



Your Personal Exams Guide



NDA



CDS



SSC CGL



CBSE UGC NET



IAS



SSC CHSL



CTET



MPSC



AFCAT



CSIR UDC NET



IBPS PO



UP POLICE



SSC MTS



SBI PO



BPSC



UP TET



IBPS RRB



IBPS CLERK



IES



UPSC CAPF



SSC Stenogr..



RRB NTPC



SSC GD



RBI GRADE B



RBI Assistant



DSSSB

RRB Group D 2018 Previous Year Paper (15-Oct-2018) (Shift 2)

Total Time: 1 Hour : 30 Minute

Total Marks: 100

Instructions

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

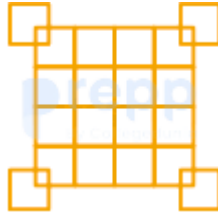
- 1.) A total of 90 minutes is allotted for the examination.
- 2.) The server will set your clock for you. In the top right corner of your screen, a countdown timer will display the remaining time for you to complete the exam. Once the timer reaches zero, the examination will end automatically. The paper need not be submitted when your timer reaches zero.
- 3.) There will, however, be sectional timing for this exam. You will have to complete each section within the specified time limit. Before moving on to the next section, you must complete the current one within the time limits.

Your Personal Exams Guide

CBT

1. Count the number of squares in the following figure:

(+1, -0.33)



- a. 36
- b. 38
- c. 42
- d. 40

2. Which of the following national political parties have the clock as its party symbol ?

(+1, -0.33)

- a. All India Trinamool Congress
- b. Indian National congress
- c. Nationalist Congress Party
- d. Bahujan Samaj Party

3. Which of the following statements is/are true of the speed of sound in different media at 25°C?

(+1, -0.33)

- A. In Aluminium, the speed of sound is 6220 m/s.
- B. In Nickel speed of sound 6040 m/s.

- a. Only B is true
 - b. Both A and B are true
 - c. Only A is true
 - d. Neither A nor B is true
-

4. Which of the phenomena mentioned in the options is NOT explained by the universal law of gravitation? (+1, -0.33)

- a. The motion of the moon around the earth
 - b. The tides are due to the moon and the sun
 - c. The force that binds us to the earth
 - d. The motion of sun around the planets
-

5. Which of the following metals can form an amphoteric oxide? (+1, -0.33)

- a. Al
 - b. Cu
 - c. Ca
 - d. Na
-

6. India is divided into _____ physiological regions. (+1, -0.33)

- a. 6
- b. 7

c. 4

d. 5

7. Find the energy possessed by an object of mass 14 kg when it is at a height of 5 m above the ground Given $g = 9.8 \text{ ms}^{-2}$ (+1, -0.33)

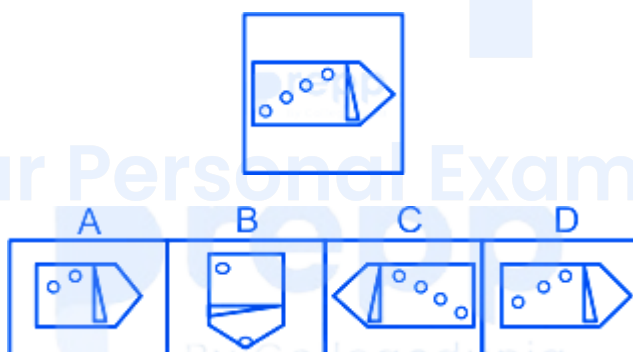
a. 528 J

b. 668 J

c. 686 m

d. 686 J

8. Which of the options bears the closest resemblance to the following figure? (+1, -0.33)



a. C

b. B

c. D

d. A

9. A tank has two inlets and an outlet. The inlets fill up the tank in 6 hours and 8 hours individually and outlet empties it in 10 hours. If the inlets are opened for an hour and closed and then all the three taps are opened together, how much time will it take to fill up remaining tank? (+1, -0.33)

- a. $75/23$ hours
- b. $72/23$ hours
- c. $85/23$ hours
- d. $82/23$ hours

10. Raju has Rs. 210 in the form of coins, 20% of the coins are in Rs. 5, 25% in Rs. 10, 15% in Rs. 2 and the remaining ones in Rs. 1 denominations. Find the number of Rs. 1 coins. (+1, -0.33)

- a. 20
- b. 25
- c. 22
- d. 24

11. _____ was the court poet of Harshavardhana. (+1, -0.33)

- a. Bilhana
- b. Jayadeva
- c. Chand Bardai
- d. Banabhatta

12. King Ashoka was the son of _____ who belonged to the Maurya dynasty. (+1, -0.33)

- a. Bimbisara
- b. Chandragupta Maurya
- c. Chandragupta II
- d. Bindusara

13. The LCM of 94, 188 and 235 is: (+1, -0.33)

- a. 705
- b. 1880
- c. 940
- d. 470

14. Choose the mirror image for the following figure: (+1, -0.33)



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

d. D

15. Find the next figures for the given series

(+1, -0.33)



16. Find the median of the given data set:

(+1, -0.33)

42, 45, 58, 87, 45, 54, 65, 12, 25, 25, 59, 60

a. 49.5

b. 59.5

c. 54

d. 45

17. Ratio of ages of father and son is 3 : 1. The product of their ages is 147. (+1, -0.33)
What is the sum of their ages?

a. 32

b. 36

c. 28

d. 35

18. Travelling at 66 km/h, Piyali reaches a place 5 minutes early. If she travelled at 54 km/h, she would have been 3 minutes late. What is the distance Piyali had to travel? (+1, -0.33)

a. 39.2 km

b. 40.2 km

c. 39.6 km

d. 40.8 km

19. Find the next letter in the series: (+1, -0.33)

F, J, I, M, L, P, ?

a. V

b. S

c. O

d. T

20. In the nineteenth century, _____ came up with the idea of evolution of species by natural selection. (+1, -0.33)

a. Johann Mendel

b. Johann Dobereiner

c. John Dalton

d. Charles Darwin

21. Rajan can finish a certain task in 6 days. Bhavesh takes 8 days to complete the same task. Charan takes as long as Rajan and Bhavesh would take working together. How long will it take Bhavesh and Charan to complete the work together? (+1, -0.33)

a. $2\frac{2}{5}$ days

b. $2\frac{7}{5}$ days

c. $2\frac{3}{5}$ days

d. $2\frac{4}{5}$ days

22. Who is the Chief Minister of Sikkim as of August 2018? (+1, -0.33)

a. Biplab Deb

b. Pavan Kumar Chamling

- c. Conrad Sangma
 - d. Manik Sarkar
-

23. The rate of doing work or the rate of transfer of energy is called _____. (+1, -0.33)

- a. Force
 - b. Work done
 - c. Momentum
 - d. Power
-

24. Name the young CEO of the South India-based idli batter company ID Special Foods Pvt. Ltd. who was recently invited to address the students of Harvard University. (+1, -0.33)

- a. Anand Sattanathan
 - b. Sunny Varkey
 - c. PC Mustafa
 - d. RC Subramoniam
-

25. An elevator descends into a mine shaft at the rate of 7.5 m/minute. If it descends from 35 m above the ground, how long will it take to reach the mine that is 430 m below ground? (+1, -0.33)

- a. 57.33 Minutes
- b. 66 Minutes

- c. 62 Minutes
 - d. 52.67 Minutes
-

26. 1 Joule = _____ (+1, -0.33)

- a. $1 \text{ N} \times 1 \text{ cm}$
 - b. $1 \text{ Pa} \times 1 \text{ m}$
 - c. $1 \text{ W} \times 1 \text{ m}$
 - d. $1 \text{ N} \times 1 \text{ m}$
-

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

Statement: "I would like to do survey on the healthiest breakfast available in India" X says to Y.

Assumptions:

- I. The healthiest breakfast in India can be found out with a survey
- II. X possess skills and competencies to do such survey.

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

28. Which of the conclusions can be concluded on the basis of given statements? (+1, -0.33)

Statements:

1. Some autos are scooters.
2. All scooters are cycles.

Conclusions:

- I. Some autos are cycles.
- II. No scooter is auto.

- a. Both I and II follow
- b. Only I follows
- c. Either I or II follows
- d. Only II follows

29. Which of the following is the smallest fraction? (+1, -0.33)

$$\frac{3}{15}, \frac{5}{20}, \frac{8}{64}, \frac{25}{1000}$$

- a. $\frac{3}{15}$
- b. $\frac{5}{20}$
- c. $\frac{25}{1000}$
- d. $\frac{8}{64}$

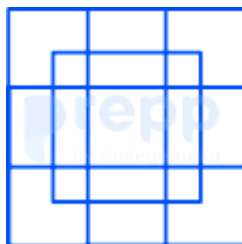
30. Four words have been given below of which three are alike in some way and one is different. Choose the **odd one out**. (+1, -0.33)

- a. Oxygen
- b. Platinum
- c. Silver
- d. Gold

31. A can do a work in 12 days and B can do it in 18 days. They started working together, but A leaves 3 days before the work gets over. For how many days did the two work together? (+1, -0.33)

- a. 6
- b. 5
- c. 7
- d. 7.2

32. Find the number of squares in the figure (+1, -0.33)



- a. 24
- b. 25

c. 19

d. 23

33. The difference between a positive fraction and its reciprocal is $6\frac{39}{160}$. What is the fraction under consideration? (+1, -0.33)

a. $15/8$

b. $16/5$

c. $32/5$

d. $13/8$

34. $2/9$ the people in a restaurant are adults. If there are 65 more children than adults, then how many children are there in the restaurant? (+1, -0.33)

a. 91

b. 81

c. 117

d. 26

35. Consider the following question and decide whether the statements are sufficient to answer the question. (+1, -0.33)

Question:

In a box, there are packets of three different sizes. How many packets are there in the box?

Statements:

1. Half of all the packets are of medium size.
 2. There are six big packets.
 3. There are twice the amount of small packets than there are big packets.
- a. Statement 1 and 3 are sufficient
 - b. Statement 1, 2 and 3 together are sufficient
 - c. None of the statement are sufficient
 - d. Statement 1 and 2 are sufficient

36. Find the next figure for the given series:

(+1, -0.33)

Problem figures:



Answer figures:



A

B

C

D

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

37. Which of the following states hosted the 7th edition of the Rashtriya Sanskriti Mahotsav (RSM)? (+1, -0.33)
- a. Kerala
 - b. Karnataka
 - c. Tamil Nadu
 - d. Andhra Pradesh
-

38. Modern periodic table has: (+1, -0.33)
- a. 18 groups and 7 periods
 - b. 8 periods 7 groups
 - c. 7 periods 8 groups
 - d. 7 groups and 18 periods
-

39. During uniform motion of an object along a straight line, its _____ remains constant with time. (+1, -0.33)
- a. acceleration
 - b. deceleration
 - c. force
 - d. velocity
-

40. _____ is the transition of a substance directly from the solid to the gas phase without passing through the intermediate liquid phase. (+1, -0.33)

- a. Sublimation
- b. Evaporation
- c. Condensation
- d. Liquidation

41. A soldier is walking in North direction for 2 km, then he turns left and walks for 3 km and then turns left and continues walking. Which direction is he walking now? (+1, -0.33)

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

42. A man takes leave on every first Friday of the month. His official leave is on Sunday. There is no other holidays. On which date of the year 2017, 17th holiday will be? (+1, -0.33)

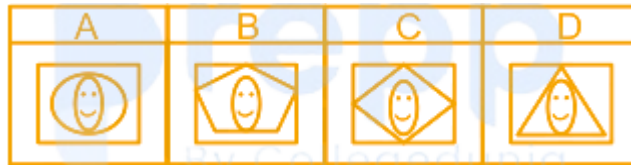
Note: Consider 1st January 2017 is Monday.

- a. 31st March 2017
- b. 6th April 2017
- c. 7th April 2017

d. 1st April 2017

43. Find the odd one out:

(+1, -0.33)



a. B

b. A

c. D

d. C

44. What denotes offering several products for sale as one combined product?

(+1, -0.33)

a. Advertisement

b. Product mix

c. Product bundling

d. Differentiation

45. Cutaneous respiration takes place in -

(+1, -0.33)

a. Earthworm

b. Fish

c. Man

d. Birds

46. Each question given below consists of a statement, followed by two arguments numbered I and II. You have to decide which of the arguments is a 'strong' argument. (+1, -0.33)

Statement: Should education be made free for children till 14 years of age?

Arguments:

I. Yes, this will help to stop forced child labour in the country.

II. No, free things does not carry a value.

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

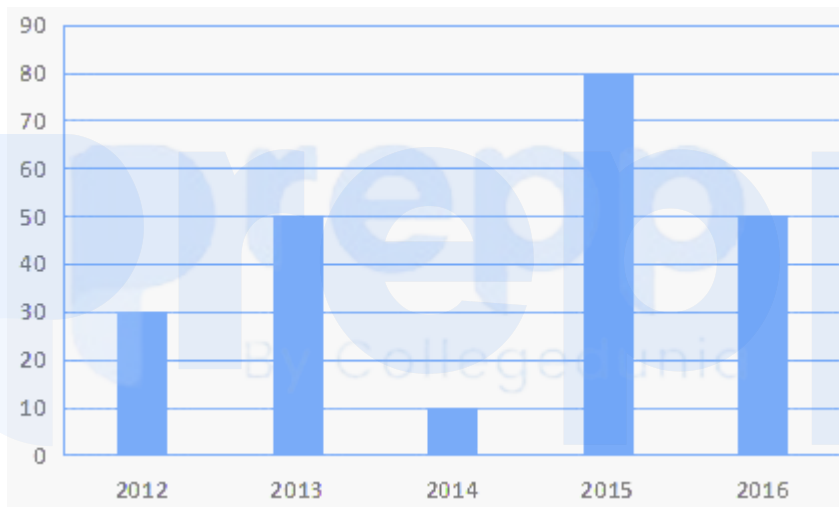
47. How is Rajan's father's only brother's father related to Rajan? (+1, -0.33)

- a. Paternal Grandfather
 - b. Son
 - c. Father
 - d. Uncle
-

48. Which of the following persons has not served as the Chief Minister of Uttar Pradesh? (+1, -0.33)

- a. N. D. Tiwari
- b. Govind Ballabh Pant
- c. Sarojini Naidu
- d. Chandra Bhanu Gupta

49. The following Bar graph shows information of the results in the national level entrance exam by the institute "ABC" for the last 5 years. (+1, -0.33)



In the year 2015, how many ranks were scored from institute ABC

- a. 90
- b. 80
- c. 60
- d. 70

50. What is the change in velocity / Time taken = ? (+1, -0.33)

- a. Momentum

b. Displacement

c. Speed

d. Acceleration

51. The number of foreign tourist arrivals in an island nation is recorded as follows. Which month is the second least visited month? (+1, -0.33)

Months	Number of Tourist
January	2,000
February	1,500
March	2,500
April	3,000
May	2,000
June	1,000

a. January

b. June

c. February

d. May

52. P 3 R I M J 3 Q % W @ / N \$ E 5 X Y 1 # 8

(+1, -0.33)

How many symbols in the above arrangement is / are immediately preceded by a letter and immediately NOT followed by a number?

a. 0

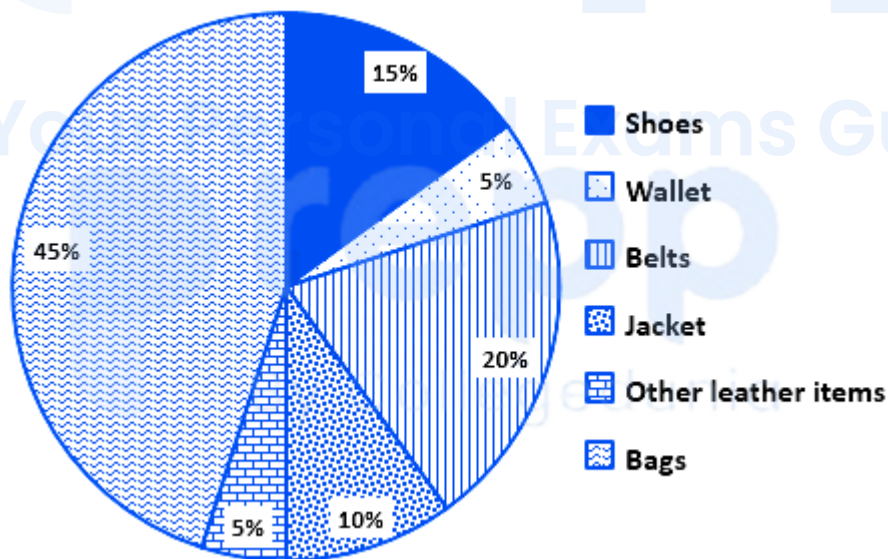
b. 2

c. 3

d. 1

53. The following pie diagram shows the revenue of the company ABC, which manufactures the leather products. The total revenue of the company for the year 2015 was Rs. 3,628,000.

(+1, -0.33)



How much revenue was made with the sale of bags & shoes in 2015?

a. Rs. 27210

b. Rs. 1088400

c. Rs. 544200

d. Rs. 2176800

54. Which are the two chemicals that are used in black and white photography? (+1, -0.33)

a. AgCl and AgBr

b. AgNO₃ and AgBr

c. AgBr and AgI

d. AgCl and AgNO₃

55. Which of the following in Biology is the energy currency of cells? (+1, -0.33)

a. ADP

b. PTA

c. PAD

d. ATP

56. When Magnesium ribbon burns with a dazzling white flame and then in which coloured powder it changes into? (+1, -0.33)

a. white

b. yellow

- c. grey
 - d. black
-

57. What is the Compound Interest on Rs. 20,000 at 12% interest for 1 year, compounded half-yearly? (+1, -0.33)

- a. Rs. 2,982
 - b. Rs. 2,742
 - c. Rs. 2,472
 - d. Rs. 4,274
-

58. Who won the man of the match award in the 2018 ICC Under-19 Cricket World Cup finals? (+1, -0.33)

- a. Ishan Porel
 - b. Manjot Kalra
 - c. Ankul Roy
 - d. Shiva Singh
-

59. If $\frac{x}{x^2-1} = \frac{A}{x-1} + \frac{B}{x+1}$, then find A and B. (+1, -0.33)

- a. 2, 2
- b. 1/2, 1/2
- c. 1/2, -1/2

d. 2, -2

60. If $3x^2 + ax + 4$ is perfectly divisible by $x - 5$, then the value of a is: (+1, -0.33)

a. -12

b. -5

c. -15.8

d. -15.6

61. One of the roots of the equation $x^2 - 12x + k = 0$ is $x = 3$. The other root is: (+1, -0.33)

a. $x = -4$

b. $x = 9$

c. $x = 4$

d. $x = -9$

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



a. 18

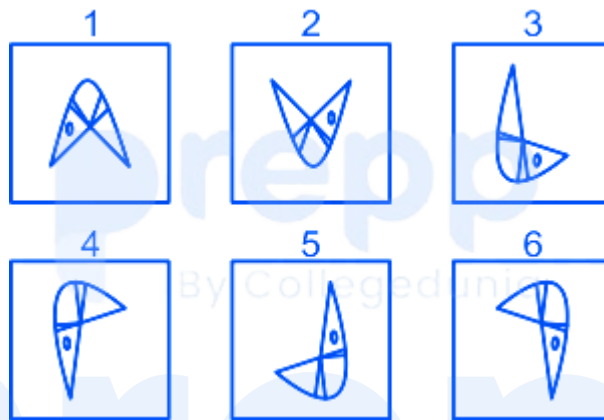
b. 11

c. 17

d. 16

63. Identify the dissimilar object from the below given objects.

(+1, -0.33)



a. 2

b. 3

c. 5

d. 1

Your Personal Exams Guide

64. Who is the founder chairman of Pallium India, a palliative care NGO, who is a Padma Shri and often referred to as the 'father of palliative care in India'?

(+1, -0.33)

a. Sanduk Ruit

b. Bhakti Yadav

c. MR Rajagopal

d. Rani Bang

65. 18.3% of 60 is 54.9% of _____. (+1, -0.33)

- a. 20
- b. 30
- c. 40
- d. 45

66. India's first National Wildlife Genetic Resource Bank was inaugurated by: (+1, -0.33)

- a. Dr Harsh Vardhan
- b. Rajnath Singh
- c. Narendra Modi
- d. Ramkumar Kovind

67. A son's present age is two-fifths of his mother's age. After 8 years, he will be one half of his mother's age. What is his mother's age now? (+1, -0.33)

- a. 40
- b. 50
- c. 42
- d. 36

68. An object travels 30 m in 4 s and then another 70 m in 6 s. What is the average speed of the object? (+1, -0.33)

- a. 8 ms^2
 - b. 10 ms
 - c. 10 ms^{-1}
 - d. 8 ms^{-1}
-

69. An oil container is $\frac{3}{5}$ full. When 20 litres of oil is used from it, it is $\frac{7}{12}$ full. (+1, -0.33)
Find the capacity of the container?

- a. 1000 litres
 - b. 1600 litres
 - c. 1200 litres
 - d. 1400 litres
-

70. "Mohiniyattam" is a dance form popular in which of the following state? (+1, -0.33)

- a. Karnataka
 - b. Telangana
 - c. Rajasthan
 - d. Kerala
-

71. Neel is the only son of Jay's father's only sister. Jay and Neel are _____. (+1, -0.33)

- a. cousins
- b. niece

- c. nephew
 - d. siblings
-

72. Which of the following is the capital of Belarus? (+1, -0.33)

- a. Baku
 - b. Minsk
 - c. Moroni
 - d. Brussels
-

73. How much work is done in moving a charge of 4 C across two points having a P.D of 10 V? (+1, -0.33)

- a. 40 J
 - b. 0.4 J
 - c. 2.5 J
 - d. 4 J
-

74. Muscle / muscular tissue is responsible for _____ in our body. (+1, -0.33)

- a. growth
- b. movements
- c. breathing
- d. drinking

75. Which is the host country of World Environment Day 2018? (+1, -0.33)

- a. India
- b. England
- c. Pakistan
- d. China

76. What is the LCM of 36, 40 and 660? (+1, -0.33)

- a. 6780
- b. 1320
- c. 3960
- d. 1845

77. _____ has very low melting point. (+1, -0.33)

- a. Ba
- b. Na
- c. Ga
- d. K

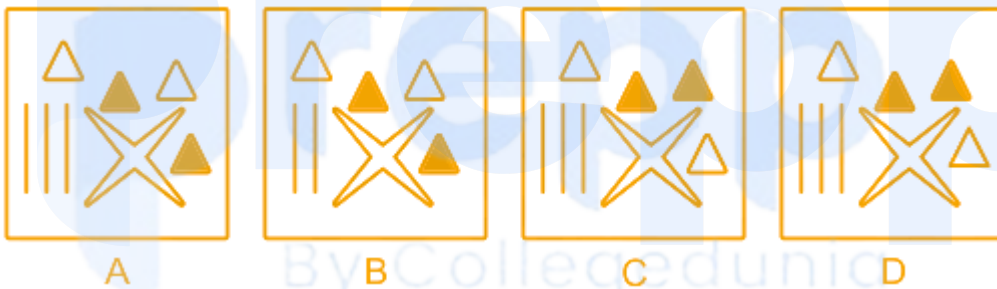
78. Find the odd figure out: (+1, -0.33)



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

79. The figure that does not belong to the group is:

(+1, -0.33)



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

80. In a triangle $\angle B = 90^\circ$ and $\angle A = 30^\circ$ then $\sin^2 A - \cos^2 A + \tan^2 A$:

(+1, -0.33)

- a. $-\frac{3}{12}$
- b. $\frac{1}{6}$

c. $2/6$

d. $-1/6$

-
81. Read the given statement(s) and conclusions carefully and select which of the conclusion logically follow(s) from the statement(s). (+1, -0.33)

Statement:

I. No seats are cushions.

II. Some cushions are pillows.

Conclusions:

1. Some seats are pillows.

2. Some cushions are seats.

a. Conclusion 2 alone follows.

b. Conclusion 1 alone follows.

c. Neither 1 nor 2 follows.

d. Both 1 and 2 follows.

-
82. Pipe A and pipe B can fill up a tank in 40 min and 80 min respectively. (+1, -0.33)
Both the pipes are opened simultaneously for some time and pipe B is closed. If the total time to fill up the tank is 30 minutes, then how long the pipe B was open for?

a. 5 min

b. 10 min

c. 15 min

d. 20 min

83. A man buys 7 bats and 6 balls for Rs. 3,800. Later, he buys 3 bats and 5 balls for Rs. 1,750. What is the cost (in Rs.) of a bat and a ball separately? (+1, -0.33)

a. Bat: 510, Ball: 40

b. Bat: 480, Ball: 70

c. Bat: 500, Ball: 50

d. Bat: 490, Ball: 60

84. Dobereiner made the first observations on _____ as a catalyst. (+1, -0.33)

a. Au

b. Ni

c. Ag

d. Pt

85. When an object is placed beyond the centre of curvature of a concave mirror, the image will be formed: (+1, -0.33)

a. Beyond C

b. Between F and C

c. At C

d. At focus

86. If + stands for $\times$, - for $\div$, $\times$ for - and $\div$ for +, find the value of $32 + 26 - 2 \times 7 \div 12$: (+1, -0.33)

a. 420

b. 421

c. 400

d. 315

87. Which of the following pairs is NOT a pair of twin primes? (+1, -0.33)

a. 197, 199

b. 167, 169

c. 137, 139

d. 107, 109

88. As of 2018, who is the Chief Economic Advisor of India? (+1, -0.33)

a. Arvind Virmani

b. Raghuram Rajan

c. Arvind Subramanian

d. Kaushik Basu

89. The female germ-cells or eggs are made in the: (+1, -0.33)

- a. Ovaries
- b. Uterus
- c. Cervix
- d. Vagina

90. The formula unit mass of CaCl_2 is: (+1, -0.33)

- a. 105 u
- b. 111 u
- c. 121 u
- d. 100 u

91. Who was the prime minister of India during the Pokhran-II nuclear tests held in 1998? (+1, -0.33)

- a. Rajeev Gandhi
- b. Manmohan Singh
- c. A. B. Vajpayee
- d. P. V. Narasimha Rao

92. Vijaya is Arun's sister. David is Rakesh's brother. Rakesh is Vijaya's son. How is David related to Vijaya? (+1, -0.33)

- a. Nephew
 - b. Father
 - c. Son
 - d. Brother
-

93. If today is TUESDAY. After 63 days, it will be: (+1, -0.33)

- a. Wednesday
 - b. Tuesday
 - c. Friday
 - d. Monday
-

94. Who was the Indian para-athlete to have been awarded the Rajiv Gandhi Khel Ratna in 2017? (+1, -0.33)

- a. Devendra Jhajharia
 - b. Mariyappan Thangavelu
 - c. Deepa Malik
 - d. Varun Bhati
-

95. Which team won the Ranji Trophy in the year 2017? (+1, -0.33)

- a. Tamilnadu
- b. Delhi

- c. Vidarbha
- d. Haryana

-
96. Given below is a statement followed by two assumptions numbered I and II. You have to consider the statement and the following assumptions and decide which of the assumptions is implicit in the statement. (+1, -0.33)

Statement: "This bank gives the best interest rates on home loans", claims a private bank.

Assumptions:

- I. Bank gives low interest on home loan to attract customers.
 - II. There are many people who take home loans.
- a. Both I and II are implicit.
 - b. Only assumption II is implicit
 - c. Neither I nor II is implicit
 - d. Only assumption I is implicit

-
97. Two arguments have been given after one statement you have to decide which argument is strong with respect to the given statement. (+1, -0.33)

Statement:

Should there be stray dogs in the colonies?

Arguments:

- I. Yes, they are free and non-violent. Sometimes when their population increases, municipality catches them.

II. No, it is proven that they are dangerous.

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

98. Identify Indian author Aditi Khorana's 2017 book, which is a retelling of an Indian folk tale? (+1, -0.33)

- a. 'A Life of Adventure and Delight'
- b. 'The Library of Fates'
- c. 'No Other World'
- d. 'A Crown of Wishes'

99. Which law states the relationship between the potential difference across a conductor and the current flowing through it? (+1, -0.33)

- a. Newton's law
- b. Faraday's law
- c. Ohm's law
- d. Joules law

100. 16 g oxygen contains _____ atoms of oxygen. (+1, -0.33)

- a. 6.022×10^{-23}
- b. 6.022×10^{23}
- c. 6.022×10^{22}
- d. 6.022×10^{-22}

Prepp

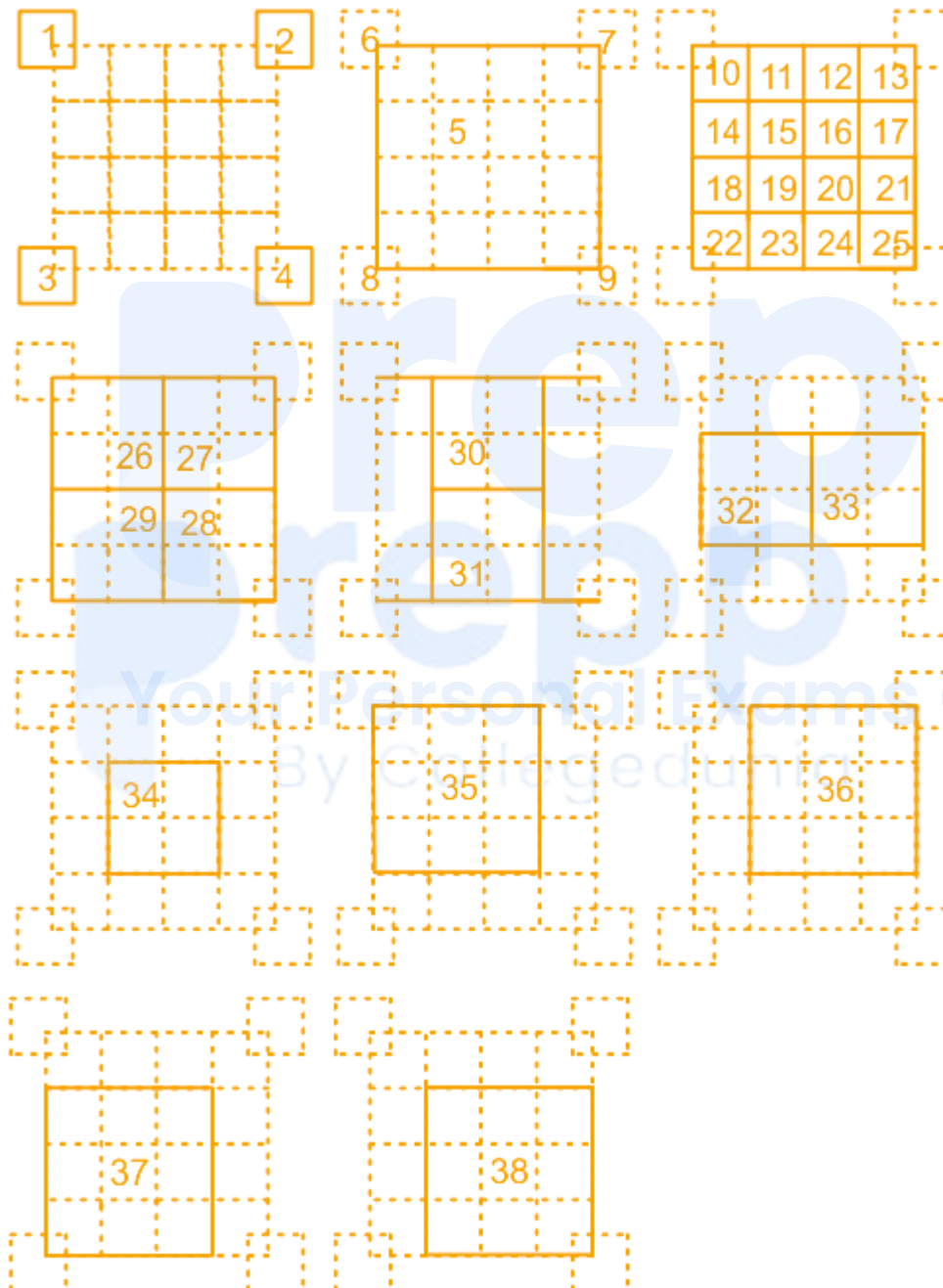
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Answers

1. Answer: b

Explanation:

The number of squares in the given figure is,



Hence, "38" is the correct answer.

2. Answer: c

Explanation:

The correct answer is the Nationalist Congress Party.

Nationalist Congress Party:

- Founded- **25 May 1999**.
- Founder- **Sharad Pawar, P.A. Sangma, and Tariq Anwar**.
- Party Philosophy- **Progressivism**, Populism, **Secular democracy, Gandhian secularism**, Egalitarianism, **Social justice**, Federalism, Social conservatism, **Nationalism**.
- Election Symbol- **Clock**.
- Student wing- **Nationalist Student Congress**.

All India Trinamool Congress:

- Founded- **January 1998**
- Founder- **Mamata Banerjee**
- Party Philosophy- **Secularism and populism**.
- Election Symbol- **Twin flowers in the grass**.
- Student wing- **Trinamool Chhatra Parishad**.

Indian National Congress:

- Founded- **1885**.
- Founder- **Allan Octavian (A.O) Hume**.
- Party Philosophy- **Indian Nationalism (Liberal nationalism)**, **Social democracy**, **Democratic socialism**, **Gandhian socialism**, **Progressivism**.
- Student wing- **National Students Union of India (NSUI)**.
- Election Symbol- **The hand**.

Bahujan Samaj Party:

- Founded- **April 14, 1984.**
- Founder- **Kanshi Ram.**
- Party Philosophy- **Human rights ,Social equality ,Secularism, Social justice ,Self-respect.**
- Election Symbol- **Elephant.**

3. Answer: a

Explanation:

The correct answer is **option 1.**

- In **Nickel** speed of sound **6040 m/s.**
- In **Aluminium**, the speed of sound is **6420 m/s.**

★ Important Points

Speed of Sound in Different Media:

- The speed of sound in the **air** is **331 m/s^{-1} at 0°C and 344 m/s^{-1} at 22°C .**
- It depends on the **type of the medium** through which it is traveling.
- It depends on the **temperature and pressure** of that medium.
- Speed of sound **Decrease**- when it passes from the solid to the gaseous state of a given medium.
- Speed of sound **Increase**- In any medium, when **temperature and humidity increase.**
- Speed of Sound- **Solid > Liquid > Gases**

★ Key Points

Speed of sound in different media at **25°C**

State	Substance	Speed in m/s
Solids	Aluminum	6420
	Nickel	6040
	Steel	5960
	Iron	5950
	Brass	4700
	Glass (flint)	3980
Liquid	Water (sea)	1531
	Water (distilled)	1498
	Ethanol	1207
	Methanol	1103
Gases	Hydrogen	1284

	Helium	965
	Air	346
	Oxygen	316
	Sulfur Dioxide	213

4. Answer: d

Explanation:

The correct answer is The motion of the sun around the planets.

- The **universal law of Gravitation**– Every particle in the universe **attracts every other particle with a force** that is proportional to the product of their masses and **inversely proportional to the square of the distance between them.**
- Sir Isaac Newton discovered **Gravity.**

★ Key Points

The **phenomenons explained** by the **universal law of gravitation**:

- The **force that binds us to the earth.**
- The **motion of the moon around the earth.**
- The **motion of planets around the Sun.**
- The **tides due to the moon and the Sun.**

5. Answer: a

Explanation:

The correct answer is Al (Aluminum).

★ Key Points

- An amphoteric oxide is an oxide that can act as either an acid or base in a reaction to produce salt and water.
- Amphoterism depends on the oxidation states available to a chemical species. Because metals have multiple oxidation states, they form amphoteric oxides and hydroxides.
- Metals that display amphoterism include copper, zinc, lead, tin, beryllium, and aluminum.
- Al_2O_3 is an amphoteric oxide. When reacted with HCl , it acts as a base to form the salt AlCl_3 . When reacted with NaOH , it acts as an acid to form NaAlO_2 .

6. Answer: a

Explanation:

The correct answer is 6.

India is divided into **6** physiographical regions

- The Himalayan Mountains
- The Northern Plains
- The Peninsular Plateau
- The Indian Desert
- The Coastal Plains
- The Islands

Source: <https://ncert.nic.in/textbook/pdf/iess102.pdf>

★ Key Points

Some important facts:

- The folds of the Great Himalayas are asymmetrical in nature.
- The core of this part of Himalayas is **composed of granite**.

- The outermost range of the Himalayas is called the Shiwaliks.
- The **Western Ghats are higher than the Eastern Ghats.**
- The Eastern Ghats **are discontinuous and irregular** and dissected by rivers draining into the Bay of Bengal.

7. Answer: d

Explanation:

The correct answer is 686J.

Explanation:

- At height (h) = 5m
- Mass of the object (m) = 14 kg
- Acceleration due to gravity (g) = 9.8 ms^{-2}
- **Potential Energy = $m \cdot g \cdot h$**
$$= 14 \cdot 5 \cdot 9.8 = 686 \text{J}$$
- Joule (J) is the S.I unit of energy.

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8. Answer: a

Explanation:

The pattern followed is,

The figure has four circles and a right-angle triangle inside it.

Similarly,

There are four circles and a right angle triangle in figure C.

Figure C resembles the given figure.

Hence, option 1 is the correct answer.

9. Answer: c

Explanation:

GIVEN:

Two inlets can fill the tank in 6 hours and 8 hours respectively.

Outlet pipe can empty the tank in 10 hours.

CALCULATION:

Two inlets can fill the tank in 6 hours and 8 hours respectively.

⇒ Quantity of tank filled by inlet pipes in 1 hour = $\frac{1}{6} + \frac{1}{8} = \frac{7}{24}$ units

After 1 hour all the three pipe are opened then tank filled = $\frac{1}{6} + \frac{1}{8} - \frac{1}{10} = \frac{23}{120}$ units

Total work done by all the three pipe = 1 unit

Let the remaining tank be filled in x hours.

$$\Rightarrow \frac{7}{24} + x \times \frac{23}{120} = 1$$

$$\Rightarrow x = \frac{85}{23}$$

∴ Time taken to fill the remaining tank = $\frac{85}{23}$ hours

10. Answer: a

Explanation:

GIVEN:

Total sum = Rs. 210

Percentage of Rs. 5 coin = 20%

Percentage of Rs. 10 coin = 25%

Percentage of Rs. 2 coin = 15%

Percentage of Rs. 1 coin = 40%

FORMULA USED:

Total sum = sum of value of coin number of coins

CALCULATION:

Let the total number of coin be x

$\Rightarrow$ Coin of Rs. 5 = 20% of $x = 0.20x$,

$\Rightarrow$ Coin of Rs. 10 = $0.25x$,

$\Rightarrow$ Coin of Rs. 2 = $0.15x$ and,

$\Rightarrow$ Coin of Rs. 1 = $0.40x$

$\Rightarrow 210 = 5 \times 0.20x + 10 \times 0.25x + 2 \times 0.15x + 1 \times 0.40x$

$\Rightarrow 210 = 4.2x$

$\Rightarrow x = 50$

$\Rightarrow$ Coin of Rs. 1 = $0.40 \times 50 = 20$

$\therefore$ Number of coin of Rs. 1 is 20.

ALTERNATIVE METHOD:

Let the number of coins of Rs. 5, Rs. 10, Rs. 2 and Rs. 1 be in their Percentage ratio

Respected ratios will be 20 : 25 : 15 : 40

$\Rightarrow 4 : 5 : 3 : 8$

Total value of coin = value of coin $\times$ number of coins

$\Rightarrow$ Rs. 5 coin = $4 \times 5 = 20$,

$\Rightarrow$ Rs. 10 coin = 50

$\Rightarrow$ Rs. 2 coin = 6

$\Rightarrow$ Rs. 1 coin = 8

$\therefore$ Respective ratio = 20 : 50 : 6 : 8

$\Rightarrow$ Total sum = Rs. 210

$\Rightarrow 210 / (\text{sum of ratios of total value of coin}) = 210/84 = 2.5$

$\Rightarrow$ Number of Rs. 1 coin = total value of Rs. 1 coin $\times$ 2.5

Number of Rs. 1 coin = $8 \times 2.5 = 20$

$\therefore$ Number of coin of Rs. 1 is 20.

11. Answer: d

Explanation:

The correct answer is Banabhatta.

Explanation:

- Banabhatta was the court poet of king **Harshavardhana**.
- Banabhatta wrote Harshvardhan's biography **Harshacharita** in Sanskrit.
- He describes his association with Thanesar in his biography.

About Banabhatta:

- A great poet of India, Banabhatta was born around the 7th century in a village in India.
- He was born in Pritikuta village, which was situated on the banks of Hiranyavahu.

- He was born to Chitrabhanu and Rajadevi and he was a family of Vatsyayana gotra.
- This poetic genius wrote one of the most famous and earliest novels, known as Kadambari. It is a biographical work of Harsha and Kadambari.

About other options:

- **Bilhana:**
 - He was a Sanskrit writer and a well-known Kashmiri poet.
 - He was born in **Kavi Bilhana** in the middle of the 11th century.
- **Jayadeva:**
 - Jayadeva was born in the middle of the 12th century and his birthplace was **Kendubilwa**.
 - He was the author of the Sanskrit poem '**Gita Govinda**'. He is known for his epic poem 'Gita Govinda', which depicts the divine love of Krishna and his consort, Radha. This poem, which presents the view that Radha is greater than Hari, is considered an important text in the Bhakti movement of Hinduism.
 - Sri Jayadeva was famous in Orissa, especially at Puri Dham for his composition of 'Gita Govinda'. His father's name was **Bhojadeva** and his mother's name was **Radha Devi**. His wife's name was **Padmabati**.
- **Chand Bardai:**
 - Chand Bardai was an Indian poet. He composed **Prithviraj Raso**, an epic poem in Brajbhasa about the life of king Prithviraj Chauhan.

12. Answer: d

Explanation:

The correct answer is **Bindusara**.

Explanation:

- King Ashoka was the son of Bindusara, who belonged to the Maurya dynasty.
- Bindusara was the **second Mauryan emperor** of India.
- He was the son of **Chandragupta Maurya**, the founder of the Mauryan dynasty.

About other options:

- **Chandragupta Maurya:**
 - Chandragupta Maurya, known as **Sandrakottos** to the Greeks, was the founder of the Maurya Dynasty (4th–2nd century BCE) and is credited with the setting up of the first pan-Indian empire.
 - Aided by his mentor and later minister Chanakya or Kautilya (c. 4th century BCE), he set up a vast centralized empire, details of whose functioning, society, military, and economy are well preserved in Kautilya's Arthashastra.
- **Chandragupta II:**
 - He was the next great Gupta emperor after his father Samudragupta (335/350 – 370/380 CE).
 - He came to be known by his title **Vikramaditya** (Sanskrit: "Sun of Power").
 - He carried on the legacy of Samudragupta and contributed his share towards sustaining an extensive empire that carved out a place for itself in history.
- **Bimbisara:**
 - He was a king of the Magadha Kingdom who is credited with establishing imperial dominance in the Indian subcontinent.
 - Son of a minor king called **Bhattiya**, he belonged to the Haryanka Dynasty, which is said to be the second imperial dynasty of Magadha.

13. Answer: c

Explanation:

CONCEPT:

LCM is lowest common multiple which can be found using prime factorization method.

In this we find the prime factors of the given numbers individually and LCM of two numbers

is the product of prime factors counted the maximum number of times they occur in any of

the numbers.

CALCULATION:

$$94 = 2 \times 47$$

$$188 = 2 \times 2 \times 47$$

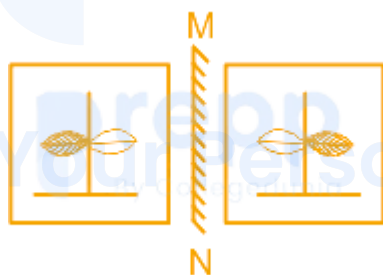
$$235 = 5 \times 47$$

$$\therefore \text{LCM of } 94, 188 \text{ and } 235 = 2 \times 2 \times 5 \times 47 = 940$$

14. Answer: c

Explanation:

The mirror image of the given figure is,



Hence, option 3 is the correct answer.

15. Answer: c

Explanation:

The pattern followed is,

In the first figure the circle is placed on top of a triangle and in the second figure the triangle is inside the circle.

Similarly,

In the third figure the circle is on top of rhombus.

And,

In the fourth figure the rhombus should be inside the circle.

The figure that will come next in the pattern is,



Hence, option 3 is the correct answer.

16. Answer: a

Explanation:

CONCEPT:

Median of a data set is first written in increasing order and it depends upon the total numbers in a particular set.

If total numbers are odd then the middle number is called as median whereas,

If total numbers are even then mean of two exactly middle numbers is called as median.

In this case total numbers are 12 which is even.

CALCULATION:

Considering the given number set

42, 45, 58, 87, 45, 54, 65, 12, 25, 25, 59, 60

Arranging the set in increasing order: 12, 25, 25, 42, 45, 45, 54, 58, 59, 60, 65, 87

$\Rightarrow \text{median} = (45 + 54)/2 = 49.5$

★ Key Points

To obtain the Median of a set of data first we have to arrange the whole data in ascending order and then we have to apply the formula. If we don't do this it will lead us to a wrong answer.

17. Answer: c

Explanation:

Ratio of ages of father and son is 3 : 1.

Let their ages be measured in terms of x .

So, present age of father is $3x$ and that of son is x .

The product of their ages is 147.

$$(3x) \times (x) = 147$$

$$\rightarrow 3x^2 = 147$$

$$\rightarrow x^2 = 49$$

$$\rightarrow x = 7$$

$$\text{Sum of their ages} = 3 \times (7) + 7 = 28$$

Hence, '28' is the correct answer.

18. Answer: c

Explanation:

GIVEN:

Speed of Piyali initially = 66 km/hour and reaches 5 minutes early.

Speed of Piyali after = 54km/hour and reaches 3 minutes late.

FORMULA USED:

Time = distance/speed

CALCULATION:

Let the total distance be x km

We know time = distance/speed,

Time taken to travel at 66 km/hour = $x/66$ hour and,

Time taken to travel at 54 km/hour = $x/54$ hour.

Total difference in time = 5 minutes + 3 minutes = 8 minutes or $8/60$ hours.

$$\Rightarrow x/54 - x/66 = 8/60 \text{ hours}$$

$$\therefore x = 39.6 \text{ km.}$$

$$\therefore \text{Total distance travelled} = 39.6 \text{ km.}$$

ALTERNATIVE METHOD:

Whenever distance is same and difference of time is given:

We can use formula:

$$\text{Distance} = \frac{s_1 \times s_2}{s_1 - s_2} \times \text{difference of time}$$

Substituting the value,

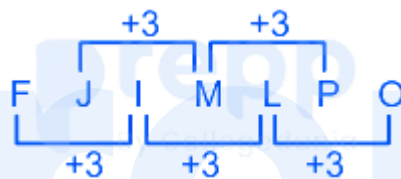
$$\therefore \text{Distance} = 198/5 = 39.6 \text{ km.}$$

19. Answer: c

Explanation:

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

The pattern followed is,



Hence, "O" is the correct answer.

20. Answer: d

Explanation:

The correct answer is Charles Darwin.

Explanation:

- **Theory of evolution by natural selection** was proposed by **Charles Darwin** and Alfred Russel Wallace in the nineteenth century.
- The theory of evolution by natural selection, first formulated in Darwin's book "**On the Origin of Species**" in 1859.
- **Charles Darwin** was born on 12 February 1809, in Shrewsbury, and died 19 April 1882.

About other options:

- **Johann Mendel:**
 - Gregor Mendel, in full Gregor Johann Mendel, was born on 22 July 1822 and died on 6 January 1884.
 - He was botanist, teacher, and Augustinian prelate, the first person to lay the mathematical foundation of the science of genetics, in what came to be called Mendelism.
- **Johann Dobereiner:**
 - Johann Wolfgang Döbereiner was born on 13 December 1780 and died on 24 March 1849.
 - He was the German chemist whose observation of similarities among certain elements anticipated the development of the periodic system of elements.
- **John Dalton:**
 - John Dalton was born on September 5 or 6, 1766, and died on 27 July 1844.
 - He was an English meteorologist and chemist, a pioneer in the development of modern atomic theory.

21. **Answer: a**

Explanation:

GIVEN:

Time taken by Rajan = 6 days

Time taken by Bhavesh = 8 days

Time taken by Charan = Time taken by Rajan and Bhavesh working together.

CONCEPT:

The days required for the work to be done is always the reciprocal of the work done in one day.

CALCULATION

Work done by Rajan and Bhavesh in 1 day = $\frac{1}{6} + \frac{1}{8} = \frac{7}{24}$

$\therefore$ Work done by Charan in one day = $7/24$

$\therefore$ Work done by Charan and Bhavesh in one day = $7/24 + 1/8 = 5/12$

$\therefore$ Time taken by Bhavesh and Charan to finish the task = $12/5$ days = $2\frac{2}{5}$ days

22. Answer: b

Explanation:

The correct answer is Pavan Kumar Chamling.

★ Key Points

- **Explanation:**

- **Pavan Kumar Chamling** was born on **22 September 1949** and he is an Indian politician.
- He was the Founder and President of the Sikkim Democratic Front, which governed the state for five successive terms since 1994.
- He was born in Yangang, in South Sikkim to a Nepali parent's Ash Bahadur Chamling and Ash Rani Chamling.

★ Important Points

- Incumbent CM of Sikkim Prem Singh Tamang since 27 May 2019.

★ Additional Information

- **About Sikkim:**

- **Capital:** Gangtok.
 - **State Animal:** Red Panda.
 - **State Bird:** Blood Pheasant.
 - **State Flower:** Noble dendrobium.
-

23. Answer: d

Explanation:

The correct answer is Power.

- Power:- A Measure of the rate of doing work or transferring energy
- $\text{Power} = \frac{\text{Work}}{\text{Time}} = \frac{\text{Force} \times \text{Displacement}}{\text{Time}}$
- Its SI Unit is Watt.
- Watt:- Watt is Joule Per Second. (J/s).

Extra Facts:-

Force:-

- A-Force is a push or pulls upon an object resulting from the object's interaction with another object. Whenever there is an interaction between two objects, there is a Force upon each of the objects.
- $F = m \times a$ where F= Force, m= mass of object and a= acceleration
- SI Unit:- Newton

Work Done:-

- It is a measure of energy transfer that occurs when an object is moved over a distance by an external force at least part of which is applied in the direction of the displacement.
- $W = fd$ where W= Work, f= force and d= displacement
- SI Unit:- Joule.

Momentum:-

- Momentum is generally defined as " Mass in Motion". All objects have mass, so if an object is moving then it has momentum- it has its mass in motion.
- $P = m \times v$ where P= Momentum, m= mass and V= velocity
- SI Unit:- Kg m/s.

24. Answer: c

Explanation:

The correct answer is PC Mustafa.

- PC Mustafa is an entrepreneur who is CEO and Cofounder of a Company called ID Special Foods Pvt. Ltd.
- The Company employed more than 2000 younger from ruler India to feed millions of Indians Healthy and preservative-free Idli and Dosa Batter including other foods on a daily basis.
- ID Special Foods Pvt. Ltd. is a leading food industry that is providing several flavors of Idli and Dosa.
- The company was established in 2006 by Mustafa and his cousins who started operating ID (Idli, Dosa) from 550 Square Feet.
- PC Mustafa did B.Tech in Computer Science from NIT.
- He got an MBA Degree from IIM Bangalore.

Extra Facts:-

Sunny Varkey:-

- He is the founder and chairman of Global Advisory and Educational Management firm GEMS, Education.

RC Subramoniam:-

- He is the Managing Director at Tenneco Automotive Private Limited, Pune.

25. Answer: c

Explanation:

The total distance to be travelled by the elevator = $430 + 35 = 465$ m.

The speed of the elevator = 7.5 m/min

We know that,

Distance = speed $\times$ time

So time = Distance / speed

The time taken to cover the distance = $465/7.5$

$\Rightarrow$ 62 minutes

26. Answer: d

Explanation:

The correct answer is 1 N x 1 m.

★ Key Points

- 1 Joule = 1 N x 1 m.
- 1 Joule is equal to the energy transferred to an object when a force of one Newton acts on that object in the direction of the force's motion through a distance of one meter.

★ Additional Information

Power:-

- Power is the amount of energy transferred or converted per unit of time.
- SI Unit of Power is **Watt**.

Energy:-

- It is defined as the capacity of doing work.
- It may exist in potential, kinetic, thermal, electrical, chemical, nuclear or other various forms.
- SI unit of Energy is **Joule**.

27. Answer: a

Explanation:

According to the given statement,

Assumption I: This is implicit, because the survey is being conducted on healthiest breakfast in India, and the healthiest can be found from the survey.

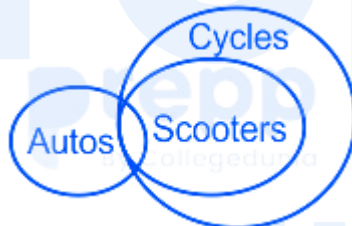
Assumption II: Since, X possesses such skills, only then he is ready to conduct a survey, so this is also implicit.

Hence, "both I and II" are implicit.

28. Answer: b

Explanation:

The least possible Venn diagram is,



Conclusion I: Some autos are cycles → True (This is definitely true)



Conclusion II: No scooter is auto → False (This is definitely false)

Hence, "only I" follows.

29. Answer: c

Explanation:**CALCULATION:**

Considering the given values

$$3/15 = 1/5 = 0.2,$$

$$5/20 = 1/4 = 0.25$$

$$8/64 = 1/8 = 0.125$$

$$25/1000 = 1/40 = 0.025$$

$$\text{So, } 0.25 > 0.20 > 0.125 > 0.025$$

$\therefore$ 25/1000 is the smallest fraction.

30. Answer: a**Explanation:**

Platinum, Silver and Gold are metals.

Whereas,

Oxygen is a gas, which is the life supporting component of the air.

Hence, "oxygen" is the odd one.

31. Answer: a**Explanation:**

GIVEN:

Time taken by A = 12 days,

Time taken by B = 18 days.

CONCEPT:

As A left the work 3 days before so, B has to do the left work alone for 3 days.

CALCULATION:

LCM of 12 and 18 = 36,

Total work = 36 unit

1 day work of A = $36/12 = 3$ unit

1 day work of B = $36/18 = 2$ unit

B alone worked for 3 days, (since As A left the work 3 days before so, B has to do the left work alone for 3 days.)

⇒ Total work done by B alone in 3 days = 3×2 unit = 6 unit work,

⇒ Total work left = 36 unit – 6 unit = 30 unit.

⇒ 30 units work is done by both A and B

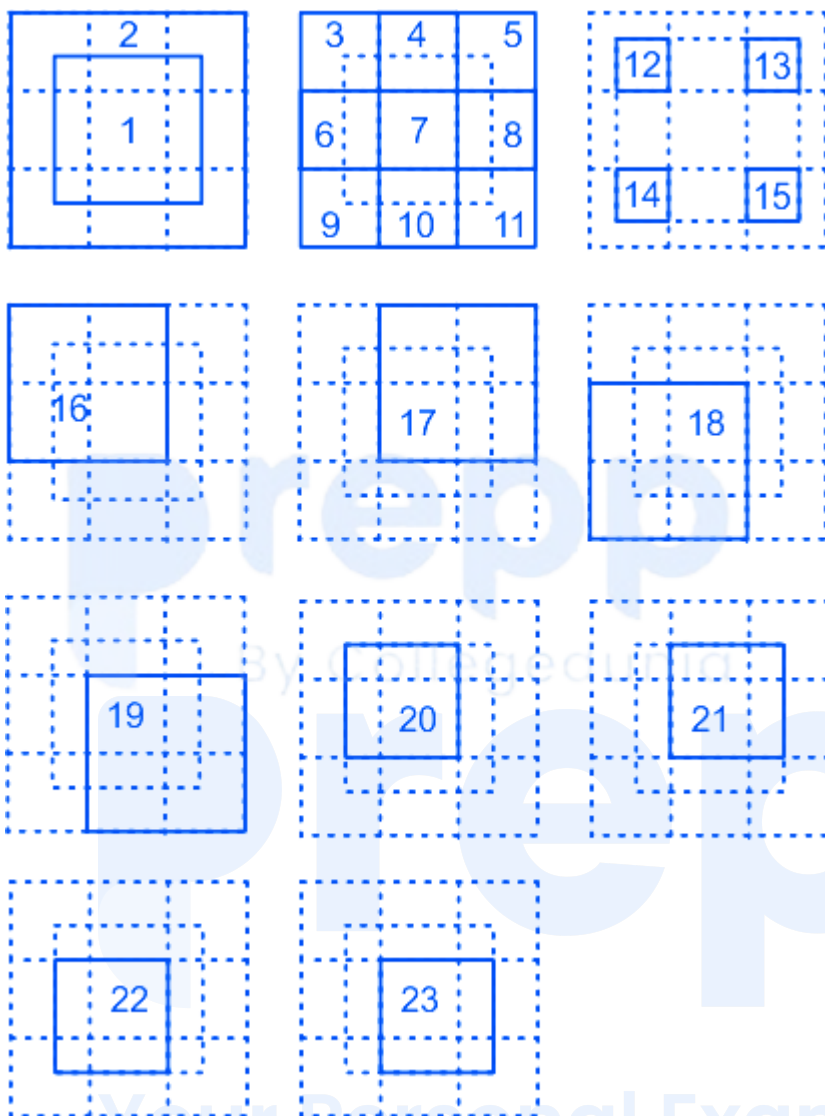
∴ Number of days to complete the remaining work = $30/\text{total work done by A and B in 1 day}$

⇒ $30/5 = 6$ days

32. Answer: d

Explanation:

The number of squares in the given figure is,



Hence, "23" is the correct answer.

33. Answer: c

Explanation:

CALCULATION:

Let the required fraction be x ,

According to question: $x - 1/x = 6 \frac{39}{160}$

$$\Rightarrow (x^2 - 1)/x = 999/160$$

$$\Rightarrow 160x^2 - 160x = 999x$$

$$\Rightarrow 160x^2 - 999x - 160 = 0$$

$$\Rightarrow x = 32/5, -5/32$$

$\therefore$ Value of positive fraction is $32/5$



Alternate Method $\frac{a}{b} - \frac{b}{a} = \frac{999}{160}$

$$\Rightarrow \frac{a^2 - b^2}{ab} = \frac{999}{160}$$

By checking from options,

$ab = 160$, only when $a = 32$ and $b = 5$

$$\text{Also, } 32^2 - 5^2 = 1024 - 25 = 999$$

Hence, $a/b = 32/5$

34. Answer: a

Explanation:

GIVEN:

Number of adults to total number of people ratio = 2 : 9

CALCULATION:

Let the number of adult be $2x$ and,

Total number of people be = $9x$.

$$\Rightarrow \text{Total number of children} = 9x - 2x = 7x$$

According to question there are 65 more children than adults

$$\Rightarrow 7x - 2x = 65$$

$$\Rightarrow x = 13$$

$$\therefore \text{Total number of children} = 7 \times 13 = 91$$

35. Answer: b

Explanation:

According to the given information,

Statement 1: This statement alone is insufficient since we cannot determine the number of packets.

Statement 2: This statement alone is also insufficient since information of about big packets is only given in this statement.

Statement 3: This statement alone is also not sufficient, since information about smaller and larger packets is only given in this statement.

Combining the three,

From statement 2, there are 6 big packets.

From statement 3,

There are twice the amount of smaller packets than there are larger packets.

And,

From statement 1, it is mentioned that half of all packets are the medium packets.

Combining all the three, we can find the number of packets in the box.

Hence, "statement 1, 2 and 3 together" are sufficient.

36. Answer: c

Explanation:

The pattern followed is,

In the first figure, the square is inside the pentagon and in the second figure the square is on the pentagon.

Similarly,

In the third figure, the circle is inside the triangle.

And,

In the fourth figure, the circle should be on the triangle.

The figure which will come next in the pattern is,



Hence, option 3 is the correct answer.

37. Answer: b

Explanation:

The Correct Answer is Karnataka.

- The 7th edition of the Rashtriya Sanskriti Mahotsav (RSM) under the Ek Bharat Shreshtha Bharat matrix, was held in Karnataka on January 14, 2018.
- The event organized by the Ministry of Culture continued till 20th January.
- The state paired with **Karnataka** was **Uttarakhand**.

- The event was inaugurated by Minister of Parliamentary Affairs Ananth Kumar in the presence of Minister of State for Culture Mahesh Sharma.
- Rashtriya Sanskriti Mahotsav aims to celebrate national integration and the idea of unity in the diversity of the country. It celebrates the rich culture and heritage of India.
- It covers events including art forms from classical and folk, Music and Dance, theatre to literature, and Visual Arts.

Other Facts:-

Rashtriya Sanskriti Mahotsav held at different places:-

Year	Place
2015	New Delhi
2016	New Delhi
2017	Ahemdabad
2019	Jabalpur

38. Answer: a

Explanation:

The correct answer is 18 Groups and 7 Periods.

- Modern Periodic Table has 18 Groups and 7 Periods.
- It has 118 Elements.
- Each of the tables has a vertical row is called groups. Elements in groups have similar chemical and physical properties because they have the same number of outer electrons.
- Each of the tables has horizontal rows is called periods. During a period, a gradual change in chemical properties occurs from one element to another.
- It was given by Dmitri Mendeleev.
- The Structure of it is like a bird Grid.

- The Modern Periodic table is used to organize all the known elements.
- **Advantages of Modern Periodic Table:-**
 - It is easier to remember the properties of an element if its position in the periodic table is known.
 - It made the study of Chemistry Systematic and Easy.

Modern Periodic Table:-

Table: Modern Periodic table

The zig zag line separates the metals from the non metals

GROUP NUMBER

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

PERIODS

1 H He

2 Li Be B C N O F Ne

3 Na Mg Al Si P S Cl Ar

4 K Ca Sc Ti V Cr Mn Fe Co Ni Cu Zn Ga Ge As Se Br Kr

5 Rb Sr Y Zr Nb Mo Tc Ru Rh Pd Ag Cd In Sn Sb Te I Xe

6 Cs Ba La* Hf Ta E Re Os Ir Pt Au Hg Tl Pb Bi Po At Rn

7 Fr Ra Ac** Rf Db Sg Bh Hs Mt Ds Rg Cn Uut Fl Mc Lv Ts Og

Transition Metals

*Lanthanoides 6

**Actinoides 7

58	59	60	61	62	63	64	65	66	67	68	69	70	71
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu

90	91	92	93	94	95	96	97	98	99	100	101	102	103
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

39. Answer: d

Explanation:

CONCEPT:

- Uniform motion: The motion of an object in which the object travels in a straight line and its velocity remains constant along that line as it covers equal distances in equal intervals of time, irrespective of the duration of the time.
 - Example: Ball moving on a frictionless surface with constant velocity.

- Non-uniform motion: The motion of an object in which the object travels with varied speed and it does not cover the same distance in equal time intervals, irrespective of the time interval duration.
 - Example: The motion of a train

EXPLANATION:

- During the uniform motion of an object along a straight line, the **velocity remains constant** with time. Hence option 4 is correct.

★ **Additional Information**

- In the uniform motion, the change in velocity of the object for any time interval is zero. This means in the case of uniform motion, the rate of change of velocity, i.e. **acceleration is equal to zero**.

40. Answer: a

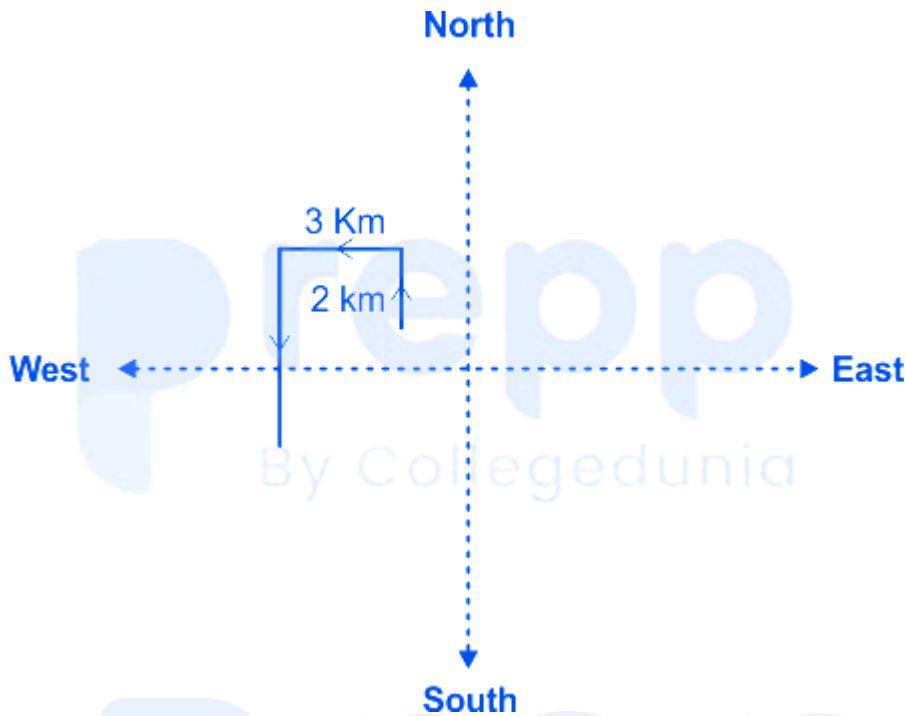
Explanation:

Sublimation is the phase transition of a substance directly from the solid to the gas phase without passing through the intermediate liquid phase. Sublimation is an endothermic process that occurs at temperatures and pressures below a substance's triple point in its phase diagram.

41. Answer: b

Explanation:

Drawing the diagram according to the given information,



He is facing towards south now.

Hence, "south" is the correct answer.

42. Answer: b

Explanation:

1st January 2017 – Monday

2nd January 2017 – Tuesday

3rd January 2017 – Wednesday

4th January 2017 – Thursday

5th January 2017 – Friday

6th January 2017 – Saturday

7th January 2017 – Sunday

Day + 7 days = same day.

Since 2017 is not a leap year, there will be 28 days in February.

In January leaves are = 5th January (1st Friday), 7th January (Sunday), 14th January (Sunday), 21st January (Sunday), 28th January (Sunday). Total = 5

In February leaves are = 2nd February (1st Friday), 4th February, 11th February, 18th February, 25th February. Total = 5

In March leaves are = 2nd March (1st Friday), 4th March, 11th March, 18th March, 25th March. Total = 5.

In April leaves are = 1st April, 6th April (1st Friday).

Hence, 17th holiday will be on 6th April 2017.

43. Answer: b

Explanation:

The pattern followed is,

In all the given figures, except figure A, the figure inside the square is formed with the help of lines.

Whereas,

In figure A, there is a circle immersed in a square.

Hence, option 2 is the odd one.

44. Answer: c

Explanation:

In marketing, product bundling is offering several products for sale as one combined product. It is a common feature in many imperfectly competitive product markets. Industries engaged in the practice include telecommunications, financial services, health care, and information

45. Answer: a

Explanation:

- Cutaneous respiration takes place in earthworms.
- Cutaneous respiration is Gas exchange that occurs via the skin or body surface of animals

Type of respiration	Meaning	Example
Cutaneous	Gas exchange that occurs via the skin or body surface of animals	Earthworms, frogs
pulmonary respiration	The gas exchange occurs via the alveoli in the lungs.	amphibians, reptiles, birds and mammals
Branchial respiration	An animal's intake of oxygen using gills.	aquatic arthropods and molluscs

46. Answer: c

Explanation:

According to the given statement,

Assumption I: Because of the higher fee in the schools some children drop out from schools and work as labour. If education is made free then child labour will be reduced. Hence, this is implicit.

Assumption II: This is not implicit, because education is the topic talked about in the statement, not about all free things.

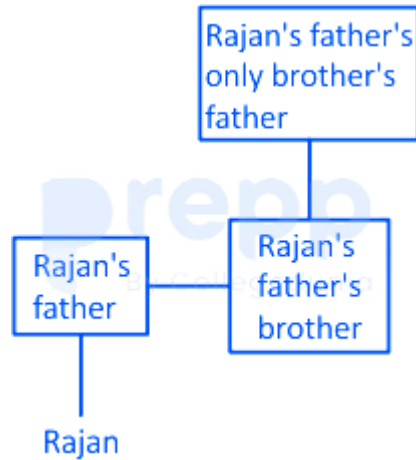
Hence, "only assumption I" is implicit.

47. Answer: a

Explanation:

Symbol in Diagram	Meaning
○	Female
□	Male
==	Married couple
—	Siblings
	Difference of a generation

Drawing the family tree,



Rajan's father's only brother's father is the paternal grandfather to Rajan.

Hence, "paternal grandfather" is the correct answer.

48. Answer: c

Explanation:

- Sarojini Naidu was the first female governor of Uttar Pradesh.
- Sarojini Naidu never took over as the Chief Minister of Uttar Pradesh.
- Sarojini Naidu is also called the Nightingale of India.
- Pandit Govind Ballabh Pant was the first Chief Minister of Uttar Pradesh.
- Narayan Dutt Tiwari was the former Chief Minister of Uttar Pradesh and Uttarakhand.
- Chandra bhanu Gupta was also the Chief Minister of Uttar Pradesh state three times.

49. Answer: b

Explanation:

From the given Bar Graph we can say that,

In the year 2015,

⇒ Ranks scored from institute "ABC" = 80

50. Answer: d

Explanation:

The correct answer is Acceleration.

- The change in the **velocity with respect to time** in a movable object is called **Acceleration**.
- Formulated by **$a = \text{Velocity} / \text{Time taken}$** .
- It is a **Vector Quantity**.
- Unit of this is **(meter/ second²)**.

Momentum

- Momentum is determined **by the product of the mass of the object and its velocity**.
- It is a **vector quantity**.
- The formula is **$M = \text{mass} \times \text{velocity}$** .
- SI unit is **m/s (meter/ second)**.

Speed

- Distance covered in a unit time is called **Speed**.
- It is a **Scalar quantity**.
- SI unit is **meter/second**.
- The formula is **$v = \text{Distance covered} / \text{taken time}$** .

Displacement

- When a body covered the **distance from one position to another position**, then the minimum distance between the **initial and final position** of the body is called **displacement**.
- It is a **vector quantity**.
- Its SI unit is **meter**.
- Displacement can be **positive, negative or zero**.

- Displacement **can be zero** but distance **can never be zero**.

51. Answer: c

Explanation:

From the given table, Arranging number of tourists in descending order:

3000 (April), 2500 (March), 2000 (January and May), **1500 (February)** and 1000 (June)

The second least visited month was February with 1500 tourists

52. Answer: c

Explanation:

According to the given information,

Symbol should be immediately preceded by a letter, but immediately not followed by a number.

Number of times the condition satisfied is:

P 3 R I M J 3 Q % W @ / N \$ E 5 X Y 1 # 8

Q %

W @

N \$

Hence, "3" is the correct answer.

53. Answer: d

Explanation:

GIVEN:

Total revenue = Rs. 3,628,000

Sale of bag = 45%

Sale of shoes = 15%

CALCULATION:

From the given pie chart we can say that,

When manufacturing = 100%, Total revenue = Rs. 3,628,000

100% = Rs. 3,628,000

⇒ 1% = Rs. 36280

Total revenue by bag and shoes = 60%,

⇒ 60% = 60 × 36280

∴ Total revenue by bag and shoes = Rs. 2176800

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54. Answer: a

Explanation:

The correct answer is AgCl and AgBr.

- AgCl, AgBr, AgF and AgI are known as Silver Halides.
- A silver halide is one of the chemical compounds that can form between the element silver and one of the halogens.
- Silver halides are light-sensitive chemicals.

Silver Nitrate (AgNO_3)

- Silver Nitrate is an inorganic chemical with **antiseptic activity**.
- It appears as a **colourless or white crystalline solid** becoming black on **exposure to light or organic material**.
- In its solid form, silver nitrate is coordinated in a **trigonal planar arrangement**.

Uses:

- Type of pesticide used to destroy or inhibit the **growth of disease-causing mechanisms**.
- Related to all forms of **cleaning/washing**, including cleaning products used in **the home, laundry detergents**.
- Drug product, or related to the **manufacturing of drugs**.

★ Key Points

Uses of Silver Halides.

Prepp

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Halide Name	Uses
Silver Chloride(AgCl)	Medicines and silver salts are used in photographic films, electroplating and polishing mirrors and in making alloys.
Silver Bromide (AgBr)	Use in photography. In infrared applications. light-sensitive eyeglasses, and semiconductors
Silver Iodide (AgI)	Used for weather modification applications. In cloud seeding. As an antiseptic material and a photosensitive material in photography.
Silver Fluoride (AgF)	Includes food packaging, paper plates, cutlery, small appliances. For preventing, destroying or mitigating pests.

55. Answer: d

Explanation:

The correct answer is ATP.

ATP(Adenosine Triphosphate):

- It is the **organic compound** composed of the **phosphate groups, adenine, and the sugar ribose** .
- These molecules **provide energy** for various **biochemical processes** in the body.
- That is why it is called **Energy Currency of the Cell** .
- The ATP molecule was **discovered in the year 1929** by German chemist **Karl Lohmann** .
- These ATP molecules are synthesized by **Mitochondria** , therefore it is **called the powerhouse of the cell** .
- **In the year 1948** , Scottish biochemist **Alexander Todd** was the first person to synthesized the ATP molecule .

ADP(Adenosine diphosphate):

- **Adenosine diphosphate (ADP)** , is an important organic compound in **metabolism** and is essential to the flow of **energy in living cells** .
- It is essential in **photosynthesis and glycolysis** .
- It is the **end-product** when **adenosine triphosphate ATP** loses one of its **phosphate groups** .
- The **energy released** in the process is **used to power up** many **vital cellular processes** .
- **ADP reconverts to ATP** by the addition of a **phosphate group** to **ADP** .

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56. Answer: a

Explanation:

The correct answer is white.

- When a piece of **magnesium ribbon** is ignited, **light and heat are produced**.
- The **oxidation or combustion of magnesium** in the air has long been used as a source of intense light in photography and for other photochemical reactions.
- After burning magnesium, it gives **some ash**.
- The **colour** of the ash is **white** when it burns.

57. Answer: c

Explanation:

GIVEN:

Principle (p) = Rs. 20000

Rate of interest (r) = 12%

Effective rate = 6%

Time (n) = 1 year i.e. 2 half years

$n = 2$

FORMULA USED:

When calculate at compound interest

$$\text{Amount (A)} = p \left(1 + \frac{r}{100}\right)^n$$

Where p, r and n respectively are principal, rate of interest and time

And compound interest = Amount – principle

CALCULATION:

$$A = 20000 \left(1 + \frac{6}{100}\right)^2$$

$$\Rightarrow \text{Amount} = \text{Rs. } 22472$$

$$\therefore \text{Compound interest} = 22472 - 20000 = \text{Rs. } 2472$$

58. Answer: b

Explanation:

The correct answer is Manjot Kalra.

- Manjot Kalra made a century in the final match to help Indian team to clinch the title.
- He made 101 not out in 102 balls.
- He made this century against Australia.

Facts about U-19 World Cup 2018.

- It was organised in New Zealand.
- Won by India (4th time).
- Runner up was Australia.

★ Key Points

Titles in the U-19 World Cup:

Title	Player name	Country
Player of the series	Shubhman Gill	India
Most Runs	Alick Athanaze	West Indies
Most Wickets	1. Ankush Roy 2. Qais Ahmed 3. Faizal Jamakhandi	India Bangladesh Canada (All of these bowlers got equal 14 wickets)
Player of the Match (Final)	Manjot Kalra	India

59. Answer: b

Explanation:

$$\frac{x}{x^2-1} = \frac{A}{x-1} + \frac{B}{x+1}$$

$$\Rightarrow \frac{x}{x^2-1} = \frac{A(x+1)+B(x-1)}{x^2-1}$$

$$\Rightarrow x = Ax + A + Bx - B$$

$$\Rightarrow x = x(A + B) + (A - B)$$

On comparing

$$A + B = 1 \quad \text{---(1)}$$

$$A - B = 0 \quad \text{---(2)}$$

From equation (1) and equation (2)

$$A = 1/2 \text{ and } B = 1/2$$

60. Answer: c

Explanation:

$3x^2 + ax + 4$ is perfectly divisible by $x - 5$,

$$\Rightarrow 3 \times 25 + 5a + 4 = 0$$

$$\Rightarrow 5a = -79$$

$$\therefore a = -15.8$$

61. Answer: b

Explanation:

CONCEPT:

Roots of a quadratic equation satisfy the equation, so by putting the value of one root,

One can find the unknown variable and hence the other root.

CALCULATION:

Let us put $x = 3$ in the equation $x^2 - 12x + k = 0$,

$$\Rightarrow 9 - 36 + k = 0$$

$$\Rightarrow k = 27$$

Putting the value of k in the equation,

$$\text{we get: } x^2 - 12x + 27 = 0$$

$$\Rightarrow x^2 - 9x - 3x + 27 = 0$$

$$\Rightarrow x(x - 9) - 3(x - 9) = 0$$

$$\Rightarrow (x - 3)(x - 9) = 0$$

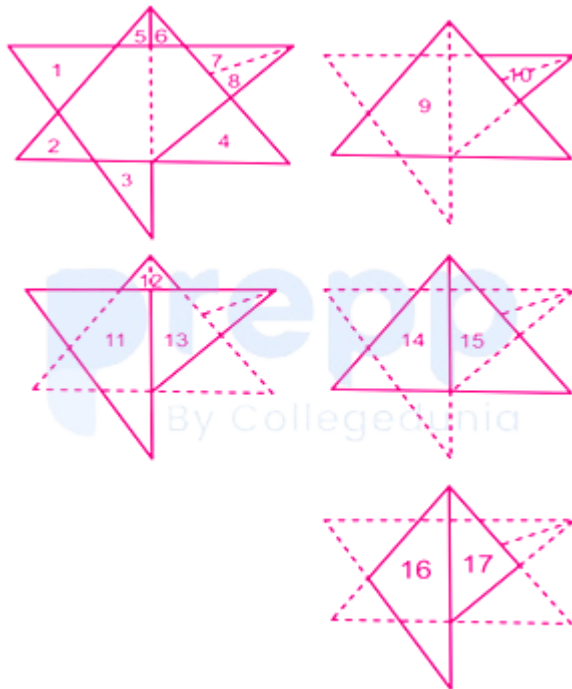
$$\Rightarrow x = 3 \text{ and } 9$$

$\therefore$ Other root of the equation is 9

62. Answer: c

Explanation:

The number of triangles in the given figure is,



Hence, "17" is the correct answer.

63. Answer: b

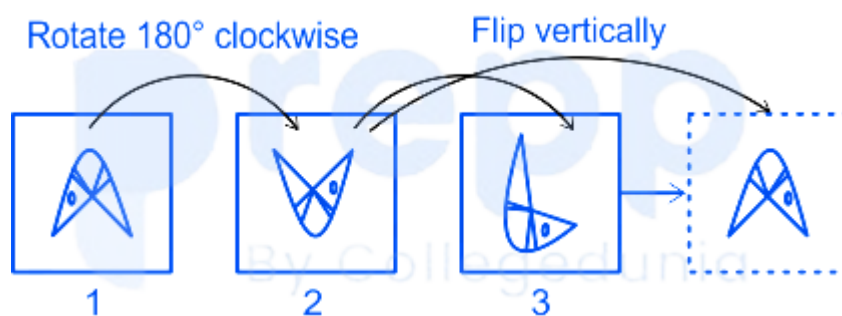
Explanation:

The pattern followed is:

1) The given figure is rotating 180° in clock wise direction in 1st figure to 2nd and 4th to 5th figure.

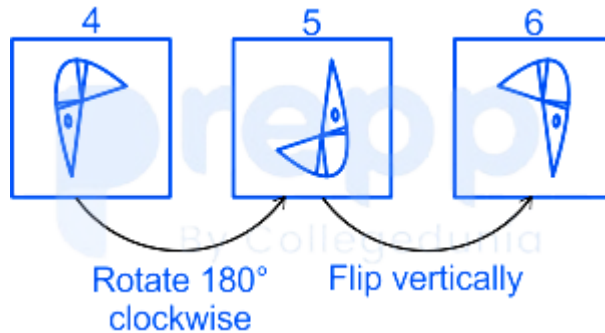
2) And 2nd and 5th figures are flipped vertically.

1st figure to 2nd figure and 3rd figure;



Similarly,

4th to 5th and 5th to 6th figure;



But,

In the 3rd figure it does not follow the pattern.

Hence, option 2 is dissimilar from the given options.

64. Answer: c

Explanation:

The correct answer is MR Rajagopal.

★ Key Points

MR Rajagopal

- Born- Trivantpuram, Kerala
- He is known as the **father of palliative care in India**.
- In 1993, he founded the **Pain and Palliative Care Society (PPCS)** in Medical College, Calicut, **Northern Kerala**.
- He has been working tirelessly since 1993 to integrate palliative care across medical health institutions.
- In 2018, he has been **honored by Padma Shri**.
- "Hippocratic"- A **documentary film** based on **Dr. M R Rajagopal's life**.

★ Additional Information

Palliative Care

- It is an **approach that improves the quality of life of patients** and their families **facing the problem associated** with a life-threatening illness, through the **prevention and relief of suffering** by means of early identification and impeccable assessment and **treatment of pain and other problems**.

Bhakti Yadav

- She was the **first female Doctor from Indore**.
- She had been honored by **Padam Shri**.

Sanduk Ruit

- He is an **ophthalmologist from Nepal**.
- He is one of the founders of the **Tilganga Institute of Ophthalmology**.

Rani Bang

- She is a **social activist** and researcher **working in the field of community health**, in Maharastra.
- She has been honored by **Padam Shri**.

65. Answer: a

Explanation:

CALCULATION:

Considering the given statement

18.3% of 60 is 54.9% of _____.

18.3% of 60

$$\Rightarrow (18.3/100) \times 60 = 0.183 \times 60$$

$$\Rightarrow 10.98$$

Let the value be x ,

$$\Rightarrow (54.9/100) \times x = 10.98$$

$$\therefore x = 20$$

ALTERNATIVE METHOD:

In percentage, we sometime don't require to solve its actual value,

Let the number be $= x$,

$$(18.3/100) \times 60 = (54.9/100) \times x$$

$$\Rightarrow x = \{(18.3/100) \times 60\} / \{(54.9/100)\}$$

$$\therefore x = 20$$

66. Answer: a

Explanation:

The correct answer is Dr Harsh Vardhan.

National Wildlife Genetic Resource Bank :

- Increase the collection of genetic resources from wildlife through collaboration with zoos in India.
- Help in protecting india's biodiversity and environment.

Others Facts:

Name	Post
Dr Harsh Vardhan	Minister of Health and Family Welfare
Rajnath Singh	Minister of Defence of India
Narendra Modi	Prime minister of India
Droupadi Murmu	President of India

67. Answer: a

Explanation:

Let, the age of son be x and the age of mother be y

It is given that the son's present age is two-fifths of his mother's age.

$$x = \frac{2}{5}y \quad \text{----(i)}$$

After 8 Years, the son will be one half of his mother's age

$$x + 8 = \frac{1}{2}(y + 8)$$

$$x = \frac{y}{2} + 4 - 8$$

$$x = \frac{y}{2} - 4 \quad \text{----(ii)}$$

On solving eq (i) and eq(ii)

Hence, the age of the mother is 40 years now.



Given, A son's present age is two-fifths of his mother's age.

Then, we let the age of the mother = $5x$, and the age of son = $2x$

After 8 years, he will be one-half of his mother's age.

Then, Mother = $5x + 8$ and Son = $2x + 8$

$$(5x + 8) \times (1 / 2) = 2x + 8$$

$$5x + 8 = 4x + 16$$

$$5x - 4x = 16 - 8$$

$$x = 8$$

So, the age of son = $x = 8$ years

The age of mother = $5x = 5 \times 8 = 40$ years

68. Answer: c

Explanation:

GIVEN:

Object travels at 30 m per 4 seconds and travels at 70 m per 6 seconds.

FORMULA USED:

Average speed = Total distance/Total time taken

CALCULATION:

Total distance travelled = 70 m + 30 m = 100 m

Total time taken = 4 seconds + 6 seconds = 10 seconds

$\therefore$ Average speed = $100/10 = 10 \text{ m/s} = 10 \text{ ms}^{-1}$

★ Mistake Points

$\text{m/s} = \text{ms}^{-1}$

69. Answer: c

Explanation:

GIVEN:

Initially the container is $\frac{3}{5}$ full,

After using 20 litres, it is $\frac{7}{12}$ full.

CONCEPT:

In both case capacity of container must be same so by taking LCM of the capacity given, we can determine the capacity.

CALCULATION:

Taking LCM of 5 and 12 = 60 unit capacity

Initial quantity filled = $\frac{3}{5} \times 60 = 36$ units

Quantity left after 20 litres is taken

$\Rightarrow \frac{7}{12} \times 60 = 35$ units

By using 20 litres of oil, solution reduced from 36 unit to 35 unit.

$\Rightarrow 1$ unit difference = 20 litres

$\Rightarrow 60$ unit = $60 \times 20 = 1200$ litres.

$\therefore$ Capacity of container = 1200 litres.

70. Answer: d

Explanation:

The correct answer is Kerala.

- Mohiniyattam is a dance form of Kerala.
- Mohiniyattam is one of the **eight classical dance** of India .

★ Key Points

Classical Dance of India:

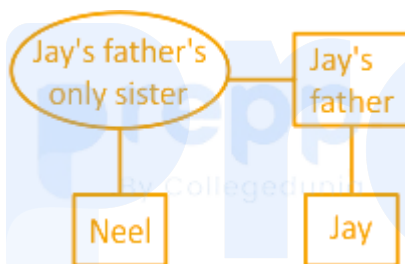
Classical dance	State
Bharatnatyam	Tamilnadu
Kathak	North India State
Kuchipudi	Andhra Pradesh
Odissi	Odisha
Kathakali	Kerala
Sattriya	Assam
Manipuri	Manipur
Mohiniyattam	Kerala

71. Answer: a

Explanation:

Symbol in Diagram	Meaning
○	Female
□	Male
==	Married couple
—	Siblings
	Difference of a generation

Drawing the family tree,



Jay and Neel are cousins.

Hence, "cousins" is the correct answer.

72. Answer: b

Explanation:

The correct answer is **Minsk**.

- Minsk is the capital of Belarus.
- Belarus Currency- **Belarusian ruble**.

★ Key Points

Others Facts:

Capital	Country	Currency
Baku	Azerbaijan	Azerbaijan Manat
Moroni	Comoros	Comoro Franc
Brussels	Belgium	Euro

73. Answer: a

Explanation:

The correct answer is 40 J.

Explanation

- Moving Charge= 4 C (Q)
- Two points having a P.D (V)= 10 V
- Work= W

$$W = VQ$$

$$W = 10v \times 4C = \underline{40 J}$$

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74. Answer: b

Explanation:

The correct answer is movements.

Explanation:

- **Muscle tissue** is a soft tissue that makes up most of the tissues in the muscles of the human muscular system.
- It is the only type of tissue that has cells with the ability to contract.

- This tissue can be used to **move bones, compress chambers, or squeeze various organs** .
- There are **three major types of muscle tissues** in the human body:
 - **Skeletal muscle tissue:**
 - Skeletal muscle is the most common type of muscle tissue in the human body. To move bones in opposite directions, skeletal muscles often consist of pairs of muscles that work in opposition to one another to move bones in different directions at joints.
 - Skeletal muscle fibres are bundled together in units called **muscle fascicles** , which are bundled together to form individual skeletal muscles. Skeletal muscles also have connective tissue supporting and protecting the muscle tissue.
 - **Smooth muscle tissue:**
 - Smooth muscle is muscle tissue in the walls of internal organs and other internal structures such as blood vessels.
 - When smooth muscles contract, they help the organs and vessels carry out their functions. When smooth muscles in the stomach wall contract, for example, they squeeze the food inside the stomach, helping to mix and churn the food and break it into smaller pieces. This is an important part of digestion.
 - Contractions of smooth muscles are involuntary, so they are not under conscious control. Instead, they are controlled by the autonomic nervous system, hormones, neurotransmitters, and other physiological factors.
 - **Cardiac muscle tissues:**
 - Cardiac muscle is found only in the wall of the heart. It is also called **myocardium** .
 - When cardiac muscle contracts, the heartbeats and pumps blood. Contractions of cardiac muscle are involuntary. They are controlled by electrical impulses from specialized cardiac muscle cells in an area of the heart muscle called the **sinoatrial node** .

75. Answer: a

Explanation:

The correct answer is India.

Explanation:

- World Environment Day is a UN Environment-led global event, the single largest celebration of our environment each year, which takes place on **June 5** and is celebrated by thousands of communities worldwide.
- **India** is the global host of 2018 World Environment Day.
- The theme of World Environment Day is **"Beat Plastic Pollution"**.
- The theme **"Beat Plastic Pollution"**, urges governments, industry, communities, and individuals to come together and explore sustainable alternatives and urgently reduce the production and excessive use of single-use plastic polluting our oceans, damaging marine life, and threatening human health.

★ Additional Information

- **Plastic Pollution facts:**
 - Every year the world uses up to 5 trillion plastic bags.
 - Each year, at least 13 million tonnes of plastic end up in the oceans, the equivalent of a full garbage truck every minute.
 - In the last decade, we produced more plastic than in the whole last century.
 - 50 per cent of the plastic we use is single-use or disposable.
 - We buy 1 million plastic bottles every minute.
 - Plastic makes up 10% of all of the waste we generate.

76. Answer: c

Explanation:

CONCEPT:

LCM is lowest common multiple which can be found using prime factorization method.

In this we find the prime factors of the given numbers individually and LCM of two numbers

is the product of prime factors counted the maximum number of times they occur in any of the numbers.

CALCULATION:

$$36 = 2 \times 2 \times 3 \times 3$$

$$40 = 2 \times 2 \times 2 \times 5$$

$$660 = 2 \times 2 \times 3 \times 5 \times 11$$

$$\therefore \text{LCM} = 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 11 = 3960$$

77. Answer: c

Explanation:

The correct answer is Ga.

Explanation:

- **Gallium** has a very low melting point of **29.76°C**.
- Gallium is a soft, silvery metal used primarily in electronic circuits, semiconductors, and light-emitting diodes (LEDs).
- It is also useful in high-temperature thermometers, barometers, pharmaceuticals, and nuclear medicine tests.
- The largest producers of gallium **are Australia, Russia, France, and Germany**.
- **Atomic number (number of protons in the nucleus): 31**
- **Atomic symbol (on the periodic table of the elements): Ga**
- **Atomic weight (average mass of the atom): 69.723**
- **Phase at room temperature: solid**

- **Boiling point:** 3,999 F (2,204 C)
- **Number of isotopes (atoms of the same element with a different number of neutrons):** 24 whose half-lives are known
- **Most common isotopes:** Two stable Ga-69 (natural abundance 60.1 per cent) and Ga-71 (natural abundance 39.9 per cent).

★ Key Points

About other options:

Atomic Symbol	Name of Metal	Melting Point (°C)	Atomic Number
Ba	Barium	727	56
Na	Sodium	97.81	11
K	Potassium	63.5	19

78. **Answer: a**

Explanation:

The pattern followed is,

The figures A, B and C are open figures.

Whereas,

Figure D is a circle, which is a closed figure.

Hence, option 1 is the odd figure.

79. **Answer: d**

Explanation:

The pattern followed is,

The figures A, C and D have the same base figure which is surrounded by other symbols.

Whereas,

Figure B has one line missing.

Hence, option 4 does not belong to the group.

(Note: In original paper this question has discrepancy. The extra shaded triangle in the figure D in question are to be changed. The empty triangle will be as per the figure given above.)

★ **Mistake Points**

Figure D is not the odd one out. Figure B is the odd one out as figure B has one line missing.

80. Answer: d

Explanation:

FORMULA USED:

$$\sin 30^\circ = 1/2,$$

$$\cos 30^\circ = \sqrt{3}/2,$$

$$\tan 30^\circ = 1/\sqrt{3}$$

CALCULATION:

Given $\angle A = 30^\circ$,

$$\sin^2 A - \cos^2 A + \tan^2 A$$

$$\Rightarrow \sin^2 30^\circ - \cos^2 30^\circ + \tan^2 30^\circ$$

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

$$\Rightarrow -1/6$$

$$\therefore \text{Value of } \sin^2 A - \cos^2 A + \tan^2 A = -1/6$$

81. Answer: c

Explanation:

The least possible Venn diagram is,



Conclusion 1: Some seats are pillows → False (This is definitely false)

Conclusion 2: Some cushions are seats → False (This is definitely false)

Hence, "neither 1 nor 2" follows.

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82. Answer: d

Explanation:

GIVEN:

Time taken by pipe A to fill the tank = 40 minute.

Time taken by pipe B to fill the tank = 80 minute.

Total time to fill the tank = 30 min.

CALCULATION:

Total work is LCM of 40 minute and 80 minute,

Total work = 80 unit

⇒ Work done by A in 1 minute = $80/40 = 2$ unit,

⇒ Work done by B in 1 minute = $80/80 = 1$ unit.

Given that tank is filled in 30 minute,

According to the question,

A filled the tank till 30 minute.

Since in 1 minute, A does 2 unit of work,

⇒ In 30 minutes A can do 60 units of work.

Remaining work = 80 unit – 60 unit = 20 unit.

Since in 1 minute, B does 1 unit of work,

⇒ For 20 unit work, time taken by B = 20×1 minute = 20 minute

∴ Tank B was open for 20 minutes.

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83. Answer: c

Explanation:

CALCULATION:

Let us denote cost of bats with x and cost of balls with y.

According to question:

$$7x + 6y = 3800 \quad \text{--- (1)}$$

$$3x + 5y = 1750 \quad \text{--- (2)}$$

Solving equation 1 and 2,

$$7x + 6y = 3800 \quad \text{--- (1) } \times 3$$

$$3x + 5y = 1750 \quad \text{--- (2) } \times 7$$

We get $x = 500$, put the value of x in equation (1),

$$\Rightarrow y = 50$$

$\therefore$ Cost of bat and ball is 500 and 50 respectively.

84. Answer: d

Explanation:

The correct answer is Pt.

★ Key Points

- Dobereiner made the first observation on **platinum** as a catalyst.
- Catalyst is the substance **that increases the rate of a chemical reaction without itself undergoing any permanent chemical change**.
- Each of Dobereiner's triads was a group of three elements.
- The appearance and reactions of the elements in a triad were similar to each other.
- He showed that in **each triad the mean of the lightest and heaviest atomic weights approximated the atomic weight of the middle element**.

★ Additional Information

- **Dobereiner's triads grouped elements with similar chemical properties.**
- Consider lithium, sodium, and potassium, for example.
 - These elements all react with water at room temperature.
 - They react with chlorine to form compounds with similar formulas: LiCl, NaCl, and KCl.

- They combine with hydrogen to form compounds with similar formulas: LiH, NaH, and KH.
- They form hydroxides with similar formulas: LiOH, NaOH, and KOH.

85. Answer: b

Explanation:

The correct answer is between F and C.

- When an object is placed beyond the centre of curvature of a concave mirror, the image will be formed between the focus and centre of curvature.

★ Additional Information

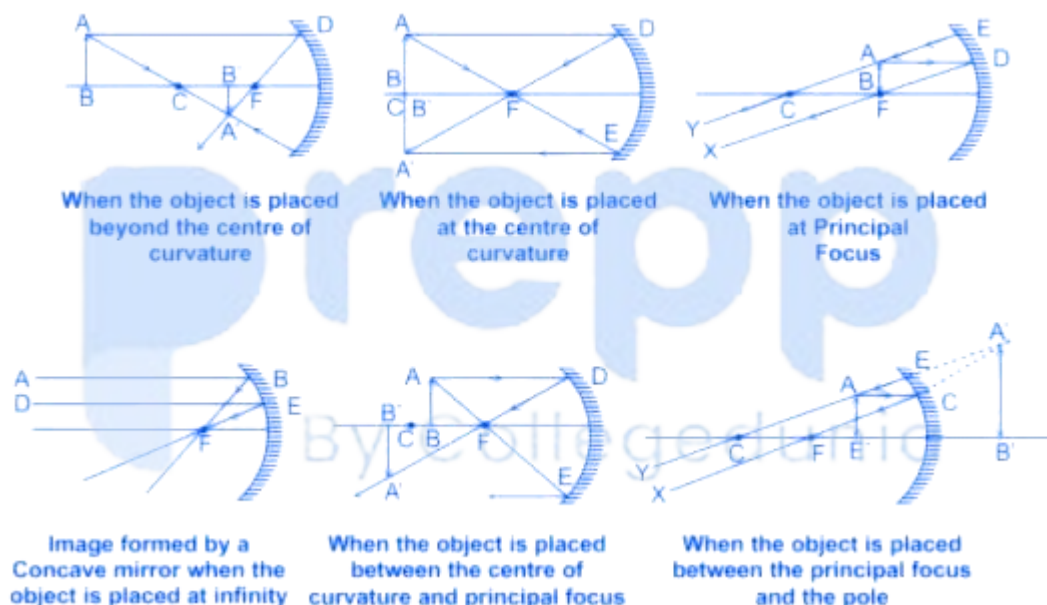
Centre of Curvature:-

- The Centre of a circle which passes through a curve at a given point and has the same tangent and curvature at that point.

Focus:-

- In geometrical optics, a focus also called an image point, is the point where light rays originating from a point on the object converge. Although the focus is conceptually a point, physically the focus has a spatial extent, called the blur circle.

Diagrams:-



86. Answer: b

Explanation:

By decoding given information:

+	-	×	÷
Means			
×	÷	-	+

The original equation is,

$$32 + 26 - 2 \times 7 \div 12$$

Rearranging the symbols,

$$32 \times 26 \div 2 - 7 + 12$$

Using BODMAS rule,

$$32 \times 13 - 7 + 12$$

$$= 416 - 7 + 12$$

$$= 428 - 7$$

$$= 421$$

Hence, "421" is the correct answer.

87. Answer: b

Explanation:

CONCEPT:

A Twin prime are those numbers which are prime and having a difference of two (2) between the two prime numbers. In other words, a twin prime is a prime that has a prime gap of two.

CALCULATION:

Except 167, 169 all are twin prime number,

Since 169 is multiple of 13 it can't be prime or twin prime number

88. Answer: c

Explanation:

The Correct Answer is Arvind Subramanian.

- The Chief Economic Advisor of India in 2018 was Arvind Subramanian.
- He is CEA from 14 October 2014 to 20 June 2018.

- The Chief Economic Adviser (CEA) is a post in the Government of India and is equivalent to the rank of Secretary to the Government of India.
- The CEA is the ex-officio cadre controlling authority of the Indian Economic Service. The CEA is head of the Economic Division of the Department of Economic Affairs, Ministry of Finance, Government of India.
- **Current Chief Economic Advisor of India:- Krishnamurthy Subramanian.**

Extra Facts:-

Name	Time Period
Arvind Virmani	2007-2009
Raghuram Rajan	2012-2013
Kaushik Basu	2009-2012

89. Answer: a

Explanation:

The correct answer is Ovaries.

- The female germ-cells or eggs are made in the Ovaries.
- Ovaries are female gonads-the primary female reproductive organs.
- **These glands have three important functions:-**
 - They secrete hormones,
 - They protect the eggs a female gives birth
 - They release eggs for possible fertilization



Uterus:-

- The Uterus is a hollow muscular organ located in the female pelvis between the bladder and rectum. Once the egg has left the ovary it can be fertilized and implant itself in the lining of the uterus. The main function of the uterus is to nourish the developing fetus prior to birth.

Cervix:-

- The cervix is the lower part of the Uterus. The Cervix forms a canal that opens into the vagina, which leads to the outside of the body.

Vagina:-

- The vagina is a closed muscular canal that extends from the vulva – the outside of the female genital area – to the neck of the uterus.

90. Answer: b

Explanation:

The correct answer is 111 u.

- The formula unit mass of CaCl_2 is 111 u.
- Atomic Mass of Ca = 40
- Atomic Mass of Chlorine = $35.5 \times 2 = 71$
- Formula Unit Mass = $40 + 71 = 111$.
- Formula unit mass is defined as the sum of the mass of all the atoms each multiplied by atomic masses that are present in the empirical formula of a compound.
- CaCl_2 or calcium chloride is also known as Ice Bite.

91. Answer: c

Explanation:

The correct answer is A.B.Vajpayee.

- The Prime minister of India during the Pokhran-II nuclear tests held in 1998 was Atal Bihari Vajpayee.
- He was an Indian Statesman who served three terms as the Prime Minister of India, first for a term of 13 days in 1996, then for a period of 13 months from 1998 to 1999, followed by a full term from 1999 to 2004.
- Born:- 25 December 1924
- Died:- 16 August 2018

★ Key Points

Extra Facts:-

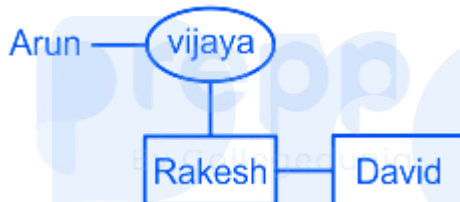
Name	Time Period
Rajeev Gandhi (6 th PM)	1984 to 1989
Manmohan Singh (13 th PM)	2004 to 2014
P.V. Narasimha Rao (9 th PM)	1991 to 1996

92. Answer: c

Explanation:

Symbol in Diagram	Meaning
○	Female
□	Male
==	Married couple
—	Siblings
	Difference of a generation

Drawing the family tree,



David is the son of Vijaya.

Hence, "son" is the correct answer.

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93. Answer: b

Explanation:

Considering today is Tuesday,

A week consists of 7 days.

63 days is equal to 9 weeks.

Exactly after 63 days, that is 9 weeks, it will be a Tuesday.

Hence, "Tuesday" is the correct answer.

94. Answer: a

Explanation:

The correct answer is Devendra Jhajharia.

- In 2017 Rajiv Gandhi Khel Ratna award was given to Devendra Jhajharia (para-athlete) and Sardara Singh (Hockey).

★ Key Points

Devendra Jhajharia is an Indian Para Olympic Javelin thrower.

- He is the first India to win **two** gold medals at Para Olympics.
- He won gold in **2004** and the **2016 Para Olympics**.
- He is also the **only Para Athlete** to be awarded **Padma Shri**.
- **Murlikant Petkar** was first Indian Para Athlete to win gold medal at Para Olympics.

Varun Singh Bhati is a para high jumper from India.

- He has won several medals in international events.
- He won **bronze** at **2016 Summer Paralympic Games** and **2017 World Para Athletics Championships**.

Mariyappan Thangavelu is an Indian para-athlete.

- He won a gold medal in the **2016 Rio Para Olympics**.
- He is a **Para Olympic high jumper**.
- He was awarded **Rajiv Gandhi Khel Ratna** for 2020.

Deepa Malik is an Indian para-athlete.

- She is the **first Indian woman** to win a medal in the **Para Olympic games**.
- She won a **silver medal** in the **2016 summer Para Olympics** in **shot put**.

Shakshi Malik is an Indian **freestyle wrestler** from Haryana.

- She won a **bronze medal** in the **2016 Summer Olympics**.
- She is the **first female wrestler** from India to win a **gold medal** at Olympics.

★ Additional Information

Raji Gandhi Khel Ratna Award.

- It was instituted in **1991**.
- This is the **highest sporting award** given by the **Ministry of Youth Affairs and Sports**.
- It is given for the **spectacular and most outstanding performance** in the field of sports by a sportsperson over a **period of four years**.
- The winner of the **Rajiv Khel Ratna Award** gets a reward of **7.5 lac rupees**.
- **Vishwanathan Anand** was the **first recipient of the award**.
- The Rajiv Gandhi Khel Ratna Award can be given a **maximum of three persons** in a year.
- But in **2016**, shuttler **P V Sindhu**, gymnast **Dipa Karmakar**, shooter **Jitu Rai**, and wrestler **Sakshi Malik** had received this award.

95. Answer: c

Explanation:

The correct answer is Vidarbha.

★ Key Points

The Ranji Trophy

- The Ranji Trophy is **India's first-class domestic cricket competition**.
- **Regional and state cricket associations** of the country take part in this tournament.
- The competition is **named after Ranjit Singhji**, the **first Indian player who participated in international cricket** from India.
- The **first edition** of Ranji Trophy was organized in **1934**.

- **Mumbai** has won the **Ranji Trophy** title for **41 times**, while **Vidarbha** has won this title **twice**.
-

96. **Answer: a**

Explanation:

According to the given information,

Assumption I: This is implicit, because the customers get attracted to the banks which will give low interest rates.

Assumption II: Schemes like low interest rates are introduced by the banks because many people take home loans.

Hence, this is implicit.

Hence, "both I and II" are implicit.

97. **Answer: b**

Explanation:

Argument 1: This is strong, because when the population of these dogs increases, the municipality people will take them away.

Argument 2: This is also strong, because they are dangerous.

Hence, "both 1 and 2" are strong.

98. **Answer: b**

Explanation:

The correct answer is 'The Library of Fates'.

- 'The Library of Fates' is a book authored by **Aditi Khorana** which is a retelling of an Indian romantic folktale.

Other books by **Aditi Khorana** include-

- **Mirror in the sky (2016).**
- **Liferaft (2019).**

★ Key Points

- 'A Life of Adventure and Delight' is authored by **Akhil Sharma**.

Other books by **Akhil Sharma** includes:

- **Cosmopolitan: Faber Stories.**
- **An Obedient Father.**
- **Family Life.**
- 'A Crown of Wishes' is a book authored by **Roshani Chokshi**.

Other books by the author include:

- **The Glided Wolves.**
- **Star touched queen.**
- **Aru Shah & The Song of Death.**
- 'No Other World' is a novel by **Rahul Mehta**.
- Other books authored by him include - **Quarantine: Stories (2010).**

99. Answer: c

Explanation:

The correct answer is Ohm's law.

- The relationship between the potential difference across a conductor and current flowing through it is determined by Ohm's law.

- Ohm's law states that **potential difference across a conductor is directly proportional to the current flowing through it.**

$V \propto I$

i.e. $V = IR$

V = Potential difference

I = Current

R = Resistance. (constant)

★ Key Points

Newton's Laws.

- **Newton's laws of motion** relate an object's motion to the forces acting on it.
- He gave three laws of motion -
 - The first law states that an **object will not change its motion unless an external force acts on it.**
 - The second law states that **force experienced is proportional to its mass times acceleration.**
 - The Third law of motion states that **every action has an equal and opposite reaction.**

Faraday's Law of Induction

- It states that induced voltage in a **circuit** is **proportional** to the rate of change over time of **magnetic flux** through that circuit.

Joule's law of heating

- This law states that **when the current (I) passes** through a conductor of **resistance (R)** for **time (t)** then heat produced by the conductor is equal to the product of the square of the current, the resistance, and time.

$H = I^2 R t$ joules

H = heat produced

I = current

R = Resistance

t = time

The unit is **Joules**.

100. Answer: b

Explanation:

The correct answer is 6.022×10^{23} .

- This is called the **Avogadro Numbers** .
- **Avogadro's number** , number of units in **one mole of any substance (defined as its molecular weight in grams)** .
- It is equal to $6.02214076 \times 10^{23}$.
- The units may be **electrons, atoms, ions, or molecules**, depending on the nature of the substance and the character of the reaction.
- It is based on **Avogadro's law** .
- This law states that under the same conditions of temperature and pressure, **equal volumes of different gases contain an equal number of molecules** .
- This empirical relation can be derived from **the kinetic theory of gases under the assumption of a perfect (ideal) gas** .
- The law is approximately valid for real gases at **sufficiently low pressures and high temperatures** .