



Your Personal Exams Guide



NDA



CDS



SSC CGL



CBSE UGC NET



IAS



SSC CHSL



CTET



MPSC



AFCAT



CSIR UDC NET



IBPS PO



UP POLICE



SSC MTS



SBI PO



BPSC



UP TET



IBPS RRB



IBPS CLERK



IES



UPSC CAPF



SSC Stenogr..



RRB NTPC



SSC GD



RBI GRADE B



RBI Assistant



DSSSB

RRB Group D 2018 Previous Year Paper (26-Sep-2018) (Shift 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. The sum of $\frac{5}{11}$ and $\frac{11}{5}$ is: (+1, -0.33)
- a. $\frac{16}{55}$
 - b. $\frac{110}{55}$
 - c. $\frac{146}{55}$
 - d. $\frac{16}{16}$
-
2. Who is the author of the book 'Half Girl Friend', released recently? (+1, -0.33)
- a. Shashi Tharoor
 - b. Vinod Chopra
 - c. Chetan Bhagat
 - d. Rajdeep Sardesai
-
3. Tartaric acid is a constituent of _____. (+1, -0.33)
- a. Baking powder
 - b. Baking soda
 - c. Washing soda
 - d. Vinegar
-
4. 63% of a number is 315. What is the number? (+1, -0.33)

- a. 500
 - b. 420
 - c. 475
 - d. 450
-

5. Find the next term in this series.

(+1, -0.33)

2, 18, 162, _____.

- a. 1458
 - b. 1584
 - c. 2400
 - d. 1400
-

6. Eka-silicon is known as _____.

(+1, -0.33)

- a. Germanium
 - b. Silicon
 - c. Gallium
 - d. Aluminium
-

7. Which of the following teams won the 2016 Premier Badminton League?

(+1, -0.33)

- a. Delhi Acers

- b. Chennai Smashers
 - c. Mumbai Rockets
 - d. Hyderabad Hunters
-

8. The volume of a right circular cone, whose radius of the base is the same as five-ninths of its altitude and the volume of a sphere are equal. The ratio of the radii of the cone to the sphere is: (+1, -0.33)

- a. $\sqrt[3]{4} : \sqrt[3]{3}$
 - b. 1 : 1
 - c. $\sqrt[3]{60} : 3$
 - d. $\sqrt[3]{3} : \sqrt[3]{2}$
-

9. Who among the following won a gold medal at the World Weightlifting Championship 2017? (+1, -0.33)

- a. Seguru Ana
 - b. Mirabai Chanu
 - c. Sukcharoen Thunya
 - d. Karanam Malleshwari
-

10. Which does NOT belong to this group? (+1, -0.33)

- A. Rack
- B. Window

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

11. The absolute refraction index of diamond is _____. (+1, -0.33)

- a. 2.23
- b. 2.32
- c. 2.42
- d. 2.24

12. The Harshacharitra by _____ gives us accurate information about Harsha and his administration. (+1, -0.33)

- a. Fa Hien
- b. Tulsidas
- c. Kalhana
- d. Banabhatta

13. Identify the wrong term from the following series. (+1, -0.33)

1, 8, 27, 125, 342, 1331

- a. 1331
 - b. 27
 - c. 342
 - d. 125
-

14. As of August 2018, who is the present union minister of Agriculture and Farmers Welfare? (+1, -0.33)

- a. Arun Jaitley
 - b. Radha Mohan Singh
 - c. J.P. Nadda
 - d. Piyush Goyal
-

15. India tested its first nuclear device in _____. (+1, -0.33)

- a. Sriharikota
 - b. Kalpakaam
 - c. Pokhran
 - d. Tarapur
-

16. Which figure follows next? (+1, -0.33)



Option Figures



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

17. Find the value of $\sqrt{4.2436}$ (+1, -0.33)

- a. 2.04
- b. 2.14
- c. 2.06
- d. 2.16

18. A solution contains 60 g of common salt in 340 g water. Calculate the concentration of salt in terms of mass by mass percentage of the solution. (+1, -0.33)

- a. 60%
 - b. 25%
 - c. 15%
 - d. 10%
-

19. _____ double bond(s) is/are present in one molecule of Benzene. (+1, -0.33)

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

20. Who established the Sun TV Network? (+1, -0.33)

- a. Kalanithi Maran
 - b. Rakesh Jhunjhunwala
 - c. Vikas Oberoi
 - d. Ranjan Pai
-

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

What will be the age of S, 3 years from now?

Statements:

1. Mis 25 years old today
 2. Sis younger to Mby 10 years
- a. Statement 2 alone is sufficient
 - b. Statement 1 alone is sufficient
 - c. statement 1 and 2 together are not sufficient
 - d. statements 1 and 2 together are necessary
-

22. Which of the following numbers will have an irrational square root? (+1, -0.33)

- a. 13225
 - b. 18025
 - c. 15625
 - d. 21025
-

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

K, F, M and T are standing in a queue. Based on the following information, can we tell who is standing in the second place if we arrange shortest to tallest?

Statements:

1. F is the tallest.
2. K is taller than T.
3. T is the shortest.

- a. statements 1 and 2 together are sufficient.
- b. statement 1 and 3 are sufficient to solve.
- c. The statements are insufficient.
- d. Statements 1, 2, 3 alone are enough to solve.

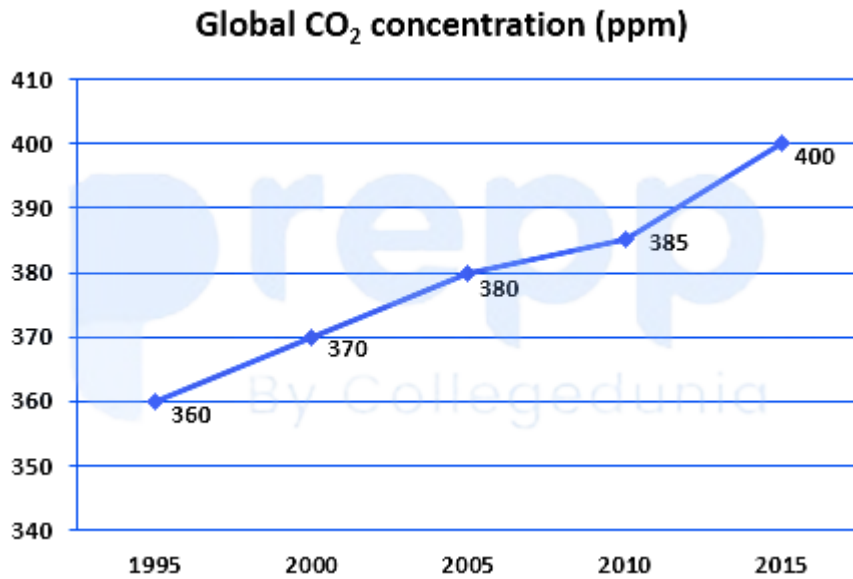
24. In a bag the ratio of red balls to green balls is 15 : 26. If 12 more green balls are added to the bag the ratio of red balls to green balls will become 1 : 2. How many red balls are there in the bag? (+1, -0.33)

- a. 30
- b. 45
- c. 15
- d. 60

25. Mendel obtained F₂ progeny from F₁ generation plants by the method of ----- (+1, -0.33)

- a. Cross-pollination
- b. Vegetative propagation
- c. Asexual reproduction
- d. Self-pollination

26. Based on the given graph, what is the percentage change in CO₂ concentration from year 1995 to 2015? (+1, -0.33)



- a. 11.00%
- b. 11.31%
- c. 11.26%
- d. 11.11%

27. Zinc can displace copper from copper sulphate solution because zinc is ----- (+1, -0.33)

- a. more reactive than copper
- b. less reactive than copper
- c. more oxidised than copper
- d. less oxidised than copper

28. Which Indian woman cricketer crossed the 200 ODI wickets in 2018? (+1, -0.33)

- a. Charlotte Edwards

- b. Dane van Niekerk
 - c. Meg Lanning
 - d. Jhulan Goswami
-

29. Name the supersonic missile that was successfully test-fired by the Indian Navy in 2017? (+1, -0.33)

- a. Agni
 - b. Vajra
 - c. BrahMos
 - d. GSAT-17
-

30. In _____, local thunderstorms are called mango shower which helps in ripening mango crop. (+1, -0.33)

- a. Odisha
 - b. Gujrat
 - c. Uttar Pradesh
 - d. Kerala
-

31. If $2x^2 + ax + 2b$, when divided by $x - 1$, leaves a remainder of 16 and $x^2 + bx + 2a$, when divided by $x + 1$, leaves a remainder of -1 then $a + b$ equals: (+1, -0.33)

- a. 14
- b. -8

c. -14

d. 8

32. $104 \div [68 - \{29 - (45 - 56 \div 7 \times 4)\}] = ?$ (+1, -0.33)

a. 4

b. 2

c. 8

d. 13

33. In the modern periodic table, elements having atomic numbers 19 to 36 are placed in the period ----- (+1, -0.33)

a. 4

b. 6

c. 5

d. 3

34. If $a + \frac{1}{a} = -6$, find the value of $a^3 + \frac{1}{a^3}$ (+1, -0.33)

a. 216

b. -198

c. -216

d. 198

35. Which of the options bears the closest resemblance to the following figure?

(+1, -0.33)



A

B

C

D

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

36. A and B can complete a task in 50 days, B and C can complete it in 37.5 days while C and A can do the same task together in 30 days, How many days will A, B and C each take complete the task individually?

(+1, -0.33)

- a. 40, 60 and 120
- b. 60, 120 and 40
- c. 75, 150 and 50
- d. 50, 150 and 75

37. A shop consumed 250 units of energy in a month. How much energy was consumed in joules? (+1, -0.33)

- a. $9 \times 10^{-8} \text{ J}$
- b. $9 \times 10^{-7} \text{ J}$
- c. $9 \times 10^8 \text{ J}$
- d. $9 \times 10^7 \text{ J}$

38. The two roots of a quadratic equation are given as $x = \frac{4}{3}$ and $x = \frac{-3}{7}$. The equation can be written as: (+1, -0.33)

- a. $(7x - 3)(3x - 4) = 0$
- b. $(7x + 3)(3x - 4) = 0$
- c. $(7x + 3)(3x + 4) = 0$
- d. $(7x - 3)(3x + 4) = 0$

39. Usha Uthup of West Bengal won the Padma Shri for which field? (+1, -0.33)

- a. Literature
- b. Social Work
- c. Arts
- d. Theatre

40. Pyarimohan Mohapatra is a political leader belonging to which Indian state? (+1, -0.33)

- a. Assam
- b. West Bengal
- c. Bihar
- d. Odisha

41. Bone cells are embedded in a hard matrix that is composed of (+1, -0.33)

-
- a. Ca and Na
 - b. P and Na
 - c. Ca and F
 - d. Ca and P

42. If '<' is treated as '+' and '×' is treated as '÷', then what will be the value of (+1, -0.33)

$$([(25 < 15)] \times 4) < 1?$$

- a. 11
- b. 5
- c. 20
- d. 13

43. Last year, Mayank's capital investment in a small business venture was ₹ 20,000. This year, to cater to new customer base, he is planning to increase the capital funding to 30% of what he had invested last year. How much money is he planning to invest this year? (+1, -0.33)

- a. 23,000
- b. 22,500
- c. 60,000
- d. 26,000

44. 2500 Watts = _____ kW (+1, -0.33)

- a. 250
- b. 0.25
- c. 25
- d. 2.5

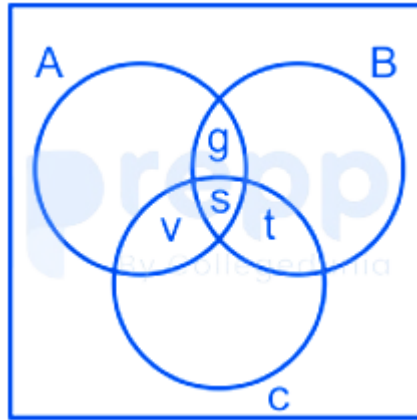
45. _____ is commonly used in electrical heating devices. (+1, -0.33)

- a. Copper
- b. Nichrome
- c. Iron
- d. Aluminium

46. A boy is observing a hot air balloon flying at 692 m above ground. The angle of elevation of balloon from the eyes of the boy was 60° . After sometime, the balloon moves away horizontally from the boy and the angle reduces to 30° . What is the approximate distance travelled by the balloon? Take $\sqrt{3} = 1.73$ (+1, -0.33)
- a. 400 m
 - b. 800 m
 - c. 600 m
 - d. 200 m

47. The square root of 4356 is: (+1, -0.33)
- a. 84
 - b. 66
 - c. 64
 - d. 76

48. Based on the given Venn diagram, answer the following question. (+1, -0.33)
- A- People who are efficient
 - B- People who are honest
 - C- People who are hard-working



Which segment represents people who are only hardworking but not honest or efficient?

- a. $c - (v + s + t)$
- b. $c - (v + s)$
- c. c
- d. $c - (v + t)$

49. Select the term that relates to the third term in the same way that the second term relates to the first term. (+1, -0.33)

Trees : Plants :: Desert : ?

- a. Mirage
- b. Palm
- c. Water
- d. Land

50. Which of the following is one of the features of Insolvency and Bankruptcy Code (Amendment) Ordinance, 2018? (+1, -0.33)

- a. Relief to home buyers by recognising their status as financial creditors
- b. Full waiver of interest
- c. Payment of interest subsidy
- d. Free loan to creditors

51. In a certain code, if TIME is written as 209135, then how will WATCH be written as? (+1, -0.33)

- a. 2312038
- b. 2412039
- c. 2412038
- d. 2312039

52. What is the maximum number of electrons that can be accommodated in k shell? (+1, -0.33)

- a. 18
- b. 32
- c. 2
- d. 8

53. India's first Videsh Bhavan will be established in which of the following states? (+1, -0.33)

- a. Jharkhand
- b. Bihar
- c. Maharashtra
- d. Gujarat

54. A flatworm named _____ has very simple 'eyes' that are really just eye-spots which detect light. (+1, -0.33)

- a. Ascaris
- b. Tapeworm
- c. Liverfluke
- d. Planaria

55. Find the next term in this series (+1, -0.33)

343, 383, 443, 483, _____.

- a. 543
- b. 548
- c. 600
- d. 643

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

Statement:

After watching a movie, Leela said, "I will suggest all my friends to watch this movie."

Conclusions:

- I. Leela enjoyed watching the movie
- II. She wants her friends to watch too

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

57. In a code language, GATE is written as 71205. What is the code for DOOR? (+1, -0.33)

- a. 4151519
- b. 4151518
- c. 5151518
- d. 4151520

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

Are smart phones addictive?

Arguments:

I. Yes, once you are used to smart phones, you tend to spend more time on mobiles ignoring personal time.

II. No, they offer additional features that are very necessary for modern day lifestyle.

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

59. The formula of ethanol is ----- . (+1, -0.33)

- a. CH_5OH
- b. $\text{C}_2\text{H}_6\text{OH}$
- c. $\text{C}_2\text{H}_5\text{OH}$
- d. $\text{CH}_3\text{CH}_2\text{OH}_2$

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



- a. 5
- b. 6

c. 9

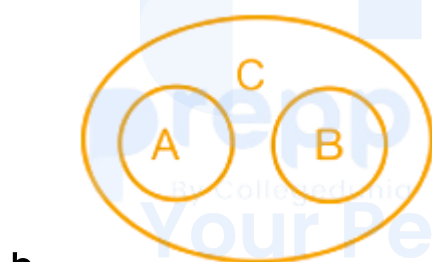
d. 7

61. Which of the following Venn diagrams correctly represents the relationship between the following words? (+1, -0.33)

A. Walking

B. Swimming

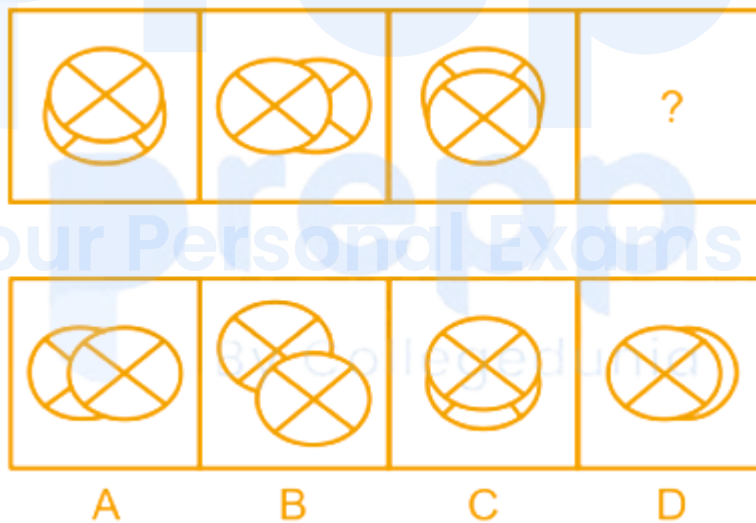
C. Exercise



62. Two inlet pipes A and B can fill an empty cistern in 22 and 33 hours respectively. They start work together but pipe A had to be closed 5.5 hours before the cistern was full. How many hour in all did it take the two pipes to fill the cistern? (+1, -0.33)
- a. 16
 - b. 16.5
 - c. 19.25
 - d. 16.2

63. Select the option figure that will complete the series of question figures. (+1, -0.33)

Option Figures:



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

64. Which of the following is NOT the neighbouring state of West Bengal? (+1, -0.33)

- a. Sikkim
- b. Odisha
- c. Jharkhand
- d. Meghalaya

65. The cerebellum is concerned with _____. (+1, -0.33)

- a. Remembering and hunger
- b. Coordination of muscular movement
- c. All involuntary actions
- d. Thinking

66. Who won the 2016 Lata Mangeshkar Award For Lifetime Achievement? (+1, -0.33)

- a. Uttam Singh
- b. Preetam Singh
- c. Arijit Singh
- d. Bappi Lahiri

67. An object of mass 10 kg is moving with a velocity of 2 ms^{-1} . The momentum possessed by the body is _____. (+1, -0.33)

- a. 30 kg.m/s
- b. 5 kg.m/s
- c. 10 kg.m/s
- d. 20 kg.m/s

68. Arab merchants shipped Indian goods to _____ countries through the Red Sea and the Mediterranean ports. (+1, -0.33)

- a. Australian
- b. European
- c. African
- d. American

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

- A. Clip
 - B. Pin
 - C. Band
 - D. Towel
-
- a. D
 - b. B
 - c. C
 - d. A

70. An object travels 25 m in 4 s and then another 15 m in 2 s. What is the average speed of the object? (+1, -0.33)

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

71. Raghav's age after 11 years will be 5 times his age 5 years back. What is Raghav's present age? (+1, -0.33)

- a. 7 years
- b. 4 years
- c. 8 years
- d. 9 years

72. Select the horizontal mirror image of REST from the given option figures? (+1, -0.33)

Option figures.



- a. B
- b. A

c. D

d. C

73. 'When elements are arranged in the order of increasing atomic masses, the atomic mass of the middle element is roughly the average of the atomic masses of the other two elements'. This law is known as

(+1, -0.33)

-----.

a. Dobereiner's law of triads

b. Mendeleev's law

c. Newlands law of octaves

d. Newton's law

74. If $a : b = \frac{3}{2} : \frac{7}{3}$ and $b : c = \frac{1}{5} : \frac{1}{7}$ then find $a : b : c$.

(+1, -0.33)

a. 14 : 9 : 10

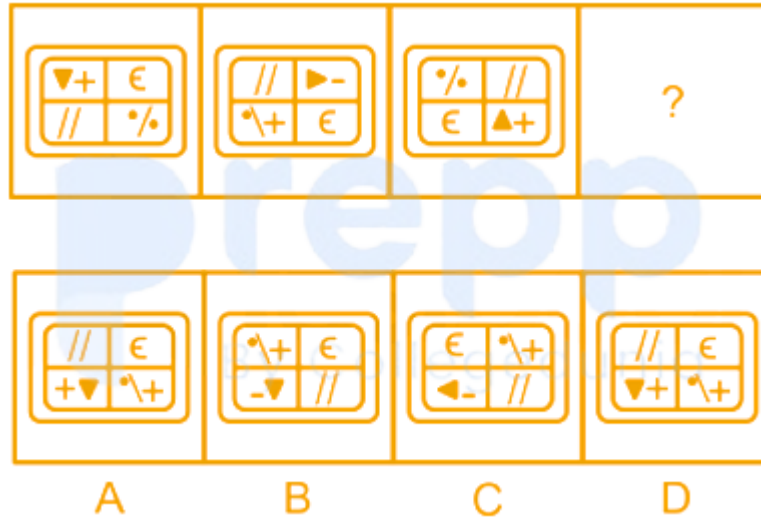
b. 9 : 14 : 10

c. 10 : 9 : 14

d. 4 : 5 : 7

75. Which of the option figures follows next in the series on question figures?

(+1, -0.33)



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

76. The Prime Minister of India cannot participate in voting on a non-confidence motion against her/his government if she/he -----.

(+1, -0.33)

- a. Is a member of Rajya sabha
- b. Is in majority
- c. Is a member of Lok Sabha
- d. Forbidden by opposition parties of Lok Sabha

77. Who launched "Move Hack", global mobility hackathon to crowdsource solutions for the future of mobility in India?

(+1, -0.33)

- a. Startup India

- b. Startup Village
 - c. Standup India
 - d. NITI Aayog
-

78. Z and L go for jogging in a park that has a square jogging track. Z jogs at the same pace as L. They jog in opposite directions. If they start jogging East-West direction. Half way through in which direction they will meet again? (+1, -0.33)

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

79. Which among the following actors won the Best Actor (Male) award at the 18th IIFA Awards held in 2017? (+1, -0.33)

- a. Shahid Kapoor
 - b. Arjun Kapoor
 - c. Aamir Khan
 - d. Salman Khan
-

80. $\{(99 - 1)/7^2\} \times 2 + 8 = ?$ (+1, -0.33)

- a. 10

b. 13

c. 11

d. 12

81. Which Indian personality was honored with the 2017 Carnegie Medal of Philanthropy? (+1, -0.33)

a. Anil Ambani

b. Ness Wadia

c. Ratan Tata

d. Azim Premji

82. At a given temperature, the speed of sound is maximum in _____. (+1, -0.33)

a. Steel

b. Nickel

c. Iron

d. Aluminium

83. Pointing to a photograph, Neel says he is the son of the only daughter of the father of my sister. Whom is he pointing at? (+1, -0.33)

a. Nephew

b. Friend

- c. Cousin
- d. Niece

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

Statement: "We are all victims of our thoughts," says a title in a newspaper column.

Assumptions:

- I. Our actions are based on our thoughts.
- II. Newspapers are the best source of information.

- 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

85. The effect of Thrust depends on which of the following? (+1, -0.33)

- a. Area
- b. Volume
- c. Mass
- d. Weight

86. Between 5^2 and 6^2 there are _____ non-perfect square numbers. (+1, -0.33)

- a. 11
 - b. 6
 - c. 12
 - d. 10
-

87. A student has to secure 40% marks to pass. He obtains 40 marks and fails by 40 marks. What are the maximum marks obtainable? (+1, -0.33)

- a. 400
 - b. 250
 - c. 200
 - d. 500
-

88. Pipe A can fill an empty cistern in 6.8 hours. Pipe B can fill it up in 10.2 hours. Only Pipe B is turned on for 1.7 hours after which Pipe A is also tuned on. How much time will it take in all to fill up the cistern? (+1, -0.33)

- a. 5 hours 6 minutes
 - b. 5 hours 12 minutes
 - c. 5 hours 5 minutes
 - d. 5 hours 10 minutes
-

89. Vinita and Nikita are sisters. Vinay is the son of Nikita's father's sister. How is Vinay related to Vinita? (+1, -0.33)

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

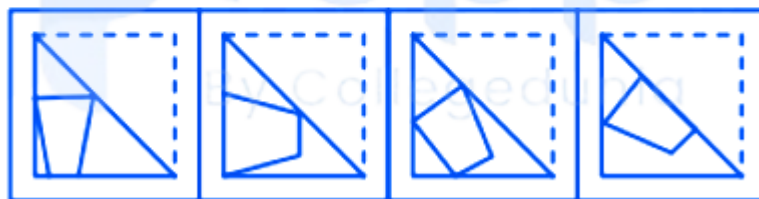
90. A 153 m long train crosses a 747 m long bridge in 40.5 seconds. What is the speed of the train? (+1, -0.33)

- a. 80 km/h
 - b. 70 km/h
 - c. 75 km/h
 - d. 85 km/h
-

91. In a code language, JAIL is written as 9081. What is the code for PRISON? (+1, -0.33)

- a. 578843
 - b. 598843
 - c. 579843
 - d. 578943
-

92. Which pattern will the given transparent sheet resemble when it is folded at the dotted line? (+1, -0.33)



A

B

C

D

a. C

b. D

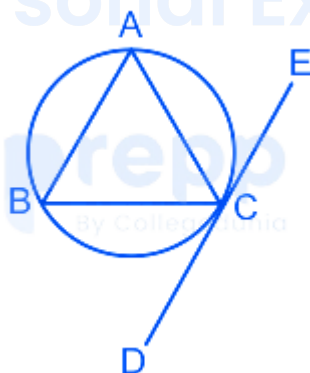
c. B

d. A

93. If $\angle BCD = 82^\circ$, then $\angle BAC = ?$

(+1, -0.33)

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a. 85°

b. 82°

c. 83°

d. 77°

94. A ball thrown up vertically returns to the ground after 12.5 second. Find the velocity with which it was thrown up? ($g = 10 \text{ ms}^{-2}$) (+1, -0.33)

a. 62.5 ms^{-1}

b. 65 ms^{-1}

c. 12.5 ms^{-1}

d. 10 ms^{-1}

95. $\frac{0.16 \times 1.65}{0.075 \times 0.02^2} = ?$ (+1, -0.33)

a. 7500

b. 8800

c. 8400

d. 8000

96. Plant cell wall is made up of _____. (+1, -0.33)

a. Chitin

b. Cellulose and pectin

c. Pectin only

d. Murein

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

Statement:

"Meneka has a beautiful house," said Ranjan to Lata.

Conclusions:

I. Ranjan is a civil contractor

II. Lata is fond of houses

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

98. The momentum of a body of mass 200g with kinetic energy of 10 J is (+1, -0.33)

- a. 3 kg m/s
- b. 2 kg m/s
- c. 5 kg m/s
- d. 0.33 kg m/s

99. n = number of times the wheel of a bus will rotate to cover a distance of 99 km. if the diameter of the wheel is 63 cm, then find the value of n . (+1, -0.33)

- a. 45,000

- b. 35,000
- c. 40,000
- d. 50,000

100. Two men X and Y walk from P to Q a distance of 21 km at 3 and 4 km an hour respectively. Y reaches Q returns immediately and meets X at R, the distance from P to R is (+1, -0.33)

- a. 18 km
- b. 17 km
- c. 16 km
- d. 17.5 km

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Answers

1. Answer: c

Explanation:

$$\begin{aligned}\frac{5}{11} + \frac{11}{5} \\&= \frac{25 + 121}{55} \\&= \frac{146}{55}\end{aligned}$$

2. Answer: c

Explanation:

The Correct Answer is Option 3 i.e Chetan Bhagat.

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Author	Books
Sashi Tharoor	• The Great Indian Novel • An Era of Darkness • Pax Indica • The Paradoxical Prime Minister
<u>Chetan Bhagat</u>	• Five Point Someone • One Night at the Call Center • The 3 Mistakes Of My Life • 2 States • Revolution 2020 • Half Girlfriend
Vinod Chopra	• Lage Raho Munna Bhai: The Original Screenplay
Rajdeep Sardesai	• 2019: How Modi Won India • Democracy's XI • Newsman: Tracking India in the Modi Era

3. Answer: a

Explanation:

The Correct Answer is Option 1 i.e Baking powder.

- Baking powder:
 - Baking powder is a mixture of baking soda and tartaric acid .

- Tartaric acid has been added to baking powder to neutralize the bitterness produced by sodium bicarbonate (NaHCO_3) .
- **Baking soda :**
 - It is commonly known as sodium bicarbonate.
 - Sodium bicarbonate is a white crystalline solid.
 - It is used in baking products like cakes, cookies etc.
- **Washing Soda :**
 - It is commonly known as Na_2CO_3 or sodium carbonate.
 - It is used in softening of hard water.
 - It is commonly used as a agent for domestic purposes.It is also used in the manufacturing of paper, soap, textiles, paints, etc.
- **Vinegar :**
 - Vinegar is produced from fermentation of alcohol.
 - Vinegar is the natural source for acetic acid.
 - It is widely used as a flavouring agent in most of the cuisines.

4. Answer: a

Explanation:

Suppose the number is X:

According to question

$$63\% \text{ of } X = 315$$

$$\Rightarrow (63/100) \times X = 315$$

$$\Rightarrow X = (315/63) \times 100$$

$$\Rightarrow X = 500$$

Hence, the number is 500.

5. Answer: a

Explanation:

The pattern followed here is:

$$2 \times 9 = 18$$

$$18 \times 9 = 162$$

$$162 \times 9 = 1458$$

Hence, '1458' is the correct answer.

6. Answer: a

Explanation:

The Correct Answer is Option 1 i.e Germanium.

- Germanium (Ge):
 - Atomic number is 32.
 - Germanium is most widely used as a Semiconductor.
 - Germanium is used in transistors and in integrated circuits.
 - Germanium is also used as an alloying agent.
 - Eka-silicon is known as Germanium.
- Gallium (Ga):
 - Atomic number is 31.
 - It is used in electronic circuits, semiconductors and light-emitting diodes (LEDs).
 - Eka aluminium is known as gallium.
- Silicon (Si):
 - Atomic number is 14.
 - It is widely used as a semiconductor.
 - It is the second most abundant element in the crust.
- Aluminium (Al):
 - Atomic number is 13.
 - It is soft, malleable and ductile.

- It has high thermal and electrical conductivity
- It has excellent corrosion resistance.
- It is the most abundant metal in the Earth's crust.
- It is widely used for foil, kitchen utensils and conductor cables etc.

7. Answer: a

Explanation:

The Correct Answer is Option 1 i.e Delhi Acers.

- Delhi Acers team won the 2016 Premier Badminton League (PBL) title against Mumbai Rockets.
 - The season was held from 2–17 January 2016.
 - This is the second edition of the Premier Badminton League.
 - The second edition was renamed from the Indian Badminton League to the Premier Badminton League.
- Chennai Smashers won the 2017 Premier Badminton League (PBL) against Mumbai Rockets.
- Hyderabad Hunters won the 2017–18 edition of PBL against Bangalore blasters.
- Bangalore Raptors won the 2020 edition of PBL against Northeastern Warriors.

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8. Answer: c

Explanation:

Right circular cone:

Altitude = h and radius = r

Given, radius of the base is the same as five-ninths of its altitude:

$$\therefore r = 5h/9$$

$$\Rightarrow h = 9r/5$$

Volume of a right circular cone = $\pi/3 \times r^2 \times h$

$$= \pi/3 \times r^2 \times 9r/5$$

$$= 3\pi/5 \times r^3$$

And

Volume of sphere of radius R = $4\pi/3 \times R^3$

Since the volumes of two figures are equal:

$$3\pi/5 \times r^3 = 4\pi/3 \times R^3$$

$$\Rightarrow r^3/R^3 = 20/9$$

$$\Rightarrow r^3/R^3 = 60/27$$

$$\Rightarrow r : R = \sqrt[3]{60} : 3$$

9. Answer: b

Explanation:

The Correct Answer is Option 2 i.e Mirabai Chanu.

- **Mirabai Chanu:**
 - She is an Indian weight lifter from Manipur.
 - She was the only second Indian after Karnam Malleswari to win a gold medal at the World Weightlifting Championships.
 - **She won the gold medal in women's 48 kg category at the 2017 World Championship being held in Anaheim, USA.**
- **Thunya Sukcharoen:**
 - She is an Thai weightlifter.
 - Thailand's Sukcharoen Thunya won the silver medal at the 2017 World Championship being held in Anaheim, USA.
- **Segura Ana Iris:**

- She is from Colombia.
- Segura Ana Iris bagged the bronze medal at the 2017 World Championship being held in Anaheim, USA.
- **Karnam Malleswari:**
 - She is a retired Indian weightlifter.
 - She became the first Indian woman to win a medal at the Olympics in Sydney 2000.
 - She also became the first Indian woman to become a weightlifting World Champion in 1994 in Istanbul.

10. Answer: b

Explanation:

All options except 'rack' are things which can be opened and closed.

Term	Explanation
Rack	a framework, typically with rails, bars, hooks, or pegs, for holding or storing things.
Window	an opening in the wall or roof of a building or vehicle, fitted with glass in a frame to admit light or air and allow people to see out.
Door	a hinged, sliding, or revolving barrier at the entrance to a building, room, or vehicle, or in the framework of a cupboard.
Shutter	each of a pair of hinged panels fixed inside or outside a window that can be closed for security or privacy or to keep out the light.

Hence, 'rack' is the correct answer.

11. Answer: c

Explanation:

CONCEPT:

- Refractive index/Absolute refractive index: The ratio of the speed of light in air/vacuum to the speed of light in the medium is called the refractive index of that medium.
 - It is generally denoted by μ or n . It is a **dimensionless quantity**.

$$\text{Refractive index} = \frac{\text{speed of light in air}}{\text{speed of light in medium}}$$

- The absolute refractive index can never be less than 1.

EXPLANATION:

- The **absolute refraction index of the diamond is 2.42**. It is the experimental data. So option 3 is correct.

12. Answer: d

Explanation:

The Correct Answer is Option 4 i.e Banabhatta.

- **Fa-Hien:**
 - He is a Chinese traveler who visited India during the reign of Chandra Gupta II.
 - He didn't mention the name of the king in his accounts.
 - Fa-Hien provides valuable information on the socio, economic, and religious conditions of the Gupta empire.
- **Ramcharitmanas:**

- Tulsidas is the author of an epic Ramcharitmanas (a story of Lord Rama)
 - It was written in Awadhi language.
 - **Rajatarangini:**
 - Rajatarangini is a book written by Kalhana.
 - It gives an account of the history of Kashmir.
 - It was written in the Sanskrit language.
 - **Harshacharita:**
 - Harshacharita is a book written by Banabhatta.
 - It was written in the Sanskrit language.
 - **It gives us accurate information about Harsha and his administration.**
-

13. Answer: c

Explanation:

The pattern followed here is:

$$1^3 = 1$$

$$2^3 = 8$$

$$3^3 = 27$$

$$5^3 = 125$$

$$7^3 = 343$$

$$11^3 = 1331$$

Here, the prime numbers have been cubed in an increasing order.

Hence, '343' is the correct answer.

14. Answer: b

Explanation:

The Correct Answer is Option 2 i.e Radha Mohan Singh.

- **Piyush Goyal:**
 - As of May 2020, he is the current Minister of Railways and Minister of Commerce & Industry in the Government of India.
 - He is a Member of the Upper House of the Parliament of India (Rajya Sabha) and the Deputy Leader of Rajya Sabha.
 - He received the 4th Annual Carnot Prize in 2018 recognising the pathbreaking transformations in India's energy sector.
- **Arun Jaitley:**
 - He was the former Ministry of Finance, and the Ministry of Corporate Affairs, Government of India (2014–2019).
 - He was also the Minister of Defence (2014 & 2017) and the Minister of Information and Broadcasting, Government of India (2014–2016).
 - He was posthumously awarded the Padma Vibhushan in 2020 in the field of Public Affairs.
- **Radha Mohan Singh:**
 - **As of August 2018, he is the union minister of Agriculture and Farmers Welfare.**
 - He was currently the chairperson for Parliamentary Standing committee on Railways.
 - As of May 2020, Narendra Singh Tomar is the union minister of Agriculture & Farmers Welfare.
- **J.P. Nadda:**
 - As of May 2019, Nadda is the Union Minister of Health and Family Welfare.
 - He is the National President of the Bharatiya Janata Party since 20th January 2020.
 - As of May 2020, Dr. Harsh Vardhan is the Union Minister of Health and Family Welfare.

15. Answer: c

Explanation:

The Correct Answer is Option 3. i.e. Pokhran.

- **Pokhran:**
 - India tested its first nuclear device in Pokhran, Rajasthan in the year 1974.
 - 'Smiling Buddha' was the code name of India's first successful nuclear bomb test.
 - With the Smiling Buddha, India became the sixth nuclear power in the world after the United States, Soviet Union, Britain, France, and China to successfully test out a nuclear bomb.
- **Sriharikota :**
 - It is located in the Nellore district in Andhra Pradesh.
 - Satish Dhawan Space Centre (SDSC) SHAR in Sriharikota is the Spaceport of India.
 - It is one of the two satellite launch centers in India
- **Kalpakkam :**
 - It is situated on the Coromandel Coast of Chennai, Tamil Nadu.
 - Kalpakkam Nuclear Power Plant in Tamil Nadu first began operating in 1984
- **Tarapur :**
 - It is located in the state of Maharashtra:
 - Tarapur Atomic Power Station was the first commercial nuclear power station built in India, commissioned in 1969.

16. Answer: b

Explanation:

Let us observe the pattern of 1st and 2nd figure.

Here, the second figure is the mirror image of the first figure when a mirror is placed to the right of the first figure.



Similarly, the fourth figure will be the mirror image of the third figure when a mirror will be placed to the right of the third figure.



Hence, figure 'C' is the correct answer.

17. Answer: c

Explanation:

$$\sqrt{4.2436}$$

Since

$$4.0000 < 4.2436 < 4.4100$$

So,

$$2.00 < \sqrt{4.2436} < 2.10$$

So, option 2 and 4 are eliminated.

Now, we can get the correct option by simply squaring it

$$(2.06)^2 = 4.2436$$

$$\text{And, } (2.04)^2 = 4.1616$$

Hence, option 3 is correct.

18. Answer: c

Explanation:

Solution has 60 g common salt and 340 g water

$\therefore$ Total mass of the solution = 60 + 340 = 400 g

$\therefore$ Concentration of salt in terms of mass = $[60/400] \times 100 = 15\%$

19. Answer: a

Explanation:

The correct answer is 3.

★ Key Points

- Benzene is an aromatic compound with molecular formula C_6H_6 .
- It is planar hexagonal in shape with bond angles of 120° .
- Three double bonds and nine single bonds are present in one molecule of benzene.



20. Answer: a

Explanation:

The Correct Answer is Option 1. i.e. Kalanithi Maran.

- **Kalanithi Maran:**
 - He is the chairman and founder of the Sun Group.
 - Sun TV Network was launched by Kalanithi Maran in 1993.
 - Sun TV Network is an Indian media company headquartered in Chennai, Tamil Nadu.
 - Sun TV Network operates satellite television channels in Tamil, Telugu, Kannada, and Malayalam, airs FM stations across India and owns the SunRisers Hyderabad cricket franchise of IPL
 - He started a monthly magazine Poomalai in the year 1990.
 - Forbes magazine named him the "Television king of southern India".
- **Rakesh Jhunjhunwala :**
 - He is often referred to as India's own Warren Buffet.
 - He is an Indian investor, trader, and chartered accountant.
 - He is the chairman of Hungama Media and Aptech Ltd.
- **Vikas Oberoi :**
 - He is Chairman/Managing Director at Oberoi Realty Ltd.
- **Dr. Ranjan Pai :**
 - He is the Chairman of the Manipal Education and Medical Group (MEMG).
 - He received the Padma Bhushan in the year 2011.
 - He received the Golden Peacock Lifetime Achievement Award for the Year 2011.

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21. Answer: d

Explanation:

1. Mis 25 years old today.

Here, there is no reference to S.

Therefore, Statement I alone is not sufficient.

2. Sis younger to M by 10 years

Here, we need to know the age of M to deduce the age of S.

Therefore, Statement 2 alone is not sufficient.

Combining 1 and 2, we get:

$$S = M - 10 \text{ and } M = 25 \text{ years.}$$

$$\text{So, S's age} = 25 - 10 = 15 \text{ years.}$$

So, both 1 and 2 statements are required to answer the question.

Hence, 'statements 1 and 2 together are necessary' is the correct answer.

22. Answer: b

Explanation:

We can directly find the square roots of all the numbers and the number whose square root is not an integer will be our answer.

$$\sqrt{13225} = 115$$

$$\sqrt{18025} = 134.25$$

$$\sqrt{15625} = 125$$

$$\sqrt{21025} = 145$$

Hence, the number 18025 will have an irrational square root.

23. Answer: c

Explanation:

Combining statements 1 and 3, we can arrange in the shortest to tallest order"

$$T < _ < _ < F$$

Remaining- K and M

Since there is no given relationship between K and M, we get two cases:

Case 1:

$$T < K < M < F$$

Case 2:

$$T < M < K < F$$

Thus, there is no way of concluding who is standing in the second place if we arrange shortest to tallest. Hence, the statements are insufficient.

Hence, 'The statements are insufficient' is the correct answer.

24. Answer: b

Explanation:

Let the number of red balls be $15x$

Let the number of green balls be $26x$

When 12 more green balls are added, the number of green balls become $= 26x + 12$

The new ratio of red balls to green balls $= 1 : 2$

$$\frac{15x}{26x+12} = \frac{1}{2}$$

$$2 \times 15x = 1 \times (26x + 12)$$

$$30x = 26x + 12$$

$$30x - 26x = 12$$

$$4x = 12$$

$$x = 3$$

Therefore, the number of red balls in the bag $= 15x = 15 \times 3 = 45$

Hence, '45' is the correct answer.

25. Answer: d

Explanation:

The Correct Answer is Option 4 i.e Self-pollination.

- **Self-pollination:**
 - The transfer of pollen grains from anther to the stigma of the same flower is called self pollination.
 - **Mendel obtained F2 progeny from F1 generation plants by the method of self pollination.**
- **Cross pollination:**
 - The transfer of pollen grains from anther of one flower to the stigma of another flower is called cross pollination.
- **Vegetative propagation:**
 - It is a form of asexual reproduction of a plant where in new plant grows from a fragment of the parent plant.
- **Asexual reproduction:**
 - Asexual reproduction produces plants that are genetically identical to the parent plant.
 - In asexual reproduction there is no fusion of male and female gametes takes place.

26. Answer: d

Explanation:

From the graph:

CO₂ concentration in the year 1995 = 360

CO₂ concentration in the year 2015 = 400

Hence,

$$\text{Percentage change} = [(400 - 360)/360] \times 100$$

$$= 400/36$$

$$= 11.11\%$$

27. Answer: a

Explanation:

The Correct Answer is **Option 1** i.e **more reactive than copper**.

- Zinc is more reactive than copper metal and so it can displace copper from copper sulphate solution.
- Zinc displaces the metals present below it in the series.
- Reactivity of an element decreases from top to bottom in the given reactivity series.
 - Potassium (K)
 - Sodium (Na)
 - Calcium (Ca)
 - Magnesium (Mg)
 - Aluminium (Al)
 - **Zinc (Zn)**
 - Chromium (Cr)
 - Iron (Fe)
 - Lead (Pb)
 - Hydrogen (H)
 - **Copper (Cu)**
 - Silver (Ag)
 - Gold (Au)

28. Answer: d

Explanation:

The Correct Answer is Option 4 i.e Jhulan Goswami.

- **Charlotte Edwards:**
 - She was an English former professional cricketer who was captain of the England women's team.
 - She has won the ICC Women's player of the year 2008.
 - She was also named as one of Wisden's five Cricketers of the Year 2014.
- **Dane van Niekerk:**
 - She is a South African cricketer.
 - She has been the South Africa's Women's team captain in all three forms since June 2016.
- **Meg Lanning:**
 - She is the current captain of the Australian women's national cricket team.
 - She became the first Australian, male or female, to score 2,000 runs in Twenty20 Internationals.
- **Jhulan Goswami:**
 - She is the former captain of India's national women's cricket team.
 - She was awarded the ICC Women's Player of the Year award in 2007.
 - She became the first bowler to take 200 wickets in WODIs.
 - She was also awarded the Padma Shri in the year 2012.
 - She was also awarded the Arjuna Award in the year 2010.

29. Answer: c

Explanation:

The Correct Answer is Option 3 i.e BrahMos.

- **BrahMos:**
 - Indian Navy in 2017 successfully test-fired the 290-km strike range Brahmos supersonic cruise missile.

- BrahMos is a medium-range supersonic cruise missile.
- It can be launched from ships, aircraft, or land.
- It is being developed through a collaboration between India and Russia.
- **Agni:**
 - Agni missiles are a series of medium to intercontinental range ballistic missiles developed by India.
 - Agni missiles are nuclear weapons capable missiles.
 - These are surface to surface ballistic missiles.
- **K9 vajra:**
 - It is a tracked self-propelled howitzer gun.
 - It can turn around at zero radii.
- **GSAT 17:**
 - It is an Indian geostationary communications satellite.
 - It was launched on June 29, 2017 from Kourou, French Guiana by Ariane-5 VA-238.
 - GSAT-17 was launched into a Geosynchronous Transfer Orbit (GTO) by Ariane-5 VA-238 launch vehicle.

30. Answer: d

Explanation:

The Correct Answer is Option 4 i.e. Kerala.

- The pre-monsoon rains are also known as April rains or summer rains.
- **Mango showers** are the name of the pre-monsoon showers in Kerala and some parts of Karnataka, these rains help in the early ripening of mangoes.
- They are also known as 'Kaal Baisakhi' in Bengal, as Bardolli Chhera in Assam and as Cherry Blossom showers or Coffee Showers in Kerala.
- **Odisha :**
 - Jharkhand, West Bengal, Andhra Pradesh and Chhattisgarh are the boundaries of Odisha.
 - Bhubaneswar is the capital of Odisha.
 - Naveen Patnaik is the CM of Odisha.
- **Uttar Pradesh :**

- It shares a boundary with a maximum number of Indian states.
- It shares its border with Uttarakhand, Himachal Pradesh, Haryana, Rajasthan, Madhya Pradesh, Chhattisgarh, Jharkhand, Bihar as well as Delhi.
- Yogi Adityanath is the CM of Uttar Pradesh.
- **Gujarat :**
 - Gandhinagar is the capital city of Gujarat.
 - It has the longest Coastline in India.
 - The city of Anand, located in Gujarat is commonly known as the Milk Capital of India.
 - Bhupendra Patel is the current Chief Minister of the state.

31. Answer: d

Explanation:

If $2x^2 + ax + 2b$, when divided by $x - 1$, leaves a remainder of 16.

Putting $(x = 1)$ in the equation $2x^2 + ax + 2b$, it will be equal to 16

$$\Rightarrow 2 + a + 2b = 16$$

$$\Rightarrow a + 2b = 14 \quad \text{---- (1)}$$

And

$x^2 + bx + 2a$, when divided by $x + 1$, leaves a remainder of -1.

Putting $(x = -1)$ in the equation $x^2 + bx + 2a$, it will be equal to -1;

$$\Rightarrow 1 - b + 2a = -1$$

$$\Rightarrow 2a - b = -2 \quad \text{---- (2)}$$

Multiply equation 2 by 2 and add in equation 1:

$$\Rightarrow 5a = 10$$

$$\Rightarrow a = 2$$

And from equation 1:

$$b = 6$$

Hence,

$$(a + b) = 2 + 6 = 8$$

32. Answer: b

Explanation:

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

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

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

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

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

$$104 \div [68 - \{29 - (45 - 56 \div 7 \times 4)\}] = ?$$

$$\Rightarrow ? = 104 \div [68 - \{29 - (45 - 8 \times 4)\}]$$

$$\Rightarrow ? = 104 \div [68 - \{29 - 13\}]$$

$$\Rightarrow ? = 104 \div [68 - 16]$$

$$\Rightarrow ? = 104 \div 52$$

$$\Rightarrow ? = 2$$

33. Answer: a

Explanation:

The Correct Answer is Option 1. i.e 4.

- In the modern periodic table, elements having atomic numbers 19 to 36 are placed in the period 4.
 - They are K(19), Ca(20), Sc(21), Ti(22), V(23), Cr(24), Mn(25), Fe(26), Co(27), Ni(28), Cu(29), Zn(30), Ga(31), Ge(32), As(33), Se(34), Br(35), Kr(36)
- In the modern periodic table, elements having atomic numbers 55 to 86 are placed in the period 6.
- In the modern periodic table, elements having atomic numbers 37 to 54 are placed in the period 5.
- In the modern periodic table, elements having atomic numbers 11 to 18 are placed in the period 3.

34. Answer: b

Explanation:

$$a + \frac{1}{a} = -6$$

Taking cube both sides:

$$\Rightarrow a^3 + \frac{1}{a^3} + 3 \times a \times \frac{1}{a} \left[a + \frac{1}{a} \right] = -216$$

$$\Rightarrow a^3 + \frac{1}{a^3} + 3 \times 1 \times -6 = -216$$

$$\Rightarrow a^3 + \frac{1}{a^3} = -216 + 18$$

$$\Rightarrow a^3 + \frac{1}{a^3} = -198$$

35. Answer: c

Explanation:

The option figure that bears the closest resemblance to the question figure is shown below:



The answer figure A is like mirror image of the question. Also, it is the only figure among the answer figures that has three intersecting lines in it, similar to that of question figure.

Hence, 'figure A' is the correct answer.

36. Answer: c

Explanation:

A and B can complete a task in 50 days, B and C can complete it in 37.5 days while C and A can do the same task together in 30 days.

Suppose Efficiencies of A, B and C are a, b and c respectively;

Suppose total work = 150 units (LCM of 50, 37.5 and 30)

So,

$$a + b = 150/50 = 3 \text{ units}$$

$$b + c = 150/37.5 = 4 \text{ units}$$

$$c + a = 150/30 = 5 \text{ units}$$

Adding all three:

$$(a + b + c) = (3 + 4 + 5)/2 = 6 \text{ units}$$

Hence,

$$c = 6 - 3 = 3 \text{ units}$$

$$a = 6 - 4 = 2 \text{ units}$$

$$b = 6 - 5 = 1 \text{ units}$$

Now,

$$\text{Time in which A can complete the task alone} = 150/2 = 75 \text{ days}$$

$$\text{Time in which A can complete the task alone} = 150/1 = 150 \text{ days}$$

$$\text{Time in which A can complete the task alone} = 150/3 = 50 \text{ days}$$

37. Answer: c

Explanation:

The correct answer is Option 3, i.e $9 \times 10^8 \text{ J}$

- 1 unit of energy is equal to 1 kilowatt hour (kWh)
- We also know that
- $1 \text{ kWh} = 3.6 \times 10^6 \text{ J}$
- Therefore, 250 units of energy = $250 \times 3.6 \times 10^6 = 9 \times 10^8 \text{ J}$.

38. Answer: b

Explanation:

$$x = \frac{4}{3}$$

$$\Rightarrow 3x = 4$$

$$\Rightarrow (3x - 4) = 0$$

And

$$x = \frac{-3}{7}$$

$$\Rightarrow 7x = -3$$

$$\Rightarrow (7x + 3) = 0$$

Hence,

The equation is: $(7x + 3) (3x - 4) = 0$

39. Answer: c

Explanation:

The Correct Answer is Option 3 i.e Arts.

- Usha Uthup:
 - She is a famous Indian pop and playback singer, currently a resident of West Bengal.
 - She won the **Padma Shri Award** in the field of Arts in the year 2011.
 - She also received the Rajiv Gandhi Purashkar for national integration for quality music.

40. Answer: d

Explanation:

The Correct Answer is Option 4 i.e Odisha.

- Pyarimohan Mohapatra :

- He was a former member of Parliament from Odisha.
- He died at a Mumbai hospital in the year 2017.
- Once upon a time, he was considered as the mastermind and the proxy leader of the Biju Janata Dal for more than two decades.
- Naveen Patnaik is the current CM of Odisha.
- **Assam :**
 - Bangladesh, Bhutan, Nagaland, Arunachal Pradesh, Manipur, Mizoram, Tripura, Meghalaya and West Bengal are the boundaries of the state Assam.
 - Dispur is the capital of Assam.
 - Sarbananda Sonowal is the CM of Assam.
- **West Bengal :**
 - Kolkata is the capital of West Bengal.
 - Jharkhand, Odisha Bihar, Bangladesh, Assam, Sikkim and Bhutan and Nepal are boundaries of West Bengal.
 - Mamata Banerjee is the CM of West Bengal.
- **Bihar :**
 - It is bordered by Nepal, Uttar Pradesh, Jharkhand and West Bengal.
 - Patna is the capital of Bihar.
 - Nitish Kumar is the present CM of Bihar.

41. Answer: d

Explanation:

The Correct Answer is Option 4 i.e Ca and P.

- The bone cells are known as osteocytes which are embedded in a hard matrix that is composed of Calcium (Ca) and phosphorus (P) compounds.
- **Calcium (Ca):**
 - It provides strength to bones and teeth with vitamins.
 - It also plays an important role in blood formation, muscle contraction, clotting of blood, etc.
 - Milk, eggs, fish, etc. are the main sources of calcium.
- **Phosphorous (P):**

- It provides strength to bones and teeth, in coordination with calcium.
- Milk, cheese, green leafy vegetables, etc. are the main sources of Phosphorus.
- **Sodium (Na):**
 - It is normally found in the external fluid of a cell.
 - It helps in the functioning of contraction of muscles, in the transmission of nerve impulses in nerve fiber, etc.
 - Normal salt, meat, eggs, etc. are the main sources of sodium.
- **Fluorine (F):**
 - It is the most electronegative element.
 - Fluorine protects us from dental decay.
 - Food, together with drinking water, is the main source of fluorine for human beings.
 - Fluorine is essential for the maintenance of solidity of our bones.

42. Answer: a

Explanation:

Symbol	<	×
Meaning	+	÷

Thus, $((25 < 15)) \times 4) < 1$ will be decoded as $((25 + 15)) \div 4) + 1$

Solving

$$((25 + 15)) \div 4) + 1)$$

$$= ((40)) \div 4) + 1$$

$$= (10) + 1$$

$$= 11$$

Hence, '11' is the correct answer.

43. Answer: d

Explanation:

Money invested last year = Rs. 20,000

Formula

Increment value = Current value $\times$ (Percentage/100)

Calculation

Increase in investment = $20,000 \times (30/100) = \text{Rs. } 6,000$

$\therefore$ Total investment of this year = $20,000 + 6,000 = \text{Rs. } 26,000$

44. Answer: d

Explanation:

The Correct Answer is Option 4 i.e 2.5.

- **Power:**
 - The rate of doing work is called power.
 - Its SI unit is watt.
 - 1 kilowatt (kW) is equal to 1000 Watts.
 - 1 megawatt is equal to 1000000 Watts
 - 2.5 kilowatt (kW) is equal to 2500 Watts.
-

45. Answer: b

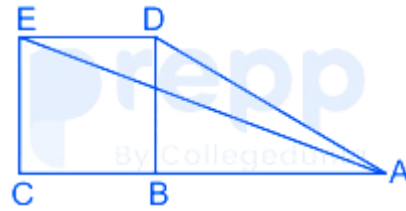
Explanation:

The Correct Answer is Option 2. i.e. Nichrome.

- **Aluminium :**
 - Atomic number is 13.
 - It is soft, malleable, and ductile.
 - It has high thermal and electrical conductivity
 - It has excellent corrosion resistance.
 - It is the most abundant metal in the Earth's crust.
 - It is widely used for foil, kitchen utensils, and conductor cables, etc.
- **Nichrome:**
 - It is also known as nickel chrome.
 - It is an alloy produced by mixing nickel, chromium.
 - It is widely known for its heat resistance.
 - It is also well resistant to both corrosion and oxidation.
 - **It is commonly used in electrical heating devices.**
- **Copper :**
 - It is a soft, malleable, and ductile metal.
 - It has a very high thermal and electrical conductivity.
 - The copper metal turns green in color because of an oxidation reaction.
 - Atomic number: 29.
- **Iron :**
 - It is a silvery-white or grayish metal.
 - It is ductile and malleable.
 - Wrought Iron is the purest form of iron.
 - Iron is the fourth most abundant element in the Earth's crust.
 - The atomic number is 26.

46. Answer: b

Explanation:



In the figure:

The balloon was at point D when angle of elevation was 60° i.e. $\angle BAD = 60^\circ$

And

After some time, the balloon was at point E when angle of elevation was 30° i.e. $\angle CAE = 30^\circ$

$BD = CE = 692$ m (Height at which the balloon is flying)

Now in triangle ABD:

$$\tan BAD = BD/AB$$

$$\Rightarrow \tan 60^\circ = 692/AB$$

$$\Rightarrow AB = 692/\sqrt{3}$$

$$\Rightarrow AB = 692/1.73 = 400 \text{ m}$$

Now in triangle EAC:

$$\tan CAE = EC/AC$$

$$\Rightarrow \tan 30 = 692/AC$$

$$\Rightarrow AC = 692 \times \sqrt{3}$$

$$\Rightarrow AC = 692 \times 1.73 = 1197.16 \text{ m}$$

Hence,

$$\text{Distance travelled by the balloon} = ED = BC = AC - AB$$

$$= 1197.16 - 400$$

$$= 797.16 \approx 800 \text{ m}$$

47. Answer: b

Explanation:

Square root of 4356:

It is a number between 3600 (60^2) and 4900 (70^2).

Number will be between 60 and 70 whose square has last digit 6.

Possible numbers = 64 and 66

But $65^2 = 4225$

$\therefore$ 64 can't be the answer as it will be more than 65.

$\therefore$ Square root of 4356 = 66

Alternate method

We can find the right option by simply squaring each option

$$84^2 = 7056$$

$$66^2 = 4356$$

$$64^2 = 4096$$

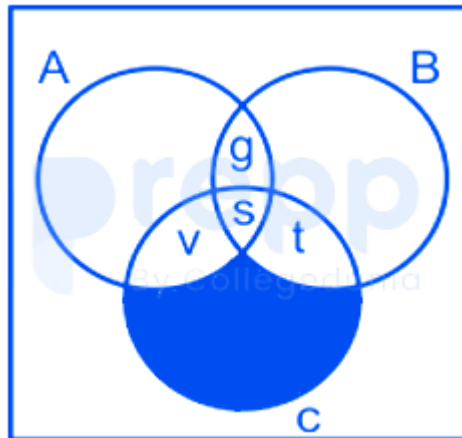
$$76^2 = 5776$$

Hence, option 2 is correct.

48. Answer: a

Explanation:

The required number will lie in the shaded part:



Therefore, Only hardworking but not honest or efficient $\rightarrow c - (v + s + t)$

Hence, ' $c - (v + s + t)$ ' is the correct answer.

49. Answer: d

Explanation:

Trees are a type of plant. Similarly, desert is a type of land.

Hence, 'Land' is the correct answer.

50. Answer: a

Explanation:

The Correct Answer is Option 1.

- The Insolvency and Bankruptcy Code, 2016 provides a time-bound process to resolve insolvency among companies and individuals.
- Insolvency is a situation where an individual or company is unable to repay their outstanding debt.

- **Features of Insolvency and Bankruptcy Code (Amendment) Ordinance, 2018:**
 - The Ordinance provides significant relief to home buyers by recognizing their status as financial creditors.
 - The Ordinance empowers the Government to provide MSMEs with a special dispensation under the Code.
 - The Ordinance also provides for a mechanism to allow participation of security holders, deposit holders, and all other classes of financial creditors that exceed a certain number, in meetings of the Committee of Creditors, through the authorized representation.
 - The voting threshold for decisions of the committee of creditors has been lowered from 75% to 51%.

51. Answer: a

Explanation:

The logic is:

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

Word	T	I	M	E
Code	20	9	13	5

Similarly,

Word	W	A	T	C	H
Code	23	1	20	3	8

Hence, '2312038' is the correct answer.

52. Answer: c

Explanation:

The correct answer is 2.

- The maximum number of electrons present in the orbit can be calculated by using the following formula: $2n^2$, where n is the principal quantum number.
- The maximum number of electrons that can be accommodated in k shell is 2.

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Energy level (principal quantum number)	Shell letter	Capacity of electrons
1	K	<u>2</u>
2	L	8
3	M	18
4	N	32
5	O	50
6	P	72

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53. Answer: c

Explanation:

The Correct Answer is Option 3 i.e Maharashtra.

- Bihar:
 - Nitish Kumar is the present CM of Bihar.
 - Phagu Chauhan is the present Governor of Bihar.
 - Bihar is bordered by Nepal, Uttar Pradesh, Jharkhand, and West Bengal.
 - Patna is the capital of Bihar.
- Jharkhand:

- The state is bordered by Bihar, West Bengal, Odisha, Chhattisgarh, and Uttar Pradesh.
- Hemant Soren is the CM of Jharkhand.
- Ranchi is the capital of Jharkhand.
- **Gujarat:**
 - Gandhinagar is the capital city of Gujarat.
 - It has the longest Coastline in India.
 - The city of Anand, located in Gujarat is commonly known as the Milk Capital of India.
 - Acharya Devvrat is the current Governor of the state.
 - Bhupendrabhai Pate I is the current Chief Minister of the state.
 - Kakrapar nuclear power station is located in Gujarat.
- **Maharashtra:**
 - Mumbai is the capital city of Maharashtra.
 - The Gateway of India is the most famous monument and Iconic landmark located in Mumbai.
 - Eknath Shinde is the current CM of Maharashtra.
 - Bhagat Singh Koshiyari is the governor of Maharashtra.
 - Ministry of External Affairs (MEA) launched the **country's first Videsh Bhavan** on 27 August 2017.
 - Four offices of MEA in Mumbai, namely, (i) Passport Office, (ii) Office of the Protector of Emigrants, (iii) Office of the Regional Director of ICCR, and (iv) Branch Secretariat of MEA, will be integrated and functioning from the newly constructed "Videsh Bhavan".
 - The "Videsh Bhavan" is located at the Bandra Kurla Complex (BKC) in Mumbai.
 - "Videsh Bhavan" at Mumbai is the first integrated office complex of the Ministry of External Affairs established in any State of India.

54. Answer: d

Explanation:

The Correct Answer is Option 4 i.e Planaria.

- **Planaria:**
 - It is a flatworm with very simple 'eyes' that are really just eye-spots that detect light.
 - Flatworms are also called planarians.
 - They belong to the phylum Platyhelminthes.
 - They are characterized by flat bodies, they have no skeleton, no circulatory or respiratory organs, etc.
- **Ascaris:**
 - They belong to phylum Aschelminthes.
 - They are bilaterally symmetrical and triploblastic animals
 - It is a type of parasitic worm
 - Ascariasis is the most common type of roundworm infection in humans.
- **Tapeworm:**
 - They also belong to the phylum Platyhelminthes
 - They are triploblastic animals.
 - They are characterized by flat bodies, they have no skeleton, no circulatory or respiratory organs, etc.
- **Liverfluke:**
 - They also belong to the phylum Platyhelminthes.
 - They are triploblastic animals.
 - They are characterized by flat bodies, they have no skeleton, no circulatory or respiratory organs, etc.

55. Answer: a

Explanation:

The pattern followed here is:

$$343 + 40 = 383$$

$$383 + 60 = 443$$

$$443 + 40 = 483$$

$$483 + 60 = 543$$

Hence, '543' is the correct answer

56. Answer: c

Explanation:

The statement says that Leela is considering recommending the movie to her friends.

Therefore, we can conclude that Leela liked the movie and wants her friends to watch it.

Hence, both the conclusions follow.

57. Answer: b

Explanation:

The logic is:

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

Word	G	A	T	E
Code	7	1	20	5

Similarly,

Word	D	O	O	R
Code	4	15	15	18

Hence, '4151518' is the correct answer.

58. Answer: d

Explanation:

Argument I highlights one of the disadvantages of using smart phones.

It says that one tends to spend more time on smart phones after a point of time and ignore personal time.

On the other hand, argument II states that the additional features offered by smart phones are necessary.

Hence, both the arguments are strong.

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59. Answer: c

Explanation:

The Correct Answer is Option 3 i.e C₂H₅OH.

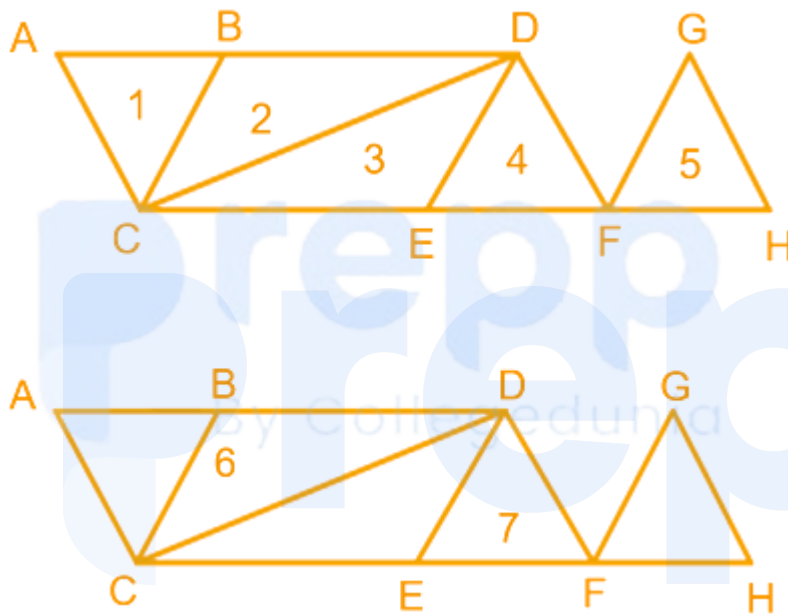
- **Ethanol:**
 - It is also known as ethyl alcohol.
 - It is a colorless, volatile, and flammable liquid that is soluble in water.
 - It is most commonly found in alcoholic beverages.
 - It is also used as an antiseptic and as a disinfectant.
 - Its molecular formula is C₂H₅OH.

60. Answer: d

Explanation:

The triangles in the figure are shown below:

ABC, BCD, CDE, EDF, GFH, ACD and CDF



Hence, '7' is the correct answer.

61. Answer: b

Explanation:

The Venn diagrams that correctly represents the relationship between:

- A) Walking
- B) Swimming
- C) Exercise

Is shown below:



Both walking and swimming are exercises.

Hence, 'option 2' is the correct answer.

62. Answer: b

Explanation:

Two inlet pipes A and B can fill an empty cistern in 22 and 33 hours respectively.

Suppose capacity of the tank = 66 units (LCM of 22 and 33)

Hence,

Efficiency of pipe A = $66/22 = 3$ units

Efficiency of pipe B = $66/33 = 2$ units

They start work together but pipe A had to be closed 5.5 hours before the cistern was full.

Suppose the tank got full in x hours;

So,

$$3 \times (x - 5.5) + 2 \times x = 66$$

$$\Rightarrow 3x - 16.5 + 2x = 66$$

$$\Rightarrow 5x = 82.5$$

$$\Rightarrow x = 16.5$$

Hence, it takes 16.5 hours to fill the cistern by the two pipes.

63. Answer: b

Explanation:

Given:



Let us observe the pattern of the figure.

We can observe that the half circle is moving 90° anticlockwise on alternate steps while the upper circle does not move at all.

Thus, figure C and D will be eliminated as they did not follow the anticlockwise rotation rule.

Figure B will be eliminated as it does not follow the 90° rule.

Figure 'A' fulfills the above condition.

Hence, 'Figure A' is the correct answer.

64. Answer: d

Explanation:

The Correct Answer is Option 4 i.e. Meghalaya.

Meghalaya is not the neighbouring state of West Bengal.

State	Boundaries	Chief Minister	Capital
Sikkim	West Bengal, Bhutan, Nepal, China.	Prem Singh Tamang	Gangtok
Odisha	Jharkhand, West Bengal, Andhra Pradesh, Telangana, and Chhattisgarh	Naveen Patnaik	Bhubaneswar
Jharkhand	Bihar, West Bengal, Odisha, Chhattisgarh, and Uttar Pradesh.	Hemant Soren	Ranchi.
West Bengal	Jharkhand, Bihar, Bangladesh, Odisha , Assam, Sikkim, Bhutan and Nepal.	Mamata Banerjee	Kolkata
<u>Meghalaya</u>	Assam and Bangladesh	Conrad Sangma	Shillong

65. Answer: b

Explanation:

The Correct Answer is Option 2 i.e Coordination of muscular movement.

- **Cerebrum :**
 - This is the most developed part of the brain.

- It is the largest part of the brain.
 - Functions of the cerebrum include thinking, memory, knowledge, etc.
 - **Cerebellum :**
 - Functions of cerebellum include coordination of muscular body movements and maintenance of posture.
 - The cerebellum is known as the little brain.
-

66. Answer: a

Explanation:

The Correct Answer is Option 1 i.e Uttam Singh.

- Lata Mangeshkar Award for Lifetime Achievement is given by the Maharashtra government for the contributions in the field of music.
 - The Maharashtra government instituted this award in the year 1992 in the honour of Bharat Ratna Lata Mangeshkar.
 - Noted music director and violinist Uttam Singh has won the **2016 Lata Mangeshkar Award for Lifetime Achievement**.
 - Uttam Singh is a well-known Indian violinist and music director.
 - **Arijit Singh:**
 - He is an Indian playback singer.
 - He received the 2018 and 2019 IIFA Award for Best Male Playback Singer.
 - He also received the Stardust Award for Best Playback Singer Male 2016.
 - **Bappi Lahiri:**
 - He is often known as the "Disco King" in India.
 - He was an Indian singer, disco musician, and record producer.
 - He received the Filmfare Lifetime Achievement Award 2018.
-

67. Answer: d

Explanation:

CONCEPT:

- **Momentum:** The product of mass and velocity of the body is called momentum.
 - It is a **vector quantity**. It is denoted by P.
 - Its SI unit is kg ms^{-1}

$$\text{Momentum (P)} = \text{mass (m)} \times \text{velocity (v)}$$

CALCULATION:

Given that:

$$\text{Mass (m)} = 10 \text{ kg}$$

$$\text{Velocity (v)} = 2 \text{ ms}^{-1}$$

$$\text{So momentum (P)} = m v = 10 \times 2 = 20 \text{ kgms}^{-1}.$$

68. Answer: b

Explanation:

The Correct Answer is Option 2. i.e European.

- Arab traders shipped Indian goods to European countries through the Red Sea and the Mediterranean ports.
- Trade was also conducted through overland routes with Afghanistan, Central Asia, and Persia.
- **Australia :**
 - Canberra is the capital of Australia.
 - Scott Morrison is the PM of Australia.
 - Great Victoria Desert is located in Australia.
- **Africa :**
 - Africa is the world's second-largest continent and second-most-populous continent, after Asia.

- The continent is bounded by the Atlantic Ocean, the Mediterranean Sea, the Red Sea, and the Indian Ocean.
- **America :**
 - The American comprises the continents of North and South America.
 - Joe Biden is the current president of America.
 - The continent is bounded by the Pacific Ocean, the Atlantic Ocean, the Arctic Ocean, and the Antarctic Ocean.

69. **Answer: a**

Explanation:

All options except 'towel' are used to hold things in place.

Term	Explanation
Clip	flexible or spring-loaded device for holding an object or objects together or in place.
Pin	a thin piece of metal with a sharp point at one end and a round head at the other, used for fastening pieces of cloth, paper, etc
Band	a flat, thin strip or loop of material, used as a fastener or for reinforcement
Towel	a piece of thick absorbent cloth or paper used for drying oneself or wiping things dry.

Hence, 'Towel' is the odd one out.

70. Answer: d

Explanation:

An object travels 25 m in 4 s and then another 15 m in 2 s.

Total distance = $25 + 15 = 40$ m

Total time = $4 + 2 = 6$ sec

Hence,

Average speed = Total distance/Total time = $40/6 = 6.67$ m/s or 6.67 ms^{-1}

71. Answer: d

Explanation:

Let Raghav's present age be x .

Raghav's age after 11 years = $x + 11$

Raghav's age 5 years back = $x - 5$

Applying the condition,

$$x + 11 = 5(x - 5)$$

$$x + 11 = 5x - 25$$

$$5x - x = 25 + 11$$

$$4x = 36$$

$$x = 9$$

Thus, Raghav's present age is 9 years.

Hence, '9 years' is the correct answer.

72. Answer: d

Explanation:

The mirror image for the following figure when the mirror is kept horizontally is shown below:



Hence, figure 'C' is the correct answer.

73. Answer: a

Explanation:

The Correct Answer is Option 1 i.e Dobereiner's law of triads.

- **Dobereiner's law of triads** states that when elements are arranged in the order of increasing atomic masses, the atomic mass of the middle element of the triad is approximately the average of the atomic masses of the other two elements.
 - For example in the triad of lithium, sodium, and potassium, the atomic mass of lithium is 7 and the atomic mass of potassium is 39.
 - The average of masses of lithium and potassium gives the atomic mass of sodium 23.
- **Newland's law of octaves:**
 - It states that when elements are arranged in order to increasing atomic masses, every eighth element has properties similar to the first.
- **Mendeleev's law:**
 - The law states that the physical and chemical properties of the elements are the periodic function of their atomic masses.

- **Newton's law:**

- Newton's first law states that every object will remain at rest or in uniform motion in a straight line unless an external force acts on it.
- Newton's second law states that the rate of change in the momentum of a body is directly proportional to the applied force on the body.
- Newton's third law states that for every action there is an equal and opposite reaction.

74. Answer: b

Explanation:

$$a : b = \frac{3}{2} : \frac{7}{3}$$

Multiplying both terms by 6, we get

$$\Rightarrow a : b = 9 : 14$$

And

$$b : c = \frac{1}{5} : \frac{1}{7}$$

Multiplying both terms by 35, we get

$$\Rightarrow b : c = 7 : 5 \text{ or } 14 : 10$$

Hence,

$$a : b : c = 9 : 14 : 10$$

75. Answer: d

Explanation:

The triangle shaped figure flips 90° anticlockwise in each step and also moves clockwise to the next block in each step.

Therefore, Figure A, B and D are eliminated

Hence, figure C is the correct answer.

76. Answer: a

Explanation:

The Correct Answer is Option 1 i.e Is a member of Rajya sabha.

- **Non-confidence motion :**

- It has been mentioned under Rule 198 of the Rules of Procedure and conduct of Lok Sabha.
 - **The motion of No-confidence can be moved only in Lok Sabha.**
 - **Rajya Sabha does not have the power to move such motion.**
 - It is moved against the entire Council of Ministers and not on individual ministers or private members.
 - The motion has to be passed by a simple majority.
 - When a no-confidence motion has been passed in the house then the Union council of ministers needs to resign and the union government collapses.
 - The Prime Minister of India cannot participate in voting on a non-confidence motion against her/his government if she/he is a member of Rajya Sabha.
-

77. Answer: d

Explanation:

The Correct Answer is Option 4 i.e NITI Aayog.

- **Niti Aayog:**

- It is a policy think tank of the Government of India.
- It is neither a constitutional body nor a statutory body

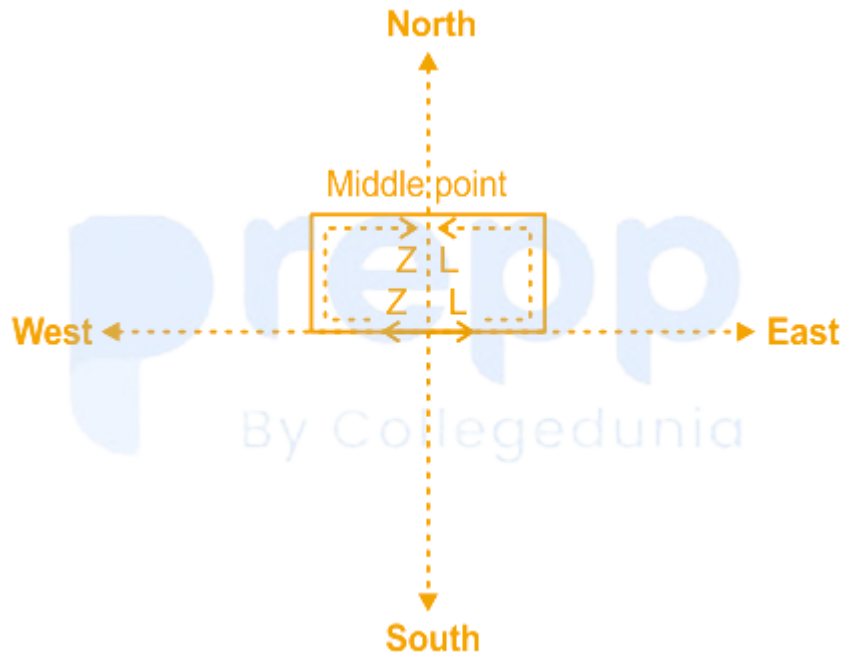
- The Chairperson is the Prime Minister of India.
- Amitabh Kant is the present CEO of Niti Aayog.
- **NITI Aayog has launched Move Hack, a global mobility hackathon to crowdsource solutions aimed at the future of mobility in India.**
- MoveHack aims to bring about innovative, dynamic, and scalable solutions to problems pertaining to mobility.
- **Startup India:**
 - It is an initiative taken by the government of India to promote and encourage the entrepreneurial spirit amongst its citizens.
 - It was launched on 16th January 2016.
- **Standup India:**
 - The Standup India scheme was launched on 5th April 2016:
 - It was launched to promote entrepreneurship among Scheduled Caste/Schedule Tribe and Women for loans in the range of Rs 10 Lakhs to Rs 100 Lakhs.
- **Startup Village Entrepreneurship Programme:**
 - The scheme was launched in the year 2018.
 - It is a sub-scheme of Deendayal Antyodaya Yojana – National Rural Livelihoods Mission (DAY-NRLM).
 - It has been launched to stimulate economic growth and reduce poverty and unemployment in villages by creating self-sustainable self-employment opportunities for youths located in selected villages.

78. Answer: b

Explanation:

Z and L travel in opposite directions (East-West)

To meet again, they must travel the opposite of their original directions.



Thus, the person who is traveling east must travel west. And the person who was traveling west must travel east.

So, both the person are meet at the middle point facing East and West.

Hence, 'East-West' is the correct answer.

79. Answer: a

Explanation:

The Correct Answer is Option 1 i.e Shahid Kapoor.

- The 18th edition of the International Indian Film Academy Awards was held in New York in 2017.
- Shahid Kapoor:
 - He is an Indian bollywood actor.
 - He been awarded with Best Actor (Male) award for Uda Punjab at the 18th IIFA Awards held in 2017.
 - He also received the 2015 Filmfare Award for Best Actor for the film Haider.
- Arjun Kapoor:
 - He is an Indian bollywood actor.

- He received the Zee Cine Award Best Male Debut for the year 2013.
- He received the Superstar of Tomorrow (Male) of Stardust Award for Ishaqzaad In the year 2013.
- **Aamir Khan:**
 - He received the Deenanath Mangeshkar Award 2017 for Dangal movie.
 - He received Padma Shri in the year 2003.
 - He also received Padma Bhushan in the year 2010.
 - He received the 2002 IIFA Award for Best Actor for the film Lagaan.
- **Salman Khan;**
 - He received the IIFA Habitat Humanity Ambassadorship Award in the year 2010.
 - He also won the Airtel Superstar Hero Award 2011 for the film Bodyguard.

80. Answer: d

Explanation:

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

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

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

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

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

$$\{(99 - 1)/7^2\} \times 2 + 8 = ?$$

$$\Rightarrow ? = \{98/49\} \times 2 + 8$$

$$\Rightarrow ? = 2 \times 2 + 8$$

$$\Rightarrow ? = 4 + 8 = 12$$

81. Answer: d

Explanation:

The Correct Answer is Option 4 i.e

- **Azim Premji:**
 - Azim Premji has been honoured with the 2017 Carnegie Medal of Philanthropy for his efforts to reform India's public school system.
 - He is the chairman of Wipro Limited.
 - He is an Indian engineer, investor and philanthropist.
 - He is informally known as the Czar of the Indian IT Industry.
 - He was awarded with Padma Vibhushan in the year 2011.
- **Ness Wadia:**
 - He is an Indian businessman.
 - He is the co-owner of the Indian Premier League cricket team Kings XI Punjab.
- **Ratan Tata:**
 - He is an Indian businessman, philanthropist, and a former chairman of Tata Sons.
 - He received the Padma Vibhushan in the year 2008.
 - He also received the Padma Bhushan in the year 2000.
- **Anil Ambani:**
 - Anil Ambani is the Chairman of Reliance Group.
 - He was conferred with the 'Entrepreneur of the Decade Award' by the Bombay Management Association, 2002.

82. Answer: d

Explanation:

The Correct Answer is Option 4 i.e Aluminium.

- Sound waves are longitudinal waves.
- The speed of sound is different in different mediums.
- The speed of sound is maximum in solids and minimum in gases.
- In a medium, the speed of sound basically depends upon the elasticity and density of the medium.
- The speed of sound is independent of frequency.
- The speed of sound is independent of pressure.
- The speed of sound increases with the increase of temperature of the medium.
- When sound enters from one medium to another medium, its speed and wavelength changes but the frequency remains unchanged.

Medium	Speed of sound (m/s)
Normal Air	343
Water	1433
Steel (stainless)	5970
Iron	5130
Nickel	6040
<u>Aluminium</u>	6420

83. Answer: a

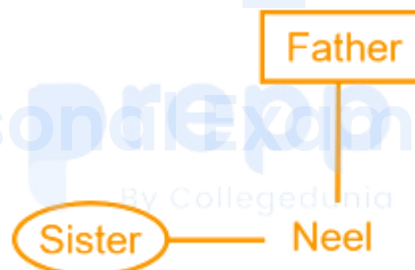
Explanation:

The family tree diagram is shown below:

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

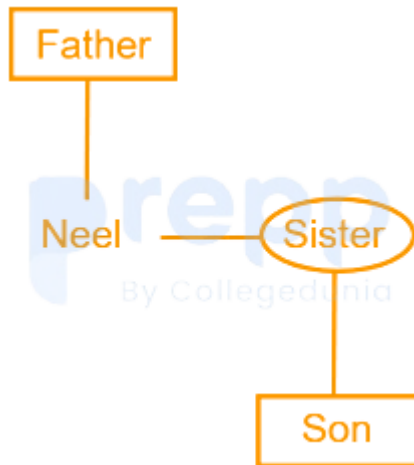
Given: Pointing to a photograph, Neel says he is the son of the only daughter of the father of my sister.

1. Father of Neel's sister is the father of Neel.



2. Son of the only daughter implies that the person in the photograph is the son of Neel's sister.

Hence, Neel is pointing at his 'Nephew'.



Hence, 'Nephew' is the correct answer.

84. Answer: d

Explanation:

The statement does not talk or suggest anything about the newspaper in general.

Therefore, assumption II is not implicit.

The meaning of the title is that our sufferings are a product of our thoughts.

Thus, it can be safely assumed that our actions depend on our thoughts.

Hence, only assumption I is implicit.

85. Answer: a

Explanation:

CONCEPT:

- **Thrust:** The force acting perpendicular to the surface of the object is called thrust.

- It is a type of force so the SI unit of thrust is Newton (N).
- The effect of thrust is **more on the smaller surface area** than the **thrust acting on a larger surface area**.

EXPLANATION:

- The effect of thrust depends on the area of the surface on which it acts. So option 1 is correct.



- The normal force exerted by liquid at rest on a given surface in contact with it is called the thrust of liquid on that surface.
- The normal force (or thrust) exerted by liquid at rest per unit area of the surface in contact with it, is called pressure of liquid or hydrostatic pressure.

86. Answer: d

Explanation:

All the numbers between 5^2 and 6^2 will be non-perfect square numbers as 5 & 6 are consecutive numbers.

Numbers between $5^2 (= 25)$ and $6^2 (= 36)$ are 26, 27, 28, 29, 30, 31, 32, 33, 34, 35.

$\therefore$ Total numbers = 10

87. Answer: c

Explanation:

Given:

Pass mark = 40%

The student gets 40 marks and failed by 40 numbers

Calculation:

Suppose the maximum marks = x

A student has to secure 40% marks to pass i.e. ' $0.4x$ ' marks.

He obtains 40 marks and fails by 40 marks.

So,

$$40 + 40 = 0.4x$$

$$\Rightarrow 0.4x = 80$$

$$\Rightarrow x = 80 \times (10/4) = 200$$

$\therefore$ The maximum obtainable marks are 200.

★ **Shortcut Trick**

The student get 40 marks and failed by 40 marks

$$\Rightarrow \text{Passing mark} = (40 + 40) = 80$$

Accordingly,

$$40\% \rightarrow 80$$

$$\Rightarrow 100\% \rightarrow (80/40) \times 100 = 200$$

$\therefore$ The maximum obtainable marks are 200.

88. Answer: a

Explanation:

Pipe A can fill an empty cistern in 6.8 hours and pipe B can fill it up in 10.2 hours.

Suppose the capacity of cistern = 20.4 units (LCM of 6.8 and 10.2)

Hence,

Efficiency of pipe A = $20.4/6.8 = 3$ units

Efficiency of pipe B = $20.4/10.2 = 2$ units

Given: Only Pipe B is turned on for 1.7 hours after which Pipe A is also turned on.

Suppose the cistern got filled in 'a' hours;

So, Pipe B was operated for complete 'a' hours while pipe A was operated for (a – 1.7) hours;

$$(a - 1.7) \times 3 + a \times 2 = 20.4$$

$$\Rightarrow 3a - 5.1 + 2a = 20.4$$

$$\Rightarrow 5a = 25.5$$

$$\Rightarrow a = 5.1 \text{ hours or 5 hours 6 minutes}$$

Hence, time to fill up the cistern = 5 hours 6 minutes

89. **Answer: c**

Explanation:

The family tree diagram is shown below:

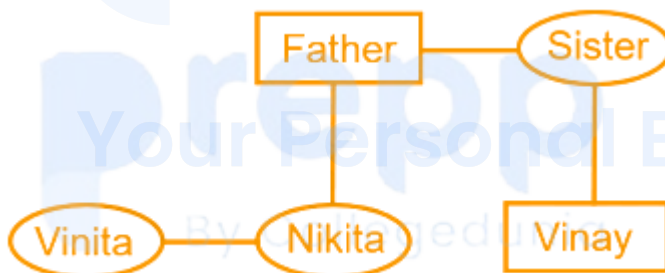
Symbol in Diagram	Meaning
○	Female
□	Male
==	Married couple
—	Siblings
	Difference of a generation

1. Vinita and Nikita are sisters.



2. Vinay is the son of Nikita's father's sister.

The final arrangement will be:



Hence, Vinay is a 'cousin' of Nikita.

Hence, 'cousin' is the correct answer.

90. Answer: a

Explanation:

Total distance covered by train = length of train + length of bridge

$$= 153 + 747 = 900 \text{ m}$$

Time = 40.5 seconds

So,

$$\text{Speed of train} = 900/40.5 \text{ m/sec}$$

$$\text{Converting m/sec into km/hr} \Rightarrow (900/40.5) \times (18/5) = 180/2.25 = 80 \text{ km/hr}$$

91. Answer: a

Explanation:

The logic is:

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

Word	J	A	I	L
Code (Only unit digit is considered)	$10 - 1 = 9$	$1 - 1 = 0$	$9 - 1 = 8$	$12 - 1 = (1)1$

Similarly,

Word	P	R	I	S	O	N
Code (Only unit digit is considered)	$16 - 1 =$ (1)5	$18 - 1 =$ (1)7	$9 - 1 =$ 8	$19 - 1 =$ (1)8	$15 - 1 =$ (1)4	$14 - 1 =$ (1)3

Hence, '578843' is the correct answer.

92. Answer: c

Explanation:

Let us observe the pattern of figures A and C.

The smaller end of the figure will always be in touch with the folded line as is in the original figure. This condition is not followed by figures A and C. Thus, they will be eliminated.

Let us observe the pattern of figure D.

Only one end of the figure will always remain in touch with the folded line as is in the original figure. Thus, figure D will be eliminated.

Hence, 'figure B' is the correct answer

93. Answer: b

Explanation:

Given: $\angle BCD = 82^\circ$

From the **Alternate segment theorem**:

In any circle, the angle between a chord and a tangent through one of the end points of the chord is equal to the angle in the alternate segment.

Hence, $\angle BAC = \angle BCD = 82^\circ$

94. Answer: a

Explanation:

CONCEPT:

- Equation of motion: The mathematical equations used to find the final velocity, displacements, time, etc of a moving object without considering force acting on it are called equations of motion.
- These equations are only valid when the acceleration of the body is constant and they move on a straight line.

There are three equations of motion:

$$V = u + at$$

$$V^2 = u^2 + 2as$$

$$S = ut + \frac{1}{2}at^2$$

Where, V = final velocity, u = initial velocity, s = distance traveled by the body under motion, a = acceleration of body under motion, and t = time taken by the body under motion.

EXPLANATION:

Here acceleration is acceleration due to gravity ($a = g = 10 \text{ m/s}^2$).

Time of ascent (t) = Time of descent (t) = $12.5/2 = 6.25 \text{ s}$

Final velocity (v) = 0 (at maximum height) , Initial velocity (u) = ?

Using $v = u + at$,

we get

$$\Rightarrow 0 = u + (-10 \times 6.25)$$

$$\Rightarrow -u = -10 \times 6.25$$

$$\Rightarrow u = 62.5 \text{ ms}^{-1}$$

- The Velocity with which it was thrown up is 62.5 ms^{-1} . So option 1 is correct.

95. Answer: b

Explanation:

$$\frac{0.16 \times 1.65}{0.075 \times 0.02^2} = ?$$

$$\Rightarrow ? = \frac{0.16 \times 1.65}{0.075 \times 0.0004}$$

$$\Rightarrow ? = \frac{0.264}{0.00003}$$

$$\Rightarrow ? = 8800$$

96. Answer: b

Explanation:

The Correct Answer is Option 2. i.e. Cellulose and pectin.

- Chitin :
 - Chitin is a large, structural polysaccharide, and is a derivative of glucose.
 - It is a hard substance found in exoskeletons of arthropods and also in cell walls of certain fungi and algae.
- Plant cell wall :
 - The plant cell wall is made up of cellulose and pectin.
 - It provides a structural framework to support the growth of plants.
 - The cell wall also acts as the first line of defense against pathogens.

- **Pectin :**
 - It is a polysaccharide material that is found in fiber within the cell walls of most plants.
 - It also contributes to the cell structure of plants.
- **Murein :**
 - It is a polymer that makes up the cell wall of most bacteria.
 - It is made of chains of alternating molecules called N-acetylglucosamine (NAG) and N-acetylmuramic acid (NAM).

97. Answer: b

Explanation:

The information in the statement is insufficient to determine the profession of Ranjan.

Therefore, conclusion I does not follow.

The statement does not give any information about the likes or dislikes of Lata.

Therefore, conclusion II does not follow.

Hence, "neither I nor II follows" is the correct answer.

98. Answer: b

Explanation:

CONCEPT:

- **Momentum :** momentum is the **product of** the **mass** and **velocity** of an object. It is a **vector quantity** , possessing a **magnitude** and a **direction** .
 - The unit of momentum (P) is **kg m/s** .
 - Dimension: $[MLT^{-1}]$

⇒ Momentum (P) = M V

Where M = mass, V = velocity.

- **Kinetic energy** : It is the **energy** of the body **associates** with its **motion** .
 - The unit of kinetic energy (K) is kg m s^{-2} .
 - Dimension: $[\text{ML}^2\text{T}^{-2}]$

⇒ $K = \frac{1}{2} m v^2$

where K is kinetic energy, m is mass; v is the velocity of the body.

CALCULATION:

Given Mass (M) = 200gm = 0.2 kg.

⇒ Kinetic energy = 10 J

⇒ $(1/2)MV^2 = 10 \text{ J}$

⇒ $(1/2) \times 0.2 \times V^2 = 10$

⇒ $V^2 = (10 \times 2)/0.2$

⇒ $V^2 = 100$

⇒ $V = 10 \text{ ms}^{-1}$

Momentum = M V

= 0.2×10

Momentum = 2 kg m/s.

The Correct Answer is Option 2 i.e 2 kg m/s .

99. Answer: d

Explanation:

Diameter of the wheel = $2r = 63 \text{ cm}$

So, circumference of the wheel = $2\pi r = 63\pi \text{ cm} = 63 \times 22/7 = 198 \text{ cm}$

so distance covered in one rotation = circumference of the wheel = 198 cm

Distance = $99 \text{ km} = 99 \times 10^5 \text{ cm}$

Hence,

Number of revolutions

$$= (99 \times 10^5)/198$$

$$= 10^5/2$$

$$= 100000/2$$

$$= 50000$$

100. Answer: a

Explanation:

Given:

Speed of X = 3 km/hr

Speed of Y = 4 km/hr

So,

Time in which Y will reach Q from P = $21/4 \text{ hr}$

Distance covered by X in $21/4 \text{ hrs} = 3 \times 21/4 = 63/4 \text{ km}$

$\therefore$ Distance between X and Y = $21 - 63/4 = 21/4 \text{ km}$

Now when Y reached Q and started towards P, relative speed of X and Y = $4 + 3 = 7 \text{ km/hr}$

$\therefore$ Time in which $21/4$ km will be by both (After which they will meet) = $(21/4)/7 = 3/4$ hours

Distance of R from Q = Distance travelled by Y in $3/4$ hours = $3/4 \times 4 = 3$ km

So,

Distance of R from P = $21 - 3 = 18$ km

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