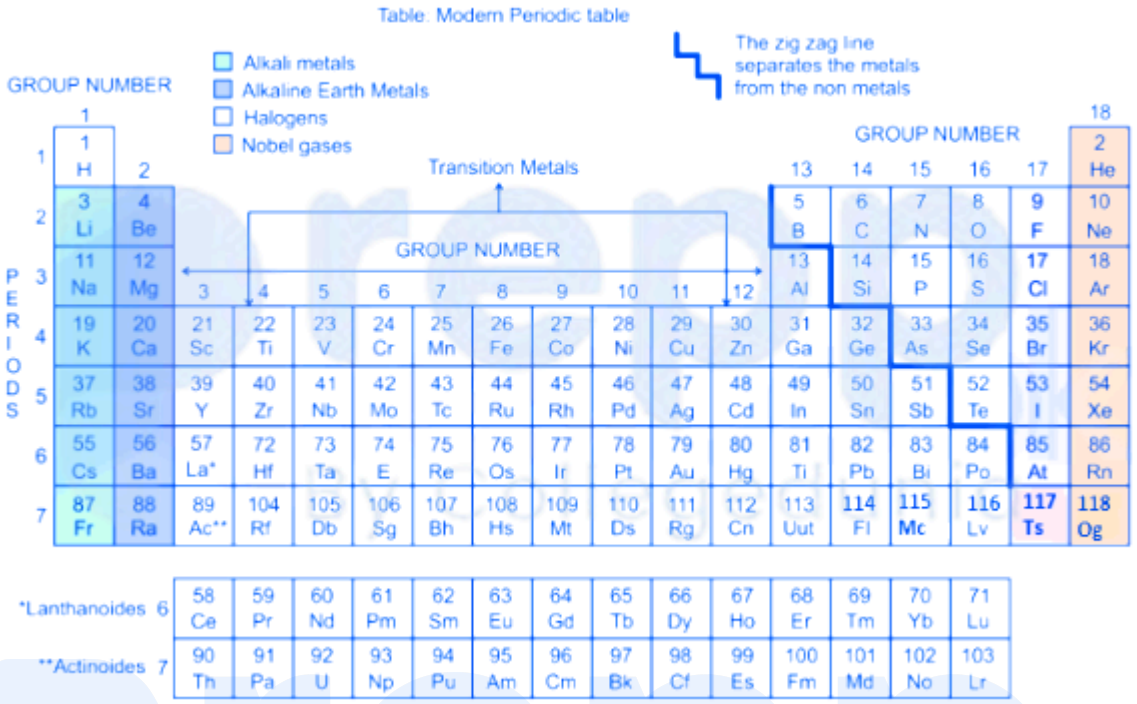

- Lithium, Sodium, Potassium, and Cesium all belong to the alkaline metals group I.
- As we go down the group 1 - A, the atomic radii increase which leads to a decrease in ionization potential.

⭐ **Mistake Points**

- The Francium is below the caesium
- Fr is a special case of alkali metals as it is the first to have a set of occupied f-orbitals. so it doesn't have the lowest ionisation energy
- The more electrons shielding the outer electron shell from the nucleus, the less energy is required to expel an electron from a said atom.

---

95. Answer: d

Explanation:

1. P is heavier than S and V is lighter than S.

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P > S > V

- Here, there is no information given about the weights of Q and W. Therefore, statement 1 alone is not sufficient.

2. Q is heavier than P and W is lighter than V.

Q > P, W < V

- No information is given about the weight of S. Therefore, statement 2 alone is not sufficient.
- From statements 1, and 2:-

Q > P > S > V > W . So, S is in the middle.

- Here, statements 1, and 2 together are sufficient.

Hence, "option 4" is the correct answer.

---

96. **Answer: a**

Explanation:

The correct answer is **66 mm × 150 mm**.

⭐ **Key Points**

- **The new Rs. 500 currency note has the dimensions of 150 mm x 66 mm**.
  - Width - 150 mm
  - Height - 66 mm
  - It has the portrait of **Mahatma Gandhi on the obverse side whereas the motif of Red Fort is present on the reverse side of the note along with a logo and tagline of Swachh Bharat Abhiyan.**
  - It is **stone-grey** in colour.

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97. **Answer: c**

Explanation:

The correct answer is **a cycle of contraction and relaxation of the heart**.

- **The Cardiac cycle is a cycle of contraction and relaxation of the heart.**

⭐ **Key Points**

- **Cardiac cycle** -
  - The sequential event in the heart which is cyclically repeated is called the cardiac cycle consists of systole and diastole of both the atria and ventricles.
  - To begin with, all the four chambers of the heart are in a relaxed state, i.e., they are in joint diastole.

⭐ **Additional Information**

- **Events in the cardiac cycle-**
  - The SAN generates an action potential that stimulates both the atria to undergo a simultaneous contraction - the atrial systole or auricular systole.
  - This increases the flow of blood into the ventricles by about 30 percent.
  - The action potential is conducted to the ventricular side by the AVN and AV bundle from where the bundle of His transmits it through the entire ventricular musculature.
  - This causes the ventricular muscles to contract, (ventricular systole).
  - The atria undergo relaxation (diastole), coinciding with the ventricular systole.
  - **The duration of the cardiac cycle in a healthy man is 0.8 seconds.**

---

98. **Answer: b**

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Explanation:

Given:

Share of Urmi = Rs. 11250

Share of Lokesh = Rs. 13125

Concept used:

Profit sharing ratio = Investment of shareholders × time

Calculation:

Profit share ratio = 11250 × 12 : 13125 × 8

⇒ 33750 : 26250

⇒ 9 : 7

∴ **The profit of the first 12 months be divided between both of them in 9 : 7**

---

99. Answer: a

Explanation:

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The correct answer is Atomic number.

⭐ Key Points

- **The number of electrons present in an atom of an element is equal to its Atomic number.**
- **Atomic number:**
  - The total number of protons in the nucleus of an atom is known as the atomic number
  - It is denoted by Z.
  - Since the number of electrons and protons are the same in an atom, atomic number also corresponds to the number of electrons in an atom

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but not in the case of ions as in ions, the number of electrons is either more or less than the element.

- Let's take the example, the atomic number of sodium is 11 so there are 11 protons in its nucleus.
- A mass number of an atom is the integer closest to the nuclear mass.

---

100. Answer: c

Explanation:

The completed figure is given below:-

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

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