Prepp

Your Personal Exams Guide

- NDA
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- SSC CGL
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RRB NTPC 2021 (CBT 1) Previous Year Paper (16 Jan 2021) 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	Test	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.

Test

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

   Assam : Tezpur :: Kerala : ?

   a. Jeypore

   b. Midnapore

   c. Thenzawl

   d. Kochi

---

2. A train covers a certain distance at a speed of 240 km/h in 5 hours. If a flight has to cover the same distance in 45 mins, it must travel at a speed of: **(+1, -0.33)**

   a. 1600 km/h

   b. 1200 km/h

   c. 1440 km/h

   d. 1250 km/h

---

3. The area of a square field is 7200 m^2. How long will a cycle take to cross the field diagonally at a constant rate of 4 km/h? **(+1, -0.33)**

   a. 5 minutes

   b. $\frac{9}{5}$ minutes

   c. 30 minutes

d. 25 minutes

---

4. The sum of the interior angles of a polygon measure 3240°. How many sides does the polygon have? **(+1, -0.33)**

a. 10

b. 15

c. 20

d. 5

---

5. The value of x, if 3x + 4 × 8 ÷ 9 = x ÷ 3 − 1, is: **(+1, -0.33)**

a. $-\frac{41}{24}$

b. $\frac{21}{24}$

c. 2

d. 1

---

6. ISRO launched India's first lunar probe mission in October 2008. Who was the Chairman of ISRO at that time? **(+1, -0.33)**

a. APJ Abdul Kalam

b. A S Kiran Kumar

c. G Madhavan Nair

d. K Kasturirangan

---

7. The value of 180 ÷ 20 {(15 – 6) + (24 – 18)} is: **(+1, -0.33)**

a. 110

b. 135

c. $\frac{9}{15}$

d. 180

---

8. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusion(s) is logically TRUE. **(+1, -0.33)**

Statements:

A. All boys are intelligent.

B. All boys are smart.

Conclusion:

1. Some boys are smart and intelligent.

2. All intelligent are smart.

a. Neither conclusion 1 nor 2 is true.

b. Only conclusion 2 is true.

c. Both conclusions 1 and 2 are true.

d. Only conclusion 1 is true.

---

9. If $x^2 + 1 = 2x$, then find $x - \left(\frac{1}{x}\right)$ **(+1, -0.33)**

a. 4

b. 12

c. 0

d. 2

---

10. The value of $[3 \div 5 - 8 \text{ of } 4 + 3 \times \{8 \div 2 - (4 + 3)\}]$ is: **(+1, -0.33)**

a. $-\frac{202}{10}$

b. $\frac{101}{5}$

c. $\frac{201}{5}$

d. $-\frac{202}{5}$

---

11. What will be smallest number, which on adding 25 to it, is exactly divisible by 25, 36 and 40? **(+1, -0.33)**

a. 3725

b. 1775

c. 2225

d. 25

---

12. Who among the following got elected as the Head of the State for four times? **(+1, -0.33)**

a. Viktor Zubkov

b. Boris Yeltsin

c. Vladimir Putin

d. Dmitry Medvedev

---

13. Factors that make a person's place of origin seem less attractive for reasons such as unemployment, poor living conditions and unpleasant climate are called _ _ _ _ _ _ _ _ _ factors. **(+1, -0.33)**

a. climatic

b. push

c. pull

d. negative

---

14. E and C mutually like to work with each other. A likes to work with C and H. H and L do not like to work with anyone. Who is isolated in the office? **(+1, -0.33)**

a. L

b. A

c. Both H and L

d. H

---

15. _ _ _ _ _ _ _ _ _ is **NOT** an example of an insulator. **(+1, -0.33)**

a. Human body

b. Diamond

c. Rubber

d. Glass

---

16. A person crosses a 500 m long street in 10 minutes. What will the person's speed be in kilometres per hour? **(+1, -0.33)**

a. 8 km/h

b. 3 km/h

c. 5 km/h

d. 7 km/h

---

17. Read the given statement and conclusions carefully. Assuming that the information given in the statement is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements. **(+1, -0.33)**

Statement:

Driving on wrong side has become a common practice these days,

Conclusions:

I. Drivers do not know which side they are supposed to drive.

II. Chances of accidents increase.

a. Only II follows

b. Either I or II follows

c. Only I follows

d. Neither I nor II follows.

---

18. The value of $\sqrt{\frac{1+cos\ 2A}{1-cos\ 2A}}$ = ? (Note: A is non zero) **(+1, -0.33)**

a. cos A

b. cot A

c. tan A

d. sin A

---

19. The internet works by using a protocol called TCP/IP. What is the full form of TCP/IP? **(+1, -0.33)**

a. Transmission Computer Programme/Internet Protocol

b. Transmission Control Protocol/Internet Protocol

c. Temporary Computer Protocol/Internet Protocol

d. Tele Computer Protocol/Internet Protocol

---

20. The cost price of 120 pens is the same as the selling price of x pens. If the profit is 25%, then the value of x is **(+1, -0.33)**

a. 96

b. 95

c. 91

d. 90

21. If x cos 45° sin 120° + sin 60 ° = –x sin 90° + 1, then the value of x is: **(+1, -0.33)**

a. $\frac{(2-\sqrt{3})}{(\sqrt{2}+\sqrt{3})}$

b. $\frac{2\sqrt{2}-\sqrt{6}}{2\sqrt{2}+\sqrt{3}}$

c. $\frac{(2+\sqrt{3})}{(\sqrt{2}+\sqrt{3})}$

d. $\frac{(2-\sqrt{3})}{(2\sqrt{2}+\sqrt{3})}$

---

22. Kidney failure is treated periodically on a kidney machine. The process is known as _ _ _ _ _ _ _ _. **(+1, -0.33)**

a. Excretion

b. Metabolism

c. Hemodialysis

d. Circulation

---

23. As of 31 st October 2020, the United Nation comprises _ _ _ _ _ _ _ _ member states. **(+1, -0.33)**

a. 193

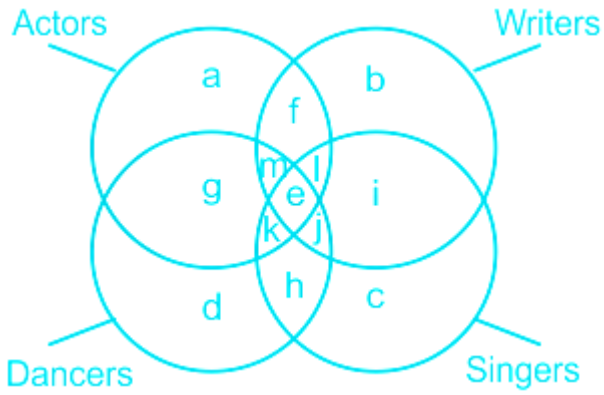
b. 250

c. 150

d. 100

---

24. Study the following Venn diagram and find the region representing persons who are writers, singers and dancers, but not actors. **(+1, -0.33)**



a. k

b. e

c. j

d. f

---

25. Select the letter-cluster from among the given options that can replace the question mark (?) in the following series. **(+1, -0.33)**

CX, FU, IR, (?)

a. HS

b. JQ

c. LO

d. KP

---

26. Ashoka spends 10% of his monthly income and saves Rs 5,400 every month. What is his monthly income? **(+1, -0.33)**

a. Rs. 6,400

b. Rs. 6,000

c. Rs. 5,400

d. Rs. 5,000

---

27. In which year was the 'National Human Rights Commission' established in India? **(+1, -0.33)**

a. 1950

b. 1993

c. 1857

d. 1947

---

28. Which was the first vehicle to soft-land safely on the surface of the Moon? **(+1, -0.33)**

a. Apollo 17

b. Sputnik 25

c. Luna 9

d. Ranger 6

---

29. Which of the following films was **NOT** nominated for an Oscar award? **(+1, -0.33)**

a. Lagaan

b. Karma

c. Mother India

d. Salaam Bombay

---

30. What will be the LCM of 48 and 65? **(+1, -0.33)**

a. 48

b. 1

c. 3120

d. 65

---

31. Which of the following sites is NOT a part of the Indus Valley Civilization? **(+1, -0.33)**

a. Harappa

b. Uruk

c. Mohenjo Daro

d. Lothal

---

32. If a cot θ = b, then the value of $\frac{a\cos\theta - b\sin\theta}{a\cos\theta + b\sin\theta}$ = ? **(+1, -0.33)**

a. a – b

b. 2a

c. 0

d. a + b

---

33. Which of the following statements is NOT TRUE about fishes? (+1, -0.33)

a. Fishes have only two chambers to their hearts.

b. Blood goes only once in one cycle through the heart of a fish.

c. Fishes have double circulation.

d. Blood is pumped through the fishes' gills and gets oxygenated.

---

34. _ _ _ _ _ _ _ _ _ was the first bank that was established in India in 1770. (+1, -0.33)

a. Bank of Baroda

b. State Bank of India

c. Indian Bank

d. Bank of Hindustan

---

35. The value of 8 + $(\frac{1}{2} + \frac{1}{4})$ × 16 is: (+1, -0.33)

a. 10

b. 4

c. 35

d. 20

---

36. If PI = Y and SD = W, then find GN = ? (+1, -0.33)

a. X

b. Z

c. U

d. V

---

37. Who among following is NOT related with Indian Space Program? **(+1, -0.33)**

a. AS Kiran Kumar

b. Satish Dhawan

c. K Sivan

d. Satyendra Nath Bose

---

38. Who among the following was appointed as UNICEF's global Goodwill Ambassador in 2018? **(+1, -0.33)**

a. Lilly Singh

b. Millie Bobby Brown

c. Novak Djokovic

d. Priyanka Chopra

---

39. Seven friends are sitting in an arch shape facing inwards. R and V are sitting on the corner sides. T says that, “On my right-hand side more than two persons are sitting and R is the last one". Q says that, "On my left-hand side there are three persons sitting in which V is the last one". S and V are sitting beside each other. How many persons are sitting to the left and right side of T respectively? **(+1, -0.33)**

a. Four and two

b. Three and three

c. One and five

d. Two and four

---

40. If a : b = $\sqrt{7} : \sqrt{3}$, then the value of (3a + 2b) : (3a – 2b) is equal to: **(+1, -0.33)**

a. $\frac{2+\sqrt{21}}{(2-\sqrt{21})}$

b. $\frac{2+\sqrt{21}}{(-2+\sqrt{21})}$

c. $\frac{2-\sqrt{21}}{(2+\sqrt{21})}$

d. $\frac{2+\sqrt{21}}{(-2-\sqrt{21})}$

---

41. If a = $\frac{3}{7}$ b, then the value of $\frac{8a-b}{2a+3b}$ is: **(+1, -0.33)**

a. $\frac{21}{17}$

b. $\frac{17}{27}$

c. 17

d. $\frac{17}{2}$

---

42. If CHARGER is coded as 129 then HINGES will be coded as: **(+1, -0.33)**

a. 101

b. 99

c. 102

d. 100

---

43. A group of workers who are highly qualified, skilled and that do mental work are called: (+1, -0.33)

a. White collar workers

b. Artisans

c. Plumbers

d. Farmers

---

44. Which of the following cities is known as “The Queen of the Arabian Sea'? (+1, -0.33)

a. Visakhapatnam

b. Mumbai

c. Kochi

d. Port Blair

---

45. A domain name is a unique name given to each website on the internet. The last part of the domain name is known as a domain extension. Which of the following is a domain extension of any government website? (+1, -0.33)

a. .com

b. .net

c. .gov

d. .mil

---

46. Name the country that has officially proclaimed 'Gross National Happiness (GNH)' as the measure of its progress. (+1, -0.33)

a. India

b. Sri Lanka

c. Nepal

d. Bhutan

---

47. Vikas buys an old bike for Rs. 30,000 and spends Rs. 5,000 on its repairs. If he sells the bike for Rs. 42,000, his gain percentage is: (+1, -0.33)

a. 18%

b. 19%

c. 20%

d. 17%

---

48. The addition of which of the following adds fizz to soft drinks? (+1, -0.33)

a. Citric acid

b. Carbonic acid

c. Acetic acid

d. Sulphuric acid

---

49. Which one of the following is **NOT** a sub-field of economic geography? **(+1, -0.33)**

a. Political Geography

b. Geography of Agriculture

c. Geography of Tourism

d. Geography of Resources

---

50. If x : y = 2 : 3 then what is the value of (5x + 3y) : (5x – 3y) **(+1, -0.33)**

a. 19 : 3

b. 9 : 1

c. 19 : 2

d. 19 : 1

---

51. Swachh Survekshan is an annual survey of cleanliness, hygiene and sanitation in cities and towns across India. Swachh Survekshan 2020 declared _ _ _ _ _ _ _ _ _ as India's cleanest city. **(+1, -0.33)**

a. Jaipur

b. Mumbai

c. Delhi

d. Indore

---

52. Which of the following Venn diagrams best represents the relationship between Doctors, Engineers and Lawyers. **(+1, -0.33)**

a. 4

b. 1

c. 2

d. 3

---

53. Where is Sri Guru Ram Dass Jee International Airport located? **(+1, -0.33)**

a. Amritsar

b. Bareilly

c. Shimla

d. Chandigarh

---

54. In a certain code language, A is written as 26 and O is written as 12. How will AMAZON be written as in that language? **(+1, -0.33)**

a. 26142611213

b. 26152611213

c. 26132611213

d. 26122611213

---

55. The Vedas are considered the earliest literary record of Indo-Aryan **(+1, -0.33)**

civilisation. There are four Vedas: Rigveda, Samaveda, Yajurveda and the fourth one is _ _ _ _ _ _ _ _ _.

a. Dhanurveda

b. Ayurveda

c. Shilpaveda

d. Atharvaveda

---

56. What will be the LCM and HCF of 27 and 81? **(+1, -0.33)**

a. 81 ; 27

b. 27 ; 81

c. 81 ; 81

d. 27 ; 27

---

57. A vender bought toffees at 10 for a rupee. How many for a rupee must he sell to gain 25% ? **(+1, -0.33)**

a. 6

b. 8

c. 30

d. $\frac{1}{5}$

---

58. In which year was the new currency symbol of the Indian rupee officially adopted? **(+1, -0.33)**

a. 2018

b. 2000

c. 2010

d. 1995

---

59. L and A are classmates as well as good friends. In a class of 30 students, L has 10 unique friends and 5 friends who are common to A. A has a total of 17 friends in the class. How many students are friends with neither L nor A? **(+1, -0.33)**

a. 5

b. 3

c. 4

d. 2

---

60. Name the major revolt inspired by Mahatma Gandhi against the forced cultivation of indigo. **(+1, -0.33)**

a. Munda uprising

b. Champaran Satyagraha

c. Non-Cooperation Movement

d. Dandi March

---

61. Who wrote the book, 'Why I am Hindu'? **(+1, -0.33)**

a. Manmohan Singh

b. Atal Bihari Vajpayee

c. Narendra Modi

d. Shashi Tharoor

---

62. _ _ _ _ _ _ _ _ _ was the first president of Indian National Congress. **(+1, -0.33)**

a. Womesh Chandra Banerjee

b. Annie Besant

c. J B Kriplani

d. Jawaharlal Nehru

---

63. Vikas can complete a job in 15 days. Bablu can do the same job in 10 days. In how many days can they complete the job if they work together? **(+1, -0.33)**

a. 9 Days

b. 8 Days

c. 6 Days

d. 5 Days

---

64. Which infantry battalion was involved in the killing of all its white officers in the Revolt of 1857? **(+1, -0.33)**

a. 21st Native Infantry

b. 41st Native Infantry

c. 20th Native Infantry

d. 1st Native Infantry

---

65. The value of $15 - (6 + 6 \times 6) \div (2 + 5)$ is: **(+1, -0.33)**

a. 8

b. 5

c. 9

d. 7

---

66. If $x + y = 5$ and $xy = 6$, then find $x^3 + y^3$ **(+1, -0.33)**

a. 25

b. 55

c. 45

d. 35

---

67. Who was the first and only acting PM of India? **(+1, -0.33)**

a. HD Deve Gowda

b. VP Singh

c. Gulzarilal Nanda

d. I K Gujral

---

68. Two ships are sailing in the sea on the two sides of a lighthouse. The angles of elevation of the top of the lighthouse as observed from the ships are 45 ° and 60° respectively. If the lighthouse is 81 m high, then the distance between two ships is: (+1, -0.33)

a. $\frac{(1+\sqrt{3})}{81\sqrt{3}}$ m

b. $\frac{[81(1+\sqrt{3})]}{\sqrt{3}}$ m

c. $\frac{81}{\sqrt{3}}$ m

d. $\frac{(1+\sqrt{3})}{\sqrt{3}}$ m

---

69. An observer 2 m tall is 150 $\sqrt{3}$ m away from a tower. The angle of elevation from his eye to the top of the tower is 60°. The height of the tower is: (+1, -0.33)

a. 400 m

b. 450 m

c. 452 m

d. 480 m

---

70. Which of the following is a pigment present in human blood that carries oxygen from our lungs to all parts of the body? (+1, -0.33)

a. Haemoglobin

b. White blood cells

c. Platelets

d. Lymph

---

71. In which year was the Railway introduced by the British in India for passengers? (+1, -0.33)

a. 1853

b. 1583

c. 1385

d. 1953

---

72. Which one of the following is **NOT** a web browser? (+1, -0.33)

a. Opera

b. Wikipedia

c. Google Chrome

d. Mozilla Firefox

---

73. In which year did the East India Company acquire 'Diwani' rights over Bengal and Bihar? (+1, -0.33)

a. 1865

b. 1765

c. 1675

d. 1965

---

74. The perimeter of a rhombus is 68 cm and one of its diagonals is 16 cm. Find (+1, -0.33)

the area of the rhombus.

a. 200 sq cm

b. 220 sq cm

c. 240 sq cm

d. 320 sq cm

---

75. To which country does the famous 'Zulu' tribe belong? **(+1, -0.33)**

a. India

b. Pakistan

c. South Africa

d. China

---

76. The value of $4 \times 5 \div 2 - 8 \times 7 + 9 - (3 + 2)$ is: **(+1, -0.33)**

a. −42

b. 21

c. 70

d. 35

---

77. In a certain code, LOTUS is written as KPSVR. How can WATER be written in that code? **(+1, -0.33)**

a. VBFSQ

b. UBFSQ

c. VBSFQ

d. UQSGB

---

78. If the radius of a cylinder is 5 cm and its vertical height is 172 cm, what will be the volume? (+1, -0.33)

a. 4300 πcm^3

b. 4100 πcm^3

c. 1500 πcm^3

d. 1000 πcm^3

---

79. Which article of the Constitution of India gives the parliament the power to amend the constitution? (+1, -0.33)

a. Article 368

b. Article 356

c. Article 144

d. Article 198

---

80. When was National Rural Health Mission launched? (+1, -0.33)

a. 12th April 2005

b. 15th August 2005

c. 30th December 2003

d. 1st January 2000

---

81. _ _ _ _ _ _ _ _ is India's first multi-petaflop supercomputer that has been set up at Indian Institute of Tropical Meteorology (IITM), Pune. Developed at a cost of Rs. 450 crore, the supercomputer is used for weather and climate predictions. **(+1, -0.33)**

a. Pratyaksh

b. Param

c. Aaditya

d. Pratyush

---

82. _ _ _ _ _ _ _ _ is a Serbian Australian motivational speaker born with tetra-amelia syndrome, a rare disorder characterised by the absence of all four limbs. **(+1, -0.33)**

a. Nick Vujicic

b. Lisa Nichols

c. Dave Ramsay

d. Tony Robbins

---

83. Among the four words listed below, three are alike in some manner and one is different. Select the odd one. **(+1, -0.33)**

a. Fear

b. Happiness

c. Anger

d. Intelligence

---

84. The _ _ _ _ _ _ _ _ gland, which hangs by a thin stalk from the hypothalamus, is called the master gland of the human body. (+1, -0.33)

a. pancreas

b. thyroid

c. adrenal

d. pituitary

---

85. Which of the following Venn diagrams best represents the relationship between the classes: (+1, -0.33)

Banana, Food, and Fruit

a. 4

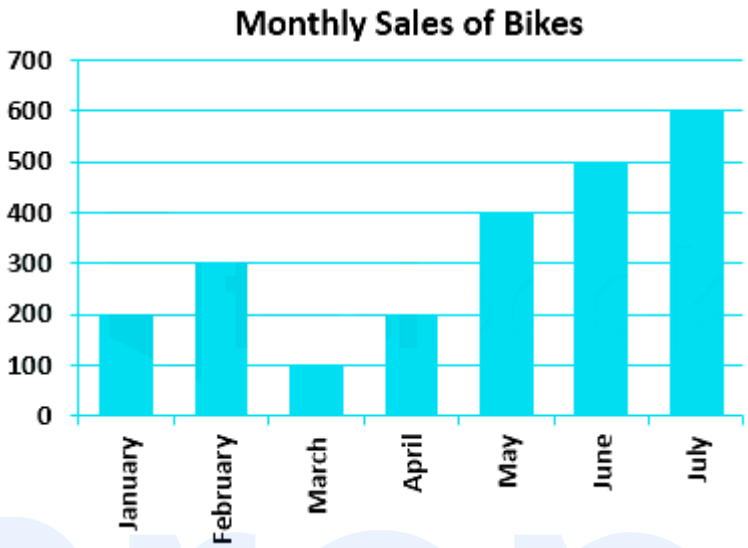
b. 1

c. 2

d. 3

---

86. The graph below represents the number of bikes sold over a period of seven months. Observe the graph and answer the question that follows: (+1, -0.33)



In which of the following months, were the sales nearest to the average sales for the period January to July?

a. May

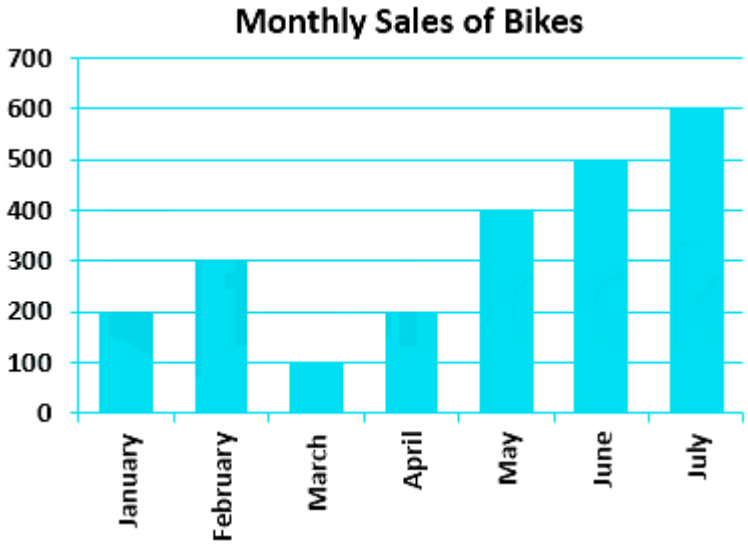
b. January

c. February

d. April

---

87. The graph below represents the number of bikes sold over a period of seven months. Observe the graph and answer the question that follows: (+1, -0.33)



The sales in July was _ _ _ _ _ _ _ _ _ times the sales in January

a. 2

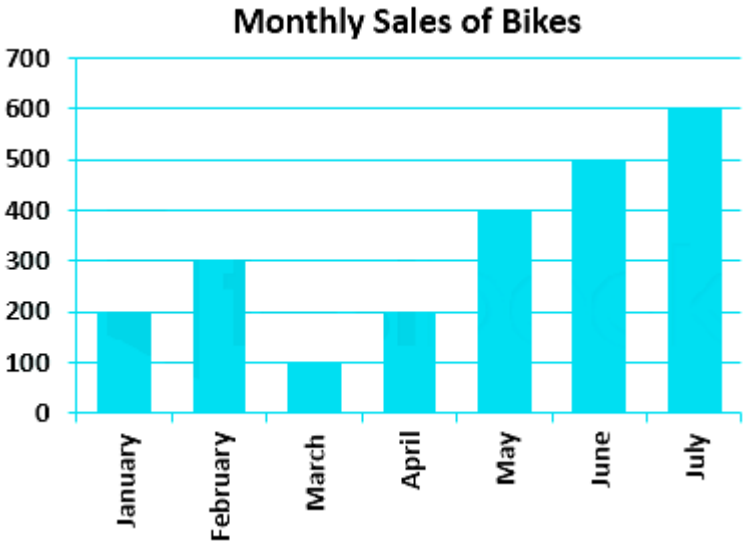
b. 2.5

c. 3.5

d. 3

---

88. The graph below represents the number of bikes sold over a period of seven months. Observe the graph and answer the question that follows: **(+1, -0.33)**



What is the approximate percentage increase in average sales between the period January to March and the period April to June?

a. 83%

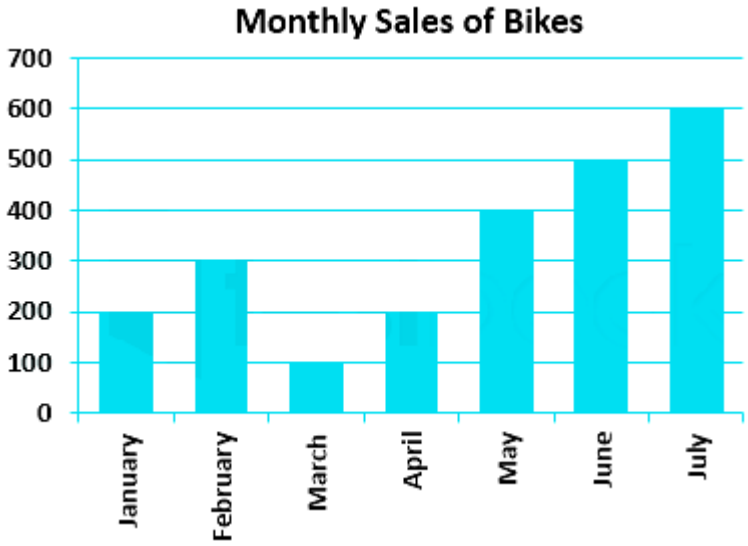
b. 91%

c. 71%

d. 17%

---

89. The graph below represents number of bikes sold over a period of seven months. Observe the graph and answer the question that follows: **(+1, -0.33)**



In which month was the percentage sales compared to the previous month, the highest?

a. July

b. May

c. February

d. June

---

90. Select the number from among the given options that can replace the question mark (?) in the following series. **(+1, -0.33)**

47, 64, 448, ?, 2315, 2328, 6984

a. 461

b. 465

c. 463

d. 459

---

91. Select the number from among the given options that can replace the question mark (?) in the following series. **(+1, -0.33)**

439, 503, 628, 844, ?

a. 1817

b. 1187

c. 1893

d. 1983

---

92. Read the given statement and assumptions carefully. Assuming that the information given in the statement is true, even if it appears to be at variance with commonly known facts, decide which of the given assumptions logically follow(s) from the statement. **(+1, -0.33)**

Statement:

During exams, invigilators are not supposed to use mobile phones in the examination hall.

Assumptions:

I. Mobile disturbs students during examination.

II. Keeping mobiles switched off helps to improve their vigilance.

a. Only II follows

b. Both I and II follows

c. Only I follows

d. Neither I nor II follows.

---

93. Among the four numerical expressions given below, three are alike in some manner and one is different. Select the odd one. (+1, -0.33)

a. 7 4 9 3 = 23

b. 8 4 3 7 = 22

c. 6 5 8 9 = 28

d. 5 4 2 5 = 51

---

94. S is a female member of a family and has three children. M is the son of S. M is the maternal uncle of two girls who are not sisters, but whose mothers are siblings. Based on the information provided, which of the following statements is most likely to be true? (+1, -0.33)

a. S has one son, one daughter and third cannot be determined.

b. S has two sons, one daughter.

c. S has one son, two daughters.

d. S has one son, and the other two cannot be determined.

---

95. As of this year, the average age of a family of 8 members is 39 years. Assuming that after six years the family adopts a new-born baby, what will be the average age of the family 10 years from now? (+1, -0.33)

a. 44 years

b. 46 years 8 Months

c. 49 years 6 Months

d. 49 years

96. Select the option that is related to the third number-cluster in the same way as the second number-cluster is related to the first number-cluster. (+1, -0.33)

7591 : 5719 :: 5937 : ?

a. 5973

b. 3795

c. 9573

d. 9537

97. There are 100 questions in which each right answer has 1 mark credit. Out of 100 questions 30, 50 and 20 questions are easy, medium and difficult respectively. The question paper covers five abilities with an equal number of questions and similar distribution of difficulty levels for each ability. Sachin has excellent knowledge in three abilities but in the other two abilities he can solve only easy questions. If the evaluator deducts 0.33 marks for each wrong answer and Sachin attempts all questions, which of the following would be his expected score? (+1, -0.33)

a. 62.60

b. 62.98

c. 62.76

d. 62.49

98. Among the four numbers given below, three are alike in some manner and one is different. Select the odd one. (+1, -0.33)

a. 187

b. 165

c. 143

d. 159

---

99. Select the number from the given options that is related to the third number in the same way as the second number is related to the first number. (+1, -0.33)

18 : 27 :: 28 : ?

a. 42

b. 54

c. 48

d. 36

---

100. Select the number from among the given options that can replace the question mark (?) in the following series. (+1, -0.33)

6, 10, 20, 24, 48, 52, (?)

a. 64

b. 104

c. 100

d. 56

Answers

1. **Answer: d**

Explanation:

The logic followed here is:-

- Tezpur is a city located in Assam.
- Similarly, Kochi is a city located in the state of Kerala.

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

---

2. **Answer: a**

Explanation:

Given

Speed of train = 240 km/h

Time = 5 hours

Formula used

Speed = Distance/Time

1 Km = 1000 m

1 hour = 60 minutes

Calculation

Distance cover by train in 1 hour = 240 km

Distance cover by train in 5 hour = 240 × 5 km

⇒ 1200 km

Time taken by flight to cover 1200 km = 45/60

⇒ 3/4 hour

speed of flight = 1200/(3/4)

⇒ (1200/1) × (4/3)

⇒ 1600 km/h

∴ A flight has to cover the same distance in 45 mins, it must travel at a speed of 1600 km/h

---

3. **Answer: b**

Explanation:

Given

area of a square field = 7200 m 2

Formula used

Area of square = $(side)^2$

Diagonal of square = $\sqrt{(side)^2 + (side)^2}$

Time = Distance/speed

Calculation

Distance cover = √7200 + 7200

⇒ √14400

⇒ 120 m

Speed of cycle = 4 km/h

⇒ (4 × 1000)/60

⇒ 400/6

⇒ (200/3) m/min

Time taken by cycle to cover 120 m = 120/(200/3)

⇒ (120/1) × (3/200)

⇒ 360/200

⇒ 9/5 minutes

∴ 9/5 minutes will a cycle take to cross the field diagonally at a constant rate of 4 km/h

---

4. Answer: c

Explanation:

Given

sumof the interior angles of a polygon = 3240°

Concept used

Sum of the interior angles of a polygon = (n - 2) × 180°

where n is the number of sides of a polygon

Calculation

3240 = (n - 2) × 180

⇒(n - 2) = 3240/180

⇒ n - 2 = 18

⇒ n = 18 + 2

⇒ n = 20

∴ Polygon have 20 sides.

---

5. Answer: a

Explanation:

Given

3x + 4 × 8 ÷ 9 = x ÷ 3 – 1

Concept

BODMAS

B	bracket, [,{, (
O	'OF
D	Division, ÷
M	Multiply, ×
A	Addition, +
S	subtraction, -

Calculation

3x + 4 × 8 × $\frac{1}{9}$ = x × $\frac{1}{3}$ - 1

⇒ 3x + 32/9 = x/3 - 1

⇒ 3x - (x/3) = - 1- (32/9)

⇒ (9x - x)/3 = (-9 - 32)/9

⇒ 8x/3 = -41/9

⇒ x = (-41/9) × (3/8)

⇒ x = -41/24

∴ The value of x is - 41/24

---

6. **Answer: c**

Explanation:

The correct answer is G Madhavan Nair.

- G Madhavan Nair was the chairman of ISRO when ISRO launched India's first lunar probe mission in October 2008.

⭐ Key Points

- **On 22 October 2008** , in its fourteenth flight from Satish Dhawan Space Center (SDSC) SHAR, Sriharikota, the Indian Space Research Organization (ISRO) Polar Satellite Launch Vehicle, PSLV-C11 successfully launched the 1380 kg Chandrayaan-1.
    - The spacecraft is placed in a transfer orbit with a perigee (closest point to Earth) of 255 km and an apogee (farthest point from Earth) of 22,860 km, inclined at an angle of 17.9° to the equator.

⭐ Additional Information

ISRO Chairman	Tenure
Dr. Vikram Sarabhai	From 1963 to 1971
Prof. M. G. K. Menon	From Jan 1972 to Sept 1972
Prof. Satish Dhawan	From 1972 to 1984
Prof. U. R. Rao	From 1984 to 1994
Dr. K. Kasturirangan	From 1994 to 2003
G. Madhavan Nair	From 2003 to 2009
Dr. K. Radhakrishnan	From 2009 to 2014
A. S. Kiran Kumar	From 2015 to 2018
Dr K. Sivan	From Jan 2018 to Jan 2022
S Somanath	**12 Jan 2022 to -**

7. **Answer: c**

Explanation:

Given

180 ÷ 20 {(15 – 6) + (24 – 18)}

Concept

BODMAS

Calculation

180 ÷ 20 {(15 – 6) + (24 – 18)} is

180 ÷ 20 {(9 + 6)}

⇒ 180 ÷ 20 (15)

⇒ 180 ÷ 300

⇒ 180 × (1/300)

⇒ 18/30

⇒ 9/15

∴ The value of 180 ÷ 20 {(15 – 6) + (24 – 18)} is 9/15.

⭐ **Mistake Points**

Calculation Mistake :

⇒ 180 ÷ 20 (15)

Now remember 15 is still in the bracket, so will have to multiply it first by 20. [Mistake Point: Don't divide 180 ÷ 20], we get

⇒ 180 ÷ 300

⇒ 180 × (1/300)

⇒ 18/30

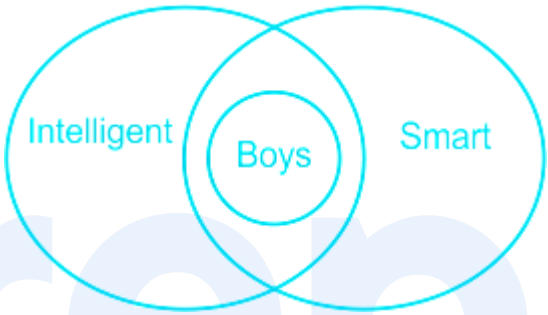
⇒ 9/15

---

8. **Answer: d**

Explanation:

The least possible Venn Diagram is as follows:-



Conclusions:

1. Some boys are smart and intelligent.→ True (Using the Venn diagram, we can see that all boys are smart and intelligent then some boys are smart and intelligent is definite true.)

Note: All A are B means Some A are B.

2. All intelligent are smart.→ False (it is possible but not definite)

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

---

9. **Answer: c**

Explanation:

Given

$x^2 + 1 = 2x$

Calculation

$x^2 + 1 = 2x$

$\Rightarrow x^2 - 2x + 1 = 0$

$\Rightarrow x^2 - x - x + 1 = 0$

$\Rightarrow x(x - 1) - 1(x - 1) = 0$

$\Rightarrow (x - 1)(x - 1) = 0$

$\Rightarrow x = 1$ and $x = 1$

Value of $x - \left(\frac{1}{x}\right)$

$\Rightarrow 1 - (1/1)$

$\Rightarrow 1 - 1$

$\Rightarrow 0$

$\therefore x - (1/x)$ is 0.

---

10. Answer: d

Explanation:

Given

$[3 \div 5 - 8 \text{ of } 4 + 3 \times \{8 \div 2 - (4 + 3)\}]$

Concept

BODMAS

B	bracket, [,{,(
O	'OF'
D	division, ÷
M	multiply, ×
A	addition, +
S	subtraction, _

Calculation

[3 ÷ 5 – 8 of 4 + 3 × {8 ÷ 2 – (4 + 3)}]

⇒ [3 × (1/5) - 8 × 4 + 3 × {8 × (1/2) - (7)}

⇒ [(3/5) - 32 + 3 × {4 - 7}

⇒ [(3/5) - 32 + 3 × (-3)

⇒ [(3/5) - 32 - 9]

⇒ (3 - 160 - 45)/5

⇒ - 202/5

∴ The value of [3 ÷ 5 – 8 of 4 + 3 × {8 ÷ 2 – (4 + 3)}] is -202/5

---

11. Answer: b

Explanation:

Concept

First taken the L.C.M of the given numbers and then subtract 25 from the L.C.M.

Calculation

Factors of 25 = 5 × 5

Factors of 36 = 2 × 2 × 3 × 3

Factors of 40 = 2 × 2 × 2 × 5

L.C.M of 25, 36 and 40 = 2 × 2 × 2 × 3 × 3 × 5 × 5

⇒ 1800

Subtract 25 from the L.C.M, then we will get the smallest number on which we add 25, then the number will be exactly divisible by 25, 36 and 40.

⇒ 1800 - 25

⇒ 1775

∴ 1775 will be smallest number, which on adding 25 to it, is exactly divisible by 25, 36 and 40

---

12. Answer: c

Explanation:

The correct answer is Vladimir Putin.

- Vladimir Putin got elected as the Head of the State four times.

⭐ Key Points

President	Term of office	Term
Boris Yeltsin	10 July 1991 – 31 December 1999 (resigned from the office) (8 years, 174 days)	1 (1991)
		2 (1996)
Vladimir Putin	**7 May 2000 – 7 May 2008 (acting from 31 December 1999) (8 years, 128 days)**	**1 (2000)**
		2 (2004)
Dmitry Medvedev	7 May 2008 – 7 May 2012 (4 years, 0 days)	1 (2008)
Vladimir Putin	**7 May 2012 – Incumbent (term expires 7 May 2024) (9 years, 319 days)**	**3 (2012)**
		4 (2018)

⭐ Additional Information

- **Viktor Alekseevich Zubkov** is a Russian civil servant, politician and businessman who served as the 36th Prime Minister of Russia from September 2007 to May 2008.
    - He was Vladimir Putin's first deputy prime minister during the presidency of Dmitry Medvedev.
- **Boris Nikolayevich Yeltsin** was a Russian and Soviet politician who served as the first President of the Russian Federation from 1991 to 1999.
    - He was a member of the Communist Party of the Soviet Union from 1961 to 1990.
- **Dmitry Anatolyevich Medvedev** is a Russian politician serving as Deputy Chairman of the Security Council of Russia since 2020.
    - Medvedev served as President from 2008 to 2012 and as Prime Minister from 2012 to 2020.

- Medvedev was elected president in the 2008 election.

---

13. **Answer: b**

Explanation:

The correct answer is**push**.

- **People migrate** for a better economic and social life. There are two sets of factors that influence migration.
  - The Push factors make the place of origin seem less attractive for reasons like unemployment, poor living conditions, political turmoil, unpleasant climate, natural disasters, epidemics and socio-economic backwardness.
  - The **Pull factors** make the place of destination seem more attractive than the place of origin for reasons like better job opportunities and living conditions, peace and stability, security of life and property, and a pleasant climate.

⭐ Additional Information

- When people move from one place to another, the place they move from is called the **Place of Origin,** and the place they move to is called the **Place of Destination** . The place of origin shows a decrease in population while the population increases in the place of destination. Migration may be interpreted as a spontaneous effort to achieve a better balance between population and resources.
  - **Emigration** : Migrants who move out of a place are called Emigrants
  - **Immigration** : Migrants who move into a new place are called Immigrants.
  - It may take place from rural to rural areas, rural to urban areas, urban to urban areas and urban to rural areas.
  - Migration may be permanent, temporary or seasonal.

---

14. **Answer: a**

Explanation:

According to the given information-

Name of persons- A, E, C, H and L

- A likes to work with → C and H
- E likes to work with → C
- C likes to work with → E

 Also, H and L does not like to work with anyone.

Clearly, L is left isolated as he does not like to work with anyone and no one likes to work with L..

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

---

15. Answer: a

Explanation:

The correct answer is**Human Body**.

- **The human body is NOT an example of an insulator**.

⭐ **Key Points**

- **Electric charges** do not flow freely through **insulators** .
  - This is an ideal quality in many cases—strong insulators are often used to coat or provide a barrier between conductors to keep electric currents under control.
  - This can be seen in rubber-coated wires and cables.

⭐ **Important Points**

- The most effective electrical insulators are:
  - **Rubber**

- **Glass**
- Pure water
- Oil
- Air
- **Diamond**
- Dry wood
- Dry cotton
- Plastic
- Asphalt

---

16. **Answer: b**

Explanation:

Given

Distance = 500 m

Time = 10 minutes

Formula used

Speed = Distance/time

1 Hour = 60 minutes

1 km= 1000 m

Calculation

Distance = (500/1000)km

⇒ 1/2 km

Time = (10/60)hours

Speed = (1/2)/(10/60)

⇒ (1/2) × (60/10)

⇒ 3 km/h

∴ T he person's speed be in kilometres per hour is 3 km/h

---

17. Answer: a

Explanation:

The statement highlights the problem that a lot of people drive on the wrong side of the road.

- From the statement, we cannot conclude that drivers do not know which side they are supposed to drive because the statement has used the words '***wrong***' and "***these days***". It means that the drivers know they are driving on the wrong side but still, they are practicing it and they have started doing it these days.
- If people drive on the wrong side of the road, it is obvious that the possibility of accidents will be high. Thus, conclusion II follows.

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

---

18. Answer: b

Explanation:

Given

$\sqrt{(1 + \cos 2A)/(1 - \cos 2A)}$

Formula used

$\cos 2A = \cos^2 A - \sin^2 A$

$\sin 2A = 2 \sin A \cos A$

$\cos^2 A + \sin^2 A = 1$

Calculation

$\sqrt{\frac{1+\cos 2A}{1-\cos 2A}}$

$\Rightarrow \sqrt{(1 + \cos 2A) \times (1 + \cos 2A)/(1 - \cos 2A)\ (1 + \cos 2A)}$

$\Rightarrow \sqrt{(1 + \cos 2A)^2/[(1)^2 - (\cos^2 2A)}$

$\Rightarrow (1 + \cos 2A)/\sin 2A$

$\Rightarrow (\cos^2 A + \sin^2 A + \cos^2 A - \sin^2 A)/\sin 2A$

$\Rightarrow 2\cos^2 A / 2 \sin A \cos A$

$\Rightarrow \cos A/\sin A$

$\Rightarrow \cot A$

∴ The value of $\sqrt{\frac{1+\cos 2A}{1-\cos 2A}}$ is cot A.

⭐ Shortcut Trick

Use $\cos 2A = \cos^2 A - \sin^2 A$

$\sqrt{\frac{1+\cos 2A}{1-\cos 2A}} = \sqrt{\frac{1+\cos^2 A-\sin^2 A}{1-(\cos^2 A-\sin^2 A)}}$

$\sqrt{\frac{\cos^2 A+\cos^2 A}{\sin^2 A+\sin^2 A}} \Rightarrow \sqrt{\frac{2\cos^2 A}{2\sin^2 A}}$

$\Rightarrow \cot A$

---

19. Answer: b

Explanation:

The correct answer is Transmission Control Protocol/Internet Protocol.

- TCP/IP stands for Transmission Control Protocol/Internet Protocol.

- TCP/IP is a set of standardized rules that allow computers to communicate on a network such as an internet.

⭐ Key Points

- **The Internet Protocol Suite** , commonly known as TCP/IP, is the set of communication protocols used in the Internet and similar computer networks.
  - The current basic protocols in the suite are Transmission Control Protocol (TCP) and Internet Protocol (IP).
- **Web browser or Internet browser,** the browser is a software program for rendering and exploring content on the World Wide Web.
  - These pieces of content, including images, videos, and web pages, are linked using hyperlinks and classified with URIs (Uniform Resource Identifiers).
  - This page is an example of a web page that can be viewed using a browser.
  - **List of some Internet browsers:**
    - Google Chrome
    - Microsoft Edge
    - Microsoft Internet Explorer
    - Mozilla Firefox
    - Opera
    - Apple Safari
    - Amazon Silk

---

20. Answer: a

Explanation:

Given

Cost price of 120 pens = selling price of x pens

Concept

Profit and loss

Formula used

selling price = cost price + Profit

Calculation

let the cost price of 120 pens = Rs.100

cost price of 1 pen = (100/120)

cost price of x pens = 100x/120

selling price of x pens = Rs. 100

Selling price = cost price + 25% of profit

100 = 100x/120 + 25% of (100x/120)

⇒ 100 = (100x/120) + (25x/120)

⇒ 100 = (100x + 25x)/120

⇒ 100 = 125x/120

⇒ x = (100 × 120)/125

⇒ x = 96

∴ The value of x is 96.

---

21. **Answer: b**

Explanation:

Given

x cos 45° sin 120° + sin 60 ° = –x sin 90° + 1

identities

cos 45° = 1/√2

$\sin 120° = \sqrt{3}/2$

$\sin 60° = \sqrt{3}/2$

$\sin 90° = 1$

Calculation

$x \cos 45° \sin 120° + \sin 60° = -x \sin 90° + 1$

$x \times (1/\sqrt{2}) \times (\sqrt{3}/2) + (\sqrt{3}/2) = -x \times 1 + 1$

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

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

$\Rightarrow (\sqrt{3}x + 2\sqrt{2}x)/2\sqrt{2} = (2 - \sqrt{3})/2$

$\Rightarrow x(\sqrt{3} + 2\sqrt{2})/\sqrt{2} = (2 - \sqrt{3})$

$\Rightarrow x = \sqrt{2}(2 - \sqrt{3})/(\sqrt{3} + 2\sqrt{2})$

$\Rightarrow x = (2\sqrt{2} - \sqrt{6})/(2\sqrt{2} + \sqrt{3})$

$\therefore x$ is $(2\sqrt{2} - \sqrt{6})/(2\sqrt{2} + \sqrt{3})$

---

22. Answer: c

Explanation:

The correct answer is **Hemodialysis**.

- **Hemodialysis is a procedure where a dialysis machine and a special filter called an artificial kidney, or a dialyzer, are used to clean your blood**.
  - **Dialysis** is a procedure to remove waste products and excess fluid from the blood when the kidneys stop working properly.
  - It often involves diverting blood to a machine to be cleaned.

⭐ Key Points

- **Kidneys** are two reddish-brown bean-shaped organs found in vertebrates.
  - They receive blood from **paired renal arteries; Blood exits in paired renal veins** .
  - Each kidney is connected to a ureter, a tube that carries excreted urine to the bladder.
  - **Function of Kidneys:**
    - Formation of urine
    - Hormone secretion
    - Blood pressure regulation
    - Acid–base balance
    - Regulation of osmolality
    - Measuring function
    - Clinical significance

⭐ Additional Information

- **Excretion** is a general term referring to the separation and throwing off of waste materials or toxic substances from the cells and tissues of a plant or animal.
- **Metabolism** is the process by which your body converts the food you eat into energy.
  - During this complex process, the calories in food and beverages are combined with oxygen to release the energy your body needs to function.
- **The circulatory system** is a system of organs that includes the heart, blood vessels, and blood that circulates throughout the body of a human or other vertebrate.
  - This includes the cardiovascular system, or vascular system, which consists of the heart and blood vessels.

---

23. Answer: a

Explanation:

The correct answer is193.

- As of 31st October 2020, the United Nation comprises 193 member states.

⭐ Key Points

- **The United Nations** is the largest intergovernmental organization in the world.
  - The United Nations Organization (UNO) or just United Nations (UN) is an intergovernmental organization whose purpose is to maintain international peace and security, develop friendly relations among nations, achieve international cooperation, and be a centre for harmonizing the actions of nations.
  - It is the largest and most familiar international organization in the world.
  - The United Nations is headquartered on the international arena in New York City, and has other main offices in Geneva, Nairobi, Vienna and The Hague (home of the International Court of Justice).

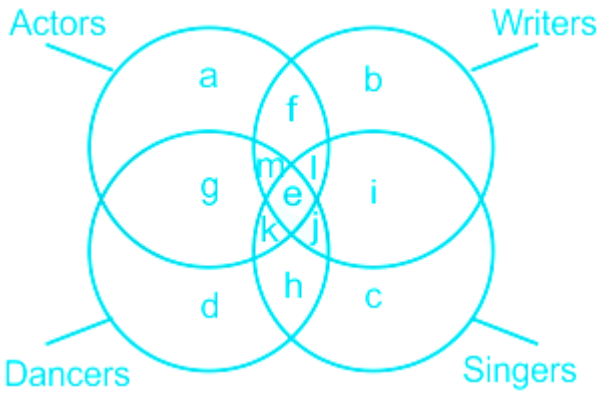
⭐ Additional Information

Organization	Headquarters	Year of Establishment
United Nations Organization	New York (USA)	1945
United Nations Children's' Fund	New York (USA)	1946
United Nations Conference on Trade and Development	Geneva (Switzerland)	1964
United Nations Educational Scientific and Cultural Organization	Paris (France)	1945
World Meteorological Organization	Geneva (Switzerland)	1950
Organization of Petroleum Exporting Countries	Vienna (Austria)	1960
International Monetary Fund	Washington DC (USA)	1945
World Bank	Washington DC (USA)	1945
International Maritime Organization	London (UK)	1959
Amnesty International	London (UK)	1961
International Court of Justice	The Hague (Netherlands)	1945
Food and Agricultural Organization	Rome (Italy)	1945
North Atlantic Treaty Organization	Brussels (Belgium)	1949

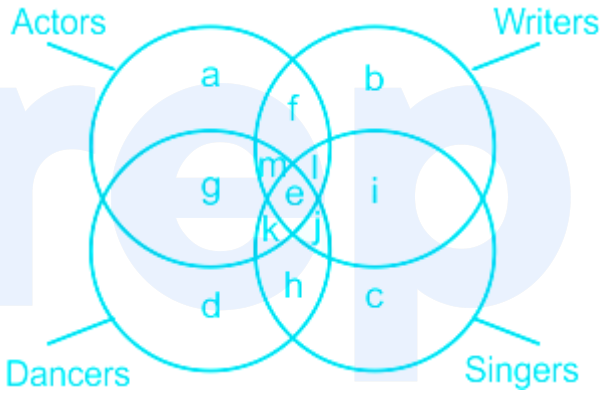
24. **Answer: c**

Explanation:

- Region which is common to writers, singers and dancers = e + j



- Region that includes writers, singers, and dancers, but not actors is :-



Thus, region 'j' represents writers, singers and dancers but does not include actors.

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

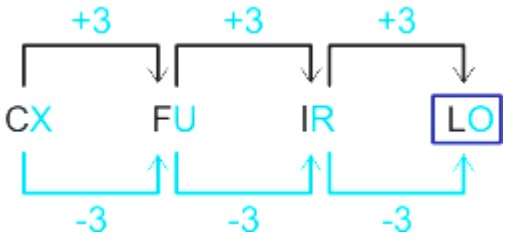
---

25. 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 logic followed here is:



Hence, 'option 3' is the correct answer.

---

26. Answer: b

Explanation:

Given

Spends = 10% of total income

Saving = Rs. 5400

Concept

Income = Expenditure + saving

Calculation

Let the total income is Rs. x

x = 10% of x + 5400

⇒ x - 10% of x = 5400

⇒ 90x/100 = 5400

⇒ x = (5400 × 100)/90

⇒ x = 6000

∴ Ashoka monthly income is Rs. 6000

27. **Answer: b**

Explanation:

The correct answer is**1993**.

- The National Human Rights Commission (NHRC) of India was established on 12 October, 1993.

⭐ Key Points

- **The statute under which it is established is the Protection of Human Rights Act (PHRA)** , 1993 as amended by the Protection of Human Rights (Amendment) Act, 2006.
  - It is in conformity with the Paris Principles, adopted at the first international workshop on national institutions for the promotion and protection of human rights held in Paris in October 1991, and endorsed by the General Assembly of the United Nations by its Regulations 48/134 of 20 December, 1993.
  - The NHRC is an embodiment of India's concern for the promotion and protection of human rights.
  - **Section 2(1)(d)** of the PHRA defines Human Rights as the rights relating to life, liberty, equality and dignity of the individual guaranteed by the Constitution or embodied in the International Covenants and enforceable by courts in India.

⭐ Additional Information

Regulatory Body	Headquarters, Established year
Reserve Bank of India (RBI)	Mumbai, 1st April 1935
National Bank for Agriculture and Rural Development (NABARD)	Mumbai, 12th July 1982
NITI Aayog	New Delhi, 1st January 2015
National Housing Bank (NHB)	New Delhi, 9 July 1988
Insurance Regulatory and Development Authority (IRDAI)	Hyderabad, 1999
Securities and Exchange Board of India (SEBI)	Mumbai, 12 April 1992.
Small Industries Development Bank of India (SIDBI)	Lucknow, 2 April 1990
Telecom Regulatory Authority of India (TRAI)	New Delhi, 20 February 1997
Bureau of Indian Standards (BIS)	New Delhi, 23 December 1986
Board of Control for Cricket in India (BCCI)	Mumbai, December 1928
Food Safety and Standards Authority of India (FSSAI)	New Delhi, August 2011

---

28. Answer: c

Explanation:

The correct answer is Luna 9.

- Luna 9 was the first spacecraft to achieve a lunar soft landing and to transmit photographic data from the Moon's surface to Earth, preceding the U.S. Surveyor 1 soft lander by about 4 months.

⭐ Additional Information

- **Apollo 17** was the final mission of NASA's Apollo program, the most recent time humans have set foot on the Moon or traveled beyond low Earth orbit.
- **Sputnik 25** was originally designated Sputnik 33 in the U.S. Naval Space Command Satellite Situation Summary.
- **Ranger 6** was a lunar probe in the NASA Ranger program, a series of robotic spacecraft of the early and mid-1960s to obtain the first close-up images of the Moon's surface.

⭐ Important Points

- **Yuri Alekseyevich Gagarin** was a Soviet pilot and cosmonaut who became the first human to journey into outer space.
- **Sputnik 1** was the first artificial Earth satellite.
  - It was launched into an elliptical low Earth orbit by the Soviet Union on **4 October 1957** as part of the Soviet space program.

---

29. **Answer: b**

Explanation:

Karmais NOT correct.

- As of 2021, apart from Mother India, only two Indian films have been nominated for the Oscars—Salaam Bombay! (1988) and Lagaan (2001).

⭐ Key Points

- At the 30th Academy Awards, **Mehboob Khan's 1957 Hindi-language film Mother India** was India's first submission for the Academy Award for the Best International Feature Film category.
  - It was nominated along with four other films and lost by one vote to the Italian film Knights of Cabiria (1957).
  - In 1982, the National Film Development Corporation of India was instrumental in co-producing the **Richard Attenborough** biographical film

Gandhi.

- **Bhanu Athaiya** became the first Indian to win an Academy Award for costume design at the 55th Academy Awards.
- Ravi Shankar was nominated for Best Original Score for the same film. As of 2021, apart from Mother India, only two Indian films have been nominated for an Oscar – Salaam Bombay! (1988) and Lagaan (2001).

⭐ Additional Information

- **The Academy Awards** , popularly known as the Oscars, are awards given for artistic and technical merit in the film industry.
  - First awarded May 16, 1929
  - **Oscars 2021 Winners List**
    - Best Picture: Nomadland
    - Best Actor: Anthony Hopkins – The Father
    - Best Actress: Frances McDormand – Nomadland

---

30. **Answer: c**

Explanation:

Given

48 and 65

Concept

Find the factors of 45 and 65

Calculation

Factors of 48 = 2 × 2 × 2 × 2 × 3

Factors of 65 = 5 × 13

L.C.M of 48 and 65 = 2 × 2 × 2 × 2 × 3 × 5 × 13

⇒ 3120

∴ The LCM of 48 and 65 is 3120

---

31. Answer: b

Explanation:

The correct answer is **Uruk**.

- The main sites of the Indus Valley Civilization are Rakhigarhi (first site with genetic testing), Sanauli, Farmana, Kalibangan,**Lothal**, Dholavira, Mehrgarh,**Harappa**, Chanhudaro and**Mohenjo-Daro**.

⭐ **Key Points**

- **Uruk, also known as Warka or Warkah, was an ancient city of Sumer (and later of Babylonia) situated east of the present bed of the Euphrates River** on the dried-up ancient channel of the Euphrates 30 km east of modern Samawah, Al-Muthannā, Iraq.
  - Uruk is the type site for the Uruk period.

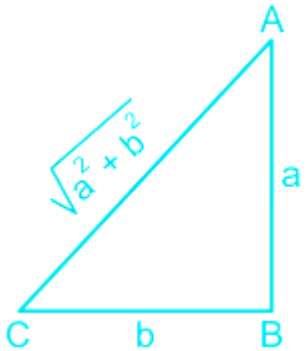
⭐ **Additional Information**

Major Sites of Indus Valley Civilization

Year	Site	Location	Excavated by
1921	Harappa	Sahiwal District, Punjab in the banks of Ravi	Daya Ram Sahni
1922	Mohenjo-Daro	Larkana District Of Sind on the bank of Indus	R. D Banerjee
1953	Kalibangan	Hanumangarh District, Rajasthan on the bank of Ghaggar river	Amlanand Ghose
1953	Lothal	Gujarat on Bhogva river near the Gulf of Cambay	R. Rao
1964	Surkotada	Gujarat	J P Joshi
1974	Banawali	Fatehabad district of Haryana	R S Bisht
1985	Dholavira	Gujarat in Rann of Kutchchh	R S Bisht

32. **Answer: c**

Explanation:



Given

$a \cot \theta = b$

Formula used

cos θ = Side adjacent to θ/Hypotenuse

Calculation

In triangle ABC

$(AC)^2 = AB^2 + BC^2$

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

$AC = \sqrt{a^2 + b^2}$

cot θ = b/a

cos θ = BC/AC

$\cos\theta = b/(\sqrt{a^2 + b^2})$

sin θ = AB/AC

$\sin\theta = a/(\sqrt{a^2 + b^2})$

$\frac{a\cos\theta - b\sin\theta}{a\cos\theta + b\sin\theta}$

$\Rightarrow [\{a \times b/(\sqrt{a^2 + b^2})\} - \{b \times a/(\sqrt{a^2 + b^2})\}] / [\{a \times b/(\sqrt{a^2 + b^2})\} + \{b \times a/(\sqrt{a^2 + b^2})\}]$

$\Rightarrow [\{ab/(\sqrt{a^2 + b^2})\} - \{ab/(\sqrt{a^2 + b^2})\}] / [a \times b/(\sqrt{a^2 + b^2}) + b \times a/(\sqrt{a^2 + b^2})]$

$\Rightarrow 0/[a \times b/(\sqrt{a^2 + b^2}) + b \times a/(\sqrt{a^2 + b^2})]$

⇒ 0

∴ the value of $\frac{a\cos\theta - b\sin\theta}{a\cos\theta + b\sin\theta}$ is 0

---

33. Answer: c

Explanation:

The correct answer is **Fishes have double circulation.**

⭐ **Key Points**

- In fish, the system has only one circuit, with the blood being pumped through the capillaries of the gills and onto the capillaries of the body tissues.
  - **This is known as single cycle circulation**. Hence, option 3 is incorrect.
  - **The heart of fish is therefore only a single pump (consisting of two chambers)**.
    - Fishes have only a two-chambered heart with an atrium and a ventricle, and the chambers of the heart which receive the blood from body tissues are called auricles. Fishes respire through their gills.
  - In the heart of fish,**blood goes only once in a cycle because their heart is of two chambers.**
    - They carry oxygen through the gills where the blood is oxygenated and through the heart to the rest of the body.
  - Fish have a closed-loop circulatory system.
  - **The atrium collects blood that has returned from the body and the ventricle pumps the blood to the gills where gas exchange occurs and the blood is re-oxygenated**; this is called gill circulation.

⭐ **Additional Information**

- **Birds and mammals** - Four-chambered heart, having two auricles and two ventricles.
- **Reptiles** - three-chambered heart (except crocodile which has 4 chambered heart).
- **Fishes** - Two chambered hearts.
- **Dolphin** - Mammal has a four-chambered heart.
- **Salamander** - Amphibian has a three-chambered heart.

---

34. Answer: d

Explanation:

The correct answer is **Bank of Hindustan**.

- **The oldest bank in India is The Madras Bank (1683), followed by the Bank of Bombay, founded in 1720, which is then followed by the Bank of Hindustan, founded in 1770 .**

⭐ Key Points

- **Bank of Hindustan:**
  - The Bank of Hindustan (1770-1832), set up by the agency house of Alexander and Company in the year 1770 was the first bank established in India.
  - It was no longer exists now.

⭐ Additional Information

- **Bank of Baroda** is an Indian nationalized banking and financial services company.
  - Founded -20 July 1908
  - Founder -Sayajirao Gaekwad III
  - Headquarters -Vadodara, Gujarat, India
- **State Bank of India :**
  - It is the largest public sector bank in India.
  - It began with the establishment of the Bank of Calcutta in Calcutta, on 2 June 1806.
  - It was the first-ever joint-stock bank of British India, established under the sponsorship of the Government of Bengal.
- **Indian Bank** is a major nationalized bank. It is owned by the Ministry of Finance, Government of India.
  - It was established in 1907 and is headquartered in Chennai, India.

---

35. Answer: d

Explanation:

Given

$8 + (\frac{1}{2} + \frac{1}{4}) \times 16$

Concept:

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

Calculation

$\Rightarrow 8 + \frac{(2+1)}{4} \times 16$

$\Rightarrow 8 + \frac{3}{4} \times 16$

$\Rightarrow 8 + 12$

$\Rightarrow 20$

∴ The value of $8 + (\frac{1}{2} + \frac{1}{4}) \times 16$ is 20

---

36. 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 logic followed here is:-

$$P(16) + I(9) = Y(25)$$

$$S(19) + D(4) = W(23)$$

Similarly,

$$G(7) + N(14) = \boxed{U}(21)$$

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

---

37. Answer: d

Explanation:

The correct answer is Satyendra Nath Bose.

- Satyendra Nath Bose was an Indian mathematician and physicist specializing in theoretical physics.
    - He is best known for his work on quantum mechanics in the early 1920s, collaborating with Albert Einstein in developing the foundations of Bose-Einstein statistics and the theory of the Bose-Einstein condensate.

⭐ Additional Information

ISRO Chairman	Tenure
Dr. Vikram Sarabhai	From 1963 to 1971
Prof. M. G. K. Menon	From Jan 1972 to Sept 1972
Prof. Satish Dhawan	**From 1972 to 1984**
Prof. U. R. Rao	From 1984 to 1994
Dr. K. Kasturirangan	From 1994 to 2003
G. Madhavan Nair	From 2003 to 2009
Dr. K. Radhakrishnan	From 2009 to 2014
A. S. Kiran Kumar	**From 2015 to 2018**
Dr K. Sivan	**From Jan 2018 to Jan 2022**
S Somanath	12 Jan 2022 to -

38. **Answer: b**

Explanation:

The correct answer is **Millie Bobby Brown**.

- **On 20 November 2018, Emmy-nominated actress Millie Bobby Brown has been announced as UNICEF's newest Goodwill Ambassador** .
    - The appointment – marked on World Children's Day at United Nations Headquarters and the Empire State Building in New York – makes the 14-year-old UNICEF's youngest-ever Goodwill Ambassador.

⭐ Key Points

- **Millie Bobby Brown** is a British actress.
    - In 2018, Brown was featured on the Time 100 list of the world's most influential people and was appointed as a UNICEF Goodwill Ambassador, the youngest person ever elected to the position.

⭐ Important Points

- **List of UNICEF Goodwill Ambassadors**
    - Serbia Novak Djokovic (August 2015)
    - India Priyanka Chopra (December 2016)
    - Canada Lilly Singh (July 2017)
    - United Kingdom Millie Bobby Brown (November 2018)

⭐ Additional Information

- **Lily Singh** is a Canadian comedian, actress, former talk show host and YouTuber who formerly appeared under the pseudonym Superwoman, her longtime YouTube username. Born and raised in Scarborough, Ontario, Singh began making YouTube videos in 2010.
- **Novak Djokovic** is a Serbian professional tennis player.
    - He is currently ranked world No. 1 by the Association of Tennis Professionals as of 21 March 2022.
- **Priyanka Chopra Jonas** is an Indian actress, model and singer. The winner of the Miss World 2000 pageant, Chopra is one of the highest-paid actresses of India.

- He has received several awards, including two National Film Awards and five Filmfare Awards.

---

39. Answer: d

Explanation:

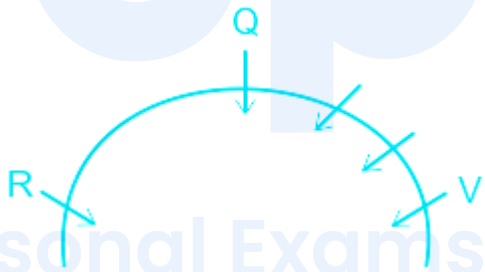
According to the information given in question,

1. Number of friends = 7

2. Three persons are sitting on the left-hand side of Q, of which V is the last one.

3. R and V are sitting on the corner sides.

So, this can be represented as-

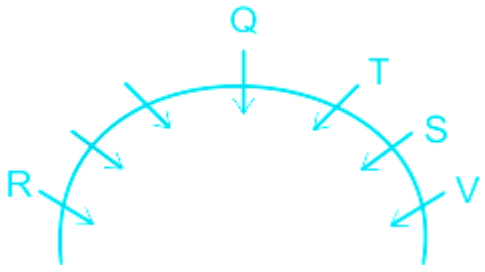


Also,

4. S and V are sitting beside each other.

5. More than two persons are sitting on the right-hand side of T, of which R is the last one.

So, the arrangement becomes-



Thus, two persons are sitting to the left of T and four persons are sitting to the right of T.

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

---

40. Answer: b

Explanation:

Given

$a : b = \sqrt{7} : \sqrt{3}$

Formula used

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

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

calculation

let $a = \sqrt{7}x$ and $b = \sqrt{3}x$

$(3 \times \sqrt{7}x + 2 \times \sqrt{3}x)/(3 \times \sqrt{7}x - 2 \times \sqrt{3}x)$

$[\{(3 \times \sqrt{7}x + 2 \times \sqrt{3}x) \times (3 \times \sqrt{7}x + 2 \times \sqrt{3}x)\}]/ [\{(3 \times \sqrt{7}x - 2 \times \sqrt{3}x) \times (3 \times \sqrt{7}x + 2 \times \sqrt{3}x)\}]$

$(3\sqrt{7}x)^2 + (2\sqrt{3}x)^2 + 2(3\sqrt{7}x)(2\sqrt{3}x)/\{(3\sqrt{7}x)^2 - (2\sqrt{3}x)^2\}$

$(63x^2 + 12x^2 + 12\sqrt{21}x^2)/(63x^2 - 12x^2)$

$(75 + 12\sqrt{21})/51$

$(25 + 4\sqrt{21})/17$

Check option 2

$(2 + \sqrt{21})/(-2 + \sqrt{21})$

Rationalize multiply $(2 + \sqrt{21})$ both numerator and denominator

$\Rightarrow (2 + \sqrt{21})^2 / (-2 + \sqrt{21})(2 + \sqrt{21})$

$\Rightarrow (25 + 4\sqrt{21})/17$

$\therefore$ The value of $(3a + 2b) : (3a - 2b)$ is equal to $\frac{2+\sqrt{21}}{(-2+\sqrt{21})}$

---

41. Answer: b

Explanation:

Given

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

Calculation

$a/b = 3/7$

$a : b = 3 : 7$

let $a = 3x$ and $b = 7x$

$\frac{8a-b}{2a+3b}$

$[(8 \times 3x) - 7x]/[(2 \times 3x) + (3 \times 7x)]$

$\Rightarrow (24x - 7x)/(6x + 21x)$

$\Rightarrow 17x/27x$

$\Rightarrow 17/27$

$\therefore$ The value of $\frac{8a-b}{2a+3b}$ is 17/27

---

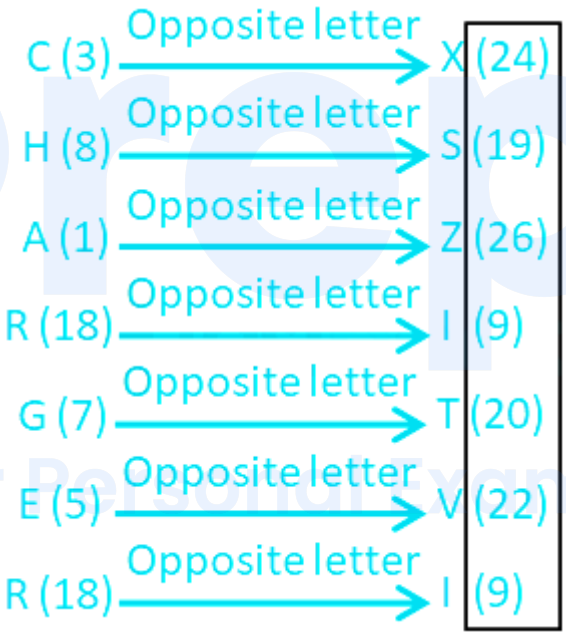
42. Answer: d

Explanation:

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

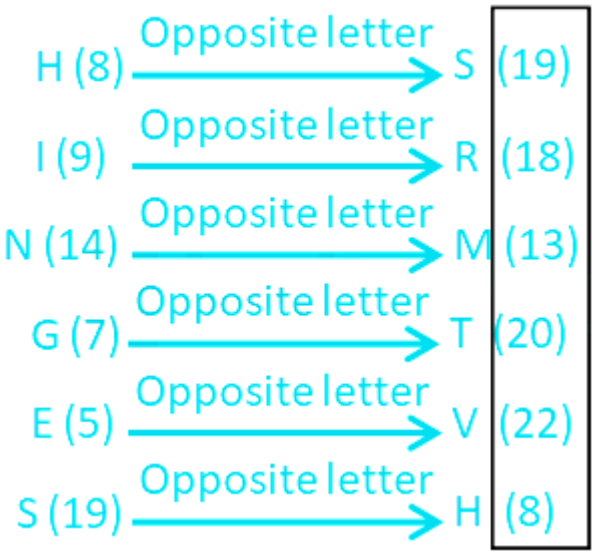
The logic followed here is:-

 Alphabets are written as the positional value of the opposite letter.



 And sum of 24 + 19 + 26 + 9 + 20 + 22 + 9 = 129

Similarly,



 Sum of 19 + 18 + 13 + 20 + 22 + 8 = 100

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

---

43. **Answer: a**

Explanation:

The correct answer is **White-collar workers**.

- **White Collar Worker**
  - **Those group of workers who is highly qualified and skilled and does mental work is called white-collar worker .**
  - These workers enjoy a high standard of living and better social status.

⭐ **Key Points**

- **Blue Collar Worker**
  - Those group of workers which is not so qualified and skilled and does physical work is called blue-collar worker.
  - They get relatively lesser wages.

---

44. **Answer: c**

Explanation:

The correct answer is**Kochi**.

⭐ **Key Points**

- **Kochi is known as the 'Queen of the Arabian Sea'**.
  - It was the **centre of the Indian spice trade for many centuries** .
  - Kochi was the centre of the Indian spice trade for many centuries and was known to the Yavanas (Greeks and Romans) as well as Jews, Syrians, Arabs, and Chinese since ancient times.

⭐ **Additional Information**

Cities	State	Nicknames of Cities
Mumbai	Maharashtra	City of Seven Islands Gateway of India Financial Capital of India
Visakhapatnam	Andhra Pradesh	City of Destiny Goa of the East
Kochi	Kerala	Queen of Arabian Sea

---

45. **Answer: c**

Explanation:

The correct answer is.gov.

- **Domain Name Types:**
  - .com – commercial business (the most common TLD)
  - .org – organizations (typically, nonprofit)
  - .gov – government agencies
  - .edu – educational institutions
  - .net – network organizations
  - .mil – military

⭐ Additional Information

- A **domain name** is an identification string that defines the scope of administrative autonomy, authority, or control within the Internet.
  - Domain names are used in a variety of networking contexts and for application-specific naming and addressing purposes.
  - In general, a domain name identifies a network domain, or it represents an Internet Protocol (IP) resource, such as a personal computer used to access the Internet, hosting a website.
  - A server computer, or the Web site itself, or any other service of communication through the Internet.

---

46. Answer: d

Explanation:

The correct answer isBhutan.

- Gross national happiness was first coined in 1972 by the fourth King of Bhutan, King Jigme Singye Wangchuck.
  - The concept implies that sustainable development should take a holistic approach to notions of progress and give equal importance to the non-economic aspects of well-being.
  - The Gross National Happiness Index, Bhutan sought to create a measurement tool that would be useful for policymaking and to create

policy incentives for the government, NGOs and businesses in Bhutan to increase GNH.

⭐ Additional Information

- The GNH measure has been designed to include nine core domains that are regarded as components of happiness in Bhutan and are constructed of indicators that are robust and informative with respect to each of the domains.
- The nine domains are:
  - Psychological well being.
  - Health.
  - Time use.
  - Education.
  - Cultural diversity and resilience.
  - Good Governance.
  - Community vitality.
  - Ecological diversity and resilience.
  - Living standard.

---

47. **Answer: c**

Explanation:

Given

Selling price of bike = Rs 42,000

Cost price of bike = Rs 30,000 + Rs.5000

Formula used

Profit = Selling Price - Cost Price

Calculation

Cost price = 30,000 + 5,000

⇒ Rs. 35000

Selling price = Rs 42,000

Profit = Rs. (42,000 - 35,000)

⇒ Rs. 7,000

Profit percentage = (7000/35000) × 100

⇒ 20%

∴ Gain percentage is 20%

---

48. Answer: b

Explanation:

The correct answer is Carbonic acid.

- **Carbon dioxide or CO_2** is filled in beverages like soft drinks to give a fizzy nature to the beverage.
  - The process of adding carbon dioxide gas to a beverage is called Carbonation.

⭐ Additional Information

Acids	Details
Citric acid	• Citric acid is an organic compound with the chemical formula $HOC(CH_2CO_2H)_2$. • It is a colourless weak organic acid. • Citric acid is found naturally in citrus fruits, **especially lemons and limes** .
Acetic acid	• Acetic acid is also known as ethanoic acid, ethylic acid, vinegar acid, and methane carboxylic acid. • It has the chemical formula of CH_3COOH.
Sulphuric acid	• Sulphuric acid, known in antiquity as oil of vitriol, is a mineral acid composed of the elements sulfur, oxygen and hydrogen, with the molecular formula H_2SO_4.

49. **Answer: a**

Explanation:

The correct answer is **Political Geography**.

⭐ **Key Points**

- **Political Geography is NOT a sub-field of economic geography**.
- **Political geography** is concerned with the study of both the spatially uneven outcomes of political processes and the ways in which political processes are themselves affected by spatial structures.
    - Conventionally, for the purposes of analysis, political geography adopts a three-scale structure with the study of the state at the center, the study

of international relations (or geopolitics) above it, and the study of localities below it.
    - The primary concerns of the subdiscipline can be summarized as the inter-relationships between people, state, and territory.
    - **Critical political geography** is mainly concerned with the criticism of traditional political geographies vis-a-vis modern trends.
    - As with much of the move towards 'Critical geographies', the arguments have drawn largely from postmodern, post-structural, and postcolonial theories.

⭐ Additional Information

- **Economic geography** is the subfield of human geography which studies economic activity and factors affecting them.
    - It can also be considered a subfield or method in economics.
    - There are four branches of economic geography.
    - There is the primary sector, Secondary sector, Tertiary sector, & Quaternary sector.
    - Economic geography takes a variety of approaches to many different topics, including the location of industries, economies of agglomeration (also known as "linkages"), transportation, international trade, development, real estate, gentrification, ethnic economies, gendered economies, core-periphery theory, the economics of urban form, the relationship between the environment and the economy (tying into a long history of geographers studying culture-environment interaction), and globalization.
    - **Sub-fields of Economic Geography are Geography of Resources, Geography of Agriculture, Geography of Tourism, Geography of Industries, Geography of Marketing, and Geography of International Trade** .

---

50. **Answer: d**

Explanation:

Given

x : y = 2 : 3

Calculation

let x = 2a and y = 3a

[(5 × 2a) + (3 × 3a)] : [(5 × 2a) - (3 × 3a)]

⇒ (10a + 9a) : (10a - 9a)

⇒ 19a : a

⇒ 19 : 1

∴ The value of (5x + 3y) : (5x – 3y) is 19 : 1.

---

51. Answer: d

Explanation:

The correct answer is **Indore**.

⭐ **Key Points**

- **Swachh Survekshan is an annual survey of cleanliness, hygiene, and sanitation in cities and towns across India**.
- **Swachh Survekshan 2020 declared Indore as India's cleanest city**.
- The government today announced the results of an annual survey of cleanliness, Swachh Survekshan 2020.
- Indore once again bagged the top spot as the cleanest city of India, the **fourth time in a row** .
- The second and third positions in the category were grabbed by **Surat and Navi Mumbai** respectively.
- The Swachh Survekshan awards 2020 were announced by Union Housing and Urban Affairs Minister Hardeep Singh Puri at a ceremony.

⭐ Additional Information

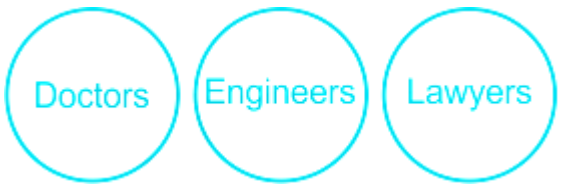
- **Swachh Survekshan** is a **ranking exercise** taken up by the Government of India to assess rural and urban areas for their levels of cleanliness and active implementation of Swachhata mission initiatives in a timely and innovative manner.
  - The objective of the survey is to encourage large-scale citizen participation and create awareness amongst all sections of society about the importance of working together towards making towns and cities a better place to live in.
  - Additionally, the survey also intends to foster a spirit of healthy competition among towns and cities to improve their service delivery to citizens, towards creating cleaner cities and towns.
  - The **Ministry of Urban Development, Government of India** takes up the Swachh Survekshan in urban areas and the Ministry of Drinking Water and Sanitation in rural areas.
  - The **Quality Council of India (QCI)** has been commissioned the responsibility of carrying out the assessment.
  - **Swachh Survekshan** was introduced by the **government with the objective of generating large-scale citizen participation** in the Mission, along with inculcating a spirit of healthy competition among cities towards becoming India's cleanest cities.

---

52. Answer: c

Explanation:

- Doctors, engineers and lawyers have no characteristics common to each other.
- Therefore, the best Venn diagram representation is as follows:-



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

---

53. Answer: a

Explanation:

The correct answer is **Amritsar**.

⭐ **Key Points**

- **Sri Guru Ram Dass Jee International Airport is located in Amritsar**.
- **Sri Guru Ram Das Ji International Airport** is an international airport about 11 kilometers northwest of the city of Amritsar, Punjab, India.
  - It is named after Guru Ram Das, the fourth Sikh Guru and the founder of Amritsar city.
  - **Amritsar Airport** is the largest and busiest airport in the Indian state of Punjab.
  - It is the second-largest airport in Northern India after Delhi Airport.
  - The airport was the **3rd fastest-growing airport** in India during the fiscal year 2017–18.
  - It is a hub of cargo movements, domestically and internationally.
  - The Airport is ranked the **6th-best regional airport** in India and Central Asia in 2019 and 2020 by Skytrax.
  - The airport is awarded as the best airport in Asia-Pacific in 2020 (2 to 5 million passengers per annum) by Airports Council International.

⭐ **Additional Information**

- **Guru Ram Das** (24 September 1534 – 1 September 1581) was the **fourth of the Ten Gurus of Sikhism** .
  - He was born on 24 September 1534 in a family-based in Lahore.
  - His birth name was **Jetha** , and he was orphaned at age seven; he thereafter grew up with his maternal grandmother in a village.
  - At age 12, Bhai Jetha and his grandmother moved to Goindval, where they met Guru Amar Das.

- The boy thereafter accepted Guru Amar Das as his mentor and served him.
- The daughter of Guru Amar Das married Bhai Jetha, and he thus became part of Guru Amar Das's family.
- As with the first two Gurus of Sikhism, Guru Amar Das instead of choosing his own sons chose Bhai Jetha as his successor and renamed him Ram Das or "servant of God."

---

54. Answer: a

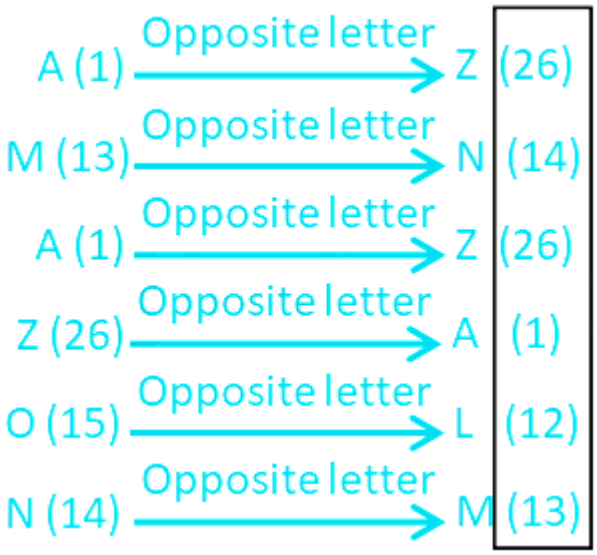
Explanation:

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

The logic followed here is:-

 Alphabets are assigned the positional value of the opposite letter or in the reverse alphabetical order.

- So, AMAZON can be written as:-



- Code for AMAZON will be 26142611213.
- Hence, ' **option 1**' is the correct answer.

---

55. Answer: d

Explanation:

The correct answer is **Atharvaveda**.

⭐ **Key Points**

- **The Vedas are considered the earliest literary record of Indo-Aryan civilization**.
- **There are four Vedas: Rigveda, Samaveda, Yajurveda and the fourth one is Atharvaveda**.
  - The **Atharva Veda** is the **"knowledge storehouse of atharvāṇas, the procedures for everyday life".**
  - The text is the fourth Veda but has been a late addition to the Vedic scriptures of Hinduism.
  - The language of the Atharvaveda is different from Vedic Sanskrit, preserving pre-Vedic Indo-European archaisms.
  - It is a collection of **730 hymns with about 6,000 mantras, divided into 20 books** .

- About a sixth of the Atharvaveda texts adapts verses from the Rigveda, and except for Books 15 and 16, the text is mainly in verse deploying a diversity of Vedic meters.

⭐ Additional Information

- **Dhanurveda** is a Sanskrit treatise on warfare and archery, traditionally regarded as a upaveda attached to Yajurveda (1100 – 800 BCE) and attributed either to Bhrigu or Vishvamitra, or Bharadwaj.
  - It is one among the four upavedas to Vedas (along with **Ayurveda, Gandharvaveda, and Sthapatyaveda).**
- **Ayurveda** is an alternative medicine system with historical roots in the Indian subcontinent.
  - The theory and practice of Ayurveda are pseudoscientific.
  - The Indian Medical Association describes Ayurvedic practitioners who claim to practice medicine as quacks.[6] Ayurveda is heavily practiced in India and Nepal, where around **80%** of the population report using it.
- **Shilpaveda** is considered as the Upaveda instead of Arthashastra according to Charanavyuha and Katyayana.
  - The Upavedas supplement the Vedas with more specific applications of Vedic teachings into the cultural field.
  - Upavedas are considered as a part of Veda and not as a separate entity according to a few scholars, in such case there are Chaturdhasha Vidyasthanas only.

---

56. Answer: a

Explanation:

Given

27 and 81

Concept

To find the H.C.F and L.C.M of the numbers, first take factors of the numbers.

Calculation

Factors of 27 = 3 × 3 × 3

Factors of 81 = 3 × 3 × 3 × 3

L.C.M of 27 and 81 = 3 × 3 × 3 × 3

⇒ 81

H.C.F of 27 and 81 = 3 × 3 × 3

⇒ 27

∴ T he LCM and HCF of 27 and 81 is 81 and 27.

---

57. Answer: b

Explanation:

Given

Cost price of 10 toffees = Re. 1

Gain = 25%

Concept

Selling price = cost price + profit

Calculation

cost price of 10 toffee = Re. 1

cost price of 1 toffee = Re. 1/10

Selling price x toffee = Re.1

selling price of 1 toffee = 1/x

(1/x) = (1/10) + 25% of (1/10)

⇒ (1/x) = (1/10) + (25/1000)

⇒ (1/x) = (1/10) + (1/40)

⇒ (1/x) = (4 + 1)/40

⇒ (1/x) = (5/40)

⇒ x = 40/5

⇒ x = 8

∴ **Vendor should sell 8 toffees for Re1 to gain 25%.**

---

58. Answer: c

Explanation:

The correct answer is2010.

⭐ Key Points

- In 2010 the new currency symbol of the Indian rupee was officially adopted.
- The **symbol of the Indian Rupee typifies India's international identity for money transactions and economic strength.**
  - The **Indian Rupee sign** is an allegory of Indian ethos.
  - The symbol is an amalgam of **Devanagari "Ra" and the Roman Capital "R"** with two parallel horizontal stripes running at the top representing the national flag and also the "equal to" sign. The Indian Rupee sign was adopted by the Government of India on 15th July 2010.
  - The symbol, conceptualized and designed by Udaya Kumar, a postgraduate in Design from the Indian Institute of Technology Bombay, has been chosen from thousands of concept entries received by the

Ministry of Finance through an open competition among resident Indian nationals.
    - The process of establishing and implementing this new identity is underway through various digital technology and computer applications.

⭐ **Additional Information**

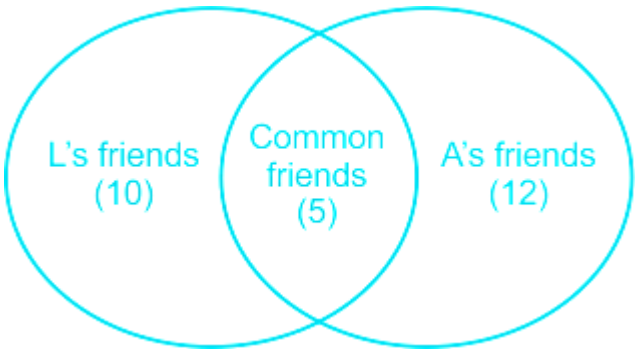
- On 5 March 2009, the Indian government announced a contest to create a sign for the Indian rupee.
    - During the 2010 Union Budget, then Union Finance Minister Pranab Mukherjee said that the proposed sign should reflect and capture the Indian ethos and culture.
    - From around **3,331 responses received, five symbols were shortlisted** .
    - These were the entries from Nondita Correa-Mehrotra, Hitesh Padmashali, Shibin KK, Shahrukh J. Irani, and D. Udaya Kumar:
    - one of them was due to be selected at the Union Council of Ministers of India meeting held on 24 June 2010.
    - However, the decision was deferred at the request of the Finance Minister, and the final decision was made when they met again on 15 July 2010, when they chose the symbol created by Udaya Kumar, Associate Professor IIT Guwahati.

---

59. Answer: b

Explanation:

The given information can be represented by a Venn diagram as follows:



- Total students in class = 30
- Total friends of L and A = 10 + 5 + 12 = 27
- Number of students who are friends with neither L nor A = 30 - 27 = 3

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

---

60. Answer: b

Explanation:

The correct answer is **Champaran Satyagraha**.

⭐ **Key Points**

- **Champaran Satyagraha was inspired by Mahatma Gandhi against the forced cultivation of indigo**.
- The **Champaran Satyagraha of 1917** was the first Satyagraha movement led by Mahatma Gandhi in British India and is considered a historically important rebellion in the Indian independence movement.
  - It was a farmer's uprising that took place in the **Champaran district of Bihar in the Indian subcontinent, during the British colonial period.**
  - The farmers were protesting against having to grow indigo with barely any payment for it.
  - When Gandhi returned to India from South Africa in **1915** and saw peasants in Northern India oppressed by Indigo planters, he tried to use the same methods that he had used in South Africa to organize mass uprisings by people to protest against injustice.
  - Champaran Satyagraha was the first popular satyagraha movement.

⭐ **Additional Information**

- **Munda Rebellion** is one of the prominent 19th century tribal rebellions in the subcontinent.
  - Birsa Munda led this movement in the region south of Ranchi in 1899-1900.

    - The Mundas traditionally enjoyed a preferential rent rate as the khuntkattidar or the original clearer of the forest.
    - But in course of the 19th century, they had seen this khuntkatti land system being eroded by the jagirdars and thikadars coming as merchants and moneylenders.
- The **non-cooperation movement** was a political campaign launched in 1920, by Mahatma Gandhi to have Indians revoke their cooperation from the British government, with the aim of inducing the British to grant self-governance.
- The **Salt March** , also known as the Salt Satyagraha, Dandi March, and the Dandi Satyagraha, was an act of nonviolent civil disobedience in colonial India led by Mahatma Gandhi.
    - The **twenty-four-day march lasted from 12 March 1930 to 6 April 1930** as a direct action campaign of tax resistance and nonviolent protest against the British salt monopoly.
    - Another reason for this march was that the **Civil Disobedience Movement** needed a strong inauguration that would inspire more people to follow Gandhi's example.

---

61. **Answer: d**

Explanation:

The correct answer is **Shashi Tharoor**.

⭐ **Key Points**

- **The book, 'Why I am Hindu' was written by Shashi Tharoor**.
- **Why I Am a Hindu is a 2018** book by **Indian politician Shashi Tharoor.**
- In the book, he wrote about the history of Hinduism and its core tenets, as well as socio-cultural developments in India that relate to the religion, while elucidating his own religious convictions.
- **Shashi Tharoor** is an Indian former international diplomat, politician, writer, and public intellectual who has been serving as Member of Parliament, Lok Sabha from Thiruvananthapuram, Kerala, since 2009.

- He was formerly **Under-Secretary-General of the United Nations and ran for the post of Secretary-General in 2006** .
- He also serves as **Chairman of the Parliamentary Standing Committee on Information Technology and All India Professionals Congress** .
- He formerly served as Chairman of the Parliamentary Standing Committee on External Affairs (2014 to 2019).
- In 2019, Shashi Tharoor received the **Sahitya Academy Award** for his book An Era of Darkness in a non-fiction category in the English language.

⭐ **Additional Information**

- **Manmohan Singh** is an Indian economist, academic, and politician who served as the 13th Prime Minister of India from 2004 to 2014.
  - He is also the longest-serving Prime Minister after Jawaharlal Nehru and Indira Gandhi.
  - **Books** : Prime Minister Manmohan Singh: June 2005 to May 2006, India's Export Trends & Prospects for Self-Sustained Growth in 1964.
- **Atal Bihari Vajpayee** was an Indian politician 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.
  - Vajpayee was one of the co-founders and a senior leader of the Bharatiya Janata Party.
  - **Books** : National Integration - 1961, India's Foreign Policy: New Dimensions - 1977, Dynamics of an Open Society - 1977, Assam Problem: Repression no Solution - 1981, Atal Bihari Vaj Mem Tina Dasaka - 1992, Kucha Lekha, Kucha Bhashana - 1996
- **Narendra Damodardas Modi** is an Indian politician serving as the **14th and current prime minister of India since 2014** .
  - He was the **chief minister of Gujarat from 2001 to 2014 and is a Member of Parliament from Varanasi.**
  - **Sakshi Bhaav's book** literally means **'the witness state' which is a collection of poems.**
    - **It was originally a diary written by PM Modi Ji when he was 36.**
    - These poems are free-flowing his dialogues with the mother goddess.

62. **Answer: a**

Explanation:

The correct answer is **Womesh Chandra Banerjee**.

⭐ **Key Points**

- **Womesh Chandra Banerjee was the first president of the Indian National Congress**.
- **Womesh Chandra Bannerjee** (or Umesh Chandra Banerjee by current English orthography of Bengali names) (29 December 1844 – 21 July 1906) was an Indian barrister.
    - He was the **co-founder and first president** of the Indian National Congress.
    - Born in **1844** at Calcutta he studied at the Oriental Seminary and the Hindu School.
    - His career began in 1862 when he joined the firm of W. P. Gillanders, attorneys of the Calcutta Supreme Court, as a clerk where he acquired a knowledge of the law.
    - In **1864** he was sent to England where he joined the Middle Temple and was called to the Bar in June 1867.
    - He presided over the first session of the Indian National Congress held at Bombay in 1885 from 28 to 31 December.
    - He was the president of the Indian National Congress again in the **1892** session in Allahabad where he denounced the position that India had to prove for the worthiness of political freedom.

⭐ **Additional Information**

- **Annie Besant** was a British socialist, theosophist, women's rights activist, writer, orator, educationist, and philanthropist.
    - Regarded as a champion of human freedom, she was an ardent supporter of both Irish and Indian self-rule.
    - She was the **first Non-Indian Women President of the Indian National Congress.**

- **Jivatram Bhagwandas Kripalani**, popularly known as Acharya Kripalani, was an Indian politician, noted particularly for holding the presidency of the Indian National Congress during the transfer of power in 1947 and the husband of Sucheta Kripalani.
- **Jawaharlal Nehru** was an Indian anti-colonial nationalist, secular humanist, social democrat, and author who was a central figure in India during the middle of the 20th century.
    - Nehru was a principal leader of the Indian nationalist movement in the 1930s and 1940s.
    - He wrote the famous book **"The Discovery of India".**

---

63. **Answer: c**

Explanation:

Given

Vikas completes a job = 15 days

Bablu completes a job = 10 days

Concept

first find the total work and then the efficiency of each person.

work = efficiency × time

Calculation

let the total work is 30 units.

L.C.M of 15 and 10

Vikas complete work in one day = 30/15

⇒ 2 units

Bablu complete work in 1 day = 30/10

⇒ 3 units

Vikas and Bablu complete work in 1 day = 2 + 3

⇒ 5 units

Total days taken by Vikas abd Bablu to complete a work = 30/5

⇒ 6 days.

∴ They complete the job in 6 days if work together.

---

64. Answer: b

Explanation:

The correct answer is **41st Native Infantry**.

⭐ **Key Points**

- **41st Native Infantry battalion was involved in the killing of all its white officers in the Revolt of 1857**.
  - **On 29 March 1857** at **Barrackpore, Sepoy Mangal Pandey** of the **34th Bengal Native Infantry attacked his officers** .
  - When his comrades were ordered to restrain him they refused, but they stopped short of joining him in open revolt.
  - Although only a handful of sepoys had been involved, the entire regiment was disbanded in disgrace.
  - Sepoys elsewhere thought this too harsh a punishment.
  - The Mutiny proper began at Meerut on **10 May 1857** .
  - Eighty-five members of the **3rd Bengal Light Cavalry** , who had been jailed for refusing to use cartridges they believed to be at odds with their religion, were broken out of prison by their comrades.

- They ransacked the nearby military station and killed any Europeans they could find.

⭐ **Additional Information**

- The immediate cause of the Sepoy Mutiny of 1857 was the introduction of greased cartridges that were supplied to the soldiers for the New Enfield Rifles.
  - A rumour spread that the cartridges of the new enfield rifles were greased with the fat of cows and pigs.
  - Before loading these rifles the sepoys had to bite off the paper on the cartridges. Both Hindu and Muslim sepoys refused to use them.
  - The political causes of the revolt were the British policy of expansion through the Doctrine of Lapse and direct annexation.
  - The abolition of practices like sati and female infanticide, and the legislation legalizing widow remarriage, was believed as threats to the established social structure.
  - Introducing western methods of education was directly challenging the orthodoxy for Hindus as well as Muslims.
  - After the Industrial Revolution in England, there was an influx of British manufactured goods into India , which ruined industries, particularly the textile industry of India.

---

65. **Answer: c**

Explanation:

Given

15 – (6 + 6 × 6) ÷ (2 + 5)

Concept

BODMAS

B	Brackets, [,{,(
O	'OF'
D	Division, ÷
M	Multiply, \times
A	Addition, +
S	Subtraction, -

Calculation

$15 - (6 + 6 \times 6) \div (2 + 5)$

$\Rightarrow 15 - (6 + 36) \times (1/7)$

$\Rightarrow 15 - 42 \times (1/7)$

$\Rightarrow 15 - 6$

$\Rightarrow 9$

$\therefore$ The value of $15 - (6 + 6 \times 6) \div (2 + 5)$ is 9

---

66. Answer: d

Explanation:

Given

$x + y = 5$ and $xy = 6$

Formula used

$(x + y)^3 = x^3 + y^3 + 3xy(x + y)$

Calculation

$x + y = 5$

cube on both sides

$(x + y)^3 = (5)^3$

$\Rightarrow x^3 + y^3 + 3xy(x + y) = 125$

$\Rightarrow x^3 + y^3 + 3 \times 6 \times 5 = 125$

$\Rightarrow x^3 + y^3 + 90 = 125$

$\Rightarrow x^3 + y^3 = 125 - 90$

$\Rightarrow x^3 + y^3 = 35$

$\therefore$ The value of $x^3 + y^3$ is 35.

---

67. **Answer: c**

Explanation:

The correct answer is Gulzarilal Nanda.

⭐ Key Points

- Gulzarilal Nanda was the first and only acting PM of India.
  - **Gulzarilal Nanda BR** was an Indian politician and economist who specialized in labor issues.
  - He was the **Interim Prime Minister of India** for **twice 13-day stints** following the deaths of **Jawaharlal Nehru in 1964 and Lal Bahadur Shastri in 1966 respectively.**
  - Both his terms ended after the ruling **Indian National Congress's parliamentary party elected a new prime minister.**
  - He was awarded the **Bharat Ratna, India's highest civilian award, in 1997** .

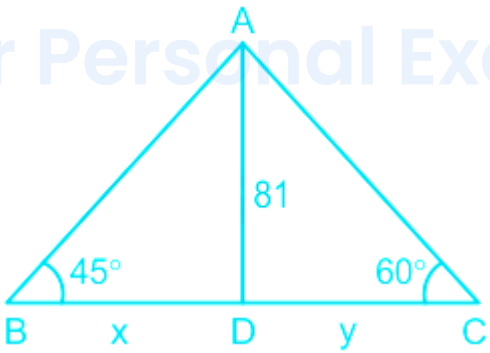
⭐ Additional Information

- **Haradanahalli Doddegowda Deve Gowda** is an Indian politician from the state of Karnataka.
    - He served as the 11th prime minister of India from 1 June 1996 to 21 April 1997.
    - He was previously the 14th Chief Minister of Karnataka from 1994 to 1996.
- **Vishwanath Pratap Singh** , shortened to V. P. Singh, was an Indian politician who was the 7th Prime Minister of India from 1989 to 1990 and the 41st Raja Bahadur of Manda.
    - He is India's only prime minister to have been former royalty.
    - He was educated at Allahabad University and Pune University.
- **Inder Kumar Gujral** was an Indian diplomat, politician, and freedom activist who served as the 12th prime minister of India from April 1997 to March 1998.
    - Born in Punjab, he was influenced by nationalistic ideas as a student and joined the All India Students Federation and the Communist Party of India.

---

68. **Answer: b**

Explanation:



Given

Height of lighthouse = 81 m

Angle of elevation = 45° and 60°

Formula used

tan A = side opposite to A/side adjacent to A

tan 45° = 1

tan 60° = √3

Calculation

let AD is the lighthouse which is 81 m high. ∠B = 45° and ∠C = 60°

distance between two ships are (x + y)

In triangle ABD

tan 45° = AD/BD

⇒ 1 = 81/x

⇒ x = 81

tan 60° = 81/y

⇒ √3 = 81/y

⇒ y = 81√ 3

x + y = 81 + (81/√3)

⇒ x + y = (81√ 3 + 81)/(√ 3)

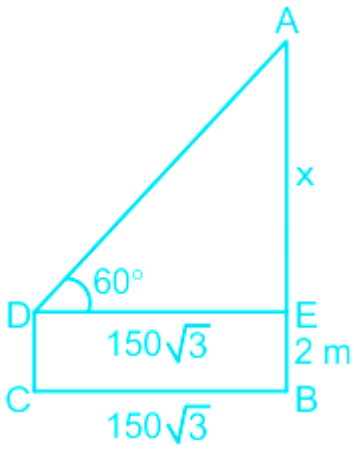
⇒ x + y = 81(√3 + 1)/√ 3

∴ Distance between two ships are 81[(√3 +1)]/√3.

---

69. **Answer: c**

Explanation:



Given

Height of observer = 2 m

Distance between observer and tower = 150√3 m

Angle of elevation from the eye of an observer = 60°

Concept

tan A = Side opposite of A/Side adjacent to A

tan 60° = √ 3

Calculation

Let the DC is the height of the observer which is 2 m. AB is the height of the tower. ∠D is the angle of elevation from the eye of the observer towards the top of the tower. BC is the distance between the tower and observer which is 150√3.

In triangle AED

tan 60° = AE/DE

⇒ √3 = x/(150√ 3)

⇒ √3 × 150√3 = x

⇒ 150 × 3 = x

⇒ 450 = x

AB = AE + EB

⇒ AB = 450 + 2

⇒ AB = 452

∴ The height of the tower is 452 m

---

70. Answer: a

Explanation:

The correct answer is Haemoglobin.

⭐ Key Points

- Hemoglobin is a pigment present in human blood that carries oxygen from our lungs to all parts of the body.
- **RBCs contain hemoglobin** a**protein that carries oxygen.**
- **Blood** gets its bright **red color when hemoglobin picks up oxygen in the lungs** .
- As the **blood travels through the body, the hemoglobin releases oxygen to the different body parts.**
- Each **RBC lives** for about **4 months** .
- **Hemoglobin** in the blood carries oxygen from the respiratory organs (e.g. lungs or gills) to the rest of the body (i.e. tissues).
    - There it releases the oxygen to permit aerobic respiration to provide energy to power functions of an organism in the process called metabolism.
    - A healthy individual human has **12 to 20 grams** of hemoglobin in every 100 mL of blood.
    - In mammals, the chromoprotein makes up about **96% of the red blood cell's** dry content (by weight), and around 35% of the total content (including water).

- Hemoglobin has an oxygen-binding capacity of **1.34 mL O2 per gram**, which increases the total blood oxygen capacity seventy-fold compared to dissolved oxygen in the blood.

⭐ Additional Information

- **White blood cells** are part of the body's immune system.
  - They help the body **fight infection and other diseases**.
  - Types of white blood cells are granulocytes (neutrophils, eosinophils, and basophils), monocytes, and lymphocytes (T cells and B cells).
- A **platelet count** is a lab test to measure how many platelets you have in your blood.
  - Platelets are parts of the blood that **help the blood clot.**
  - They are smaller than red or white blood cells.
  - A platelet count is a lab test to measure how many platelets you have in your blood.
  - Platelets are parts of the blood that help the blood clot.
  - They are smaller than red or white blood cells.
- **Lymph** is the fluid that flows through the lymphatic system, a system composed of lymph vessels and intervening lymph nodes whose function, as the venous system, is to return fluid from the tissues to the central circulation.

---

71. Answer: a

Explanation:

The correct answer is **1853**.

⭐ Key Points

- **In 1853 the Railway was introduced by the British in India for passengers**.
- The history of Indian Railways dates back to over 160 years ago.
  - **On 16th April 1853,** the first passenger train ran between **Bori Bunder (Bombay) and Thane, a distance of 34 km**.

- It was operated by three locomotives, named **Sahib, Sultan, and Sindh, and had thirteen carriages.**

⭐ **Additional Information**

- On **8 May 1845** , the Madras Railway was incorporated, followed that year by the East India Railway.
- On **1 August 1849,** the Great Indian Peninsular Railway was incorporated by an act of parliament.
- The "guarantee system", providing free land and a guaranteed five-percent rate of return to private British companies willing to build railways was finalized on 17 August 1849. In 1851, the Solani Aqueduct Railway was built in Roorkee.
- It was hauled by the Thomason steam locomotive, named after a British officer-in-charge of that name.
- The railway transported construction materials for an aqueduct over the Solani River.
- In **1852** , the Madras Guaranteed Railway Company was incorporated.

---

72. Answer: b

Explanation:

The correct answer is **Wikipedia**.

⭐ **Key Points**

- **Wikipedia is NOT a web browser**.
- **Wikipedia** is a free online encyclopedia, created and edited by volunteers around the world and hosted by the Wikimedia Foundation.
- A **web browser** (also referred to as an Internet browser or simply a browser) is application software for accessing the World Wide Web or a local website.
  - When a user requests a web page from a particular website, the web browser retrieves the necessary content from a web server and then displays the page on the user's device.

- A web browser is not the same thing as a search engine, though the two are often confused.
- A search engine is a website that provides links to other websites. However, to connect to a website's server and display its web pages, a user must have a web browser installed.
- Web browsers are used on a range of devices, including desktops, laptops, tablets, and smartphones.
- In 2020, an estimated 4.9 billion people used a browser.
- The most used browser is Google Chrome, with a 63% global market share on all devices, followed by Safari with 20%.

⭐ Additional Information

- **Opera** is a multi-platform web browser developed by its namesake company Opera. Opera is a Chromium-based browser.
  - It distinguishes itself from other browsers through its user interface and other features.
- **Google Chrome** is a cross-platform web browser developed by Google.
  - It was first released in 2008 for Microsoft Windows, built with free software components from Apple WebKit and Mozilla Firefox.
  - It was later ported to Linux, macOS, iOS, and Android, where it is the default browser.
- **Mozilla Firefox** , or simply Firefox, is a free and open-source web browser developed by the Mozilla Foundation and its subsidiary, the Mozilla Corporation.
  - Firefox uses the Gecko rendering engine to display web pages, which implements current and anticipated web standards.

---

73. Answer: b

Explanation:

The correct answer is 1765.

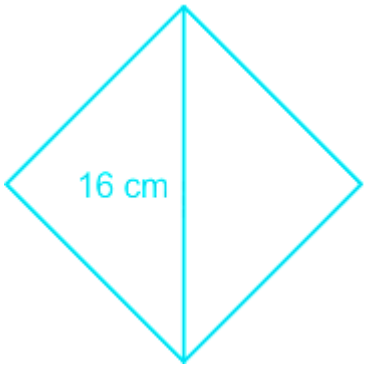
⭐ Key Points

- In 1765 did the East India Company acquire 'Diwani' rights over Bengal and Bihar.
- The **Mughal Emperor Shah Alam II** granted the Diwani of Bengal, Bihar, and Orissa to the East India Company in 1765.
- The **Treaty of Allahabad was signed on 16 August 1765, between the Mughal Emperor Shah Alam II, son of the late Emperor Alamgir II, and Robert Clive, of the East India Company, in the aftermath of the Battle of Buxar of 23 October 1764.**
    - The treaty was handwritten by I'tisam-ud-Din, a Bengali Muslim scribe and diplomat to the Mughal Empire.
    - The Treaty marked the political and constitutional involvement and the beginning of British rule in India.
    - Based on the terms of the agreement, Alam granted the East India Company Diwani rights, or the right to collect taxes on behalf of the Emperor from the eastern province of Bengal-Bihar-Orissa.
    - These rights allowed the company to collect revenue directly from the people of **Bengal, Bihar, and Orissa** .
    - In return, the Company paid an annual tribute of twenty-six lakhs of rupees (equal to 260,000 pounds sterling) while securing for Shah Alam II the districts of Kada and Allahabad.
    - The tribute money paid to the emperor was for the maintenance of the Emperor's court in Allahabad.

---

74. **Answer: c**

Explanation:



Given

Perimeter of rhombus = 68 cm

One of the diagonal of rhombus = 16 cm

Formula used

Perimeter of rhombus = $2\sqrt{(\text{diagonal}_1)^2 + (\text{diagonal}_2)^2}$

Calculation

$68 = 2\sqrt{(16)^2 + (\text{diagonal}_2)^2}$

$\Rightarrow 34 = \sqrt{256 + (\text{diagonal}_2)^2}$

squaring on both sides

$\Rightarrow 1156 = 256 + (\text{diagonal}_2)^2$

$\Rightarrow 1156 - 256 = (\text{diagonal}_2)^2$

$\Rightarrow 900 = (\text{diagonal } 2)^2$

$\Rightarrow 30 = \text{Diagonal}_2$

Area of rhombus = $(1/2) \times$ diagonal 1 $\times$ diagonal 2

$\Rightarrow (1/2) \times 16 \times 30$

$\Rightarrow 16 \times 15$

$\Rightarrow$ 240 sq cm

∴ Area of rhombus is 240 sq cm.

---

75. **Answer: c**

Explanation:

The correct answer is South Africa.

⭐ Key Points

- The famous 'Zulu' tribe belongs to South Africa.
- **Zulu people** are a Nguni ethnic group in Southern Africa.
  - The **Zulu people** are the largest ethnic group and nation in **South Africa** with an estimated **10–12 million people living mainly in the province of KwaZulu-Natal.**
  - They originated from **Nguni communities** that took part in the **Bantu migrations over millennia.**
  - As the clans integrated together, the rulership of Shaka brought success to the Zulu nation due to his improved military tactics and organization.
  - Zulus take pride in their ceremonies such as the Umhlanga, or Reed Dance, and their various forms of beadwork.
  - The art and skill of beadwork take part in the identification of Zulu people and act as a form of communication.
  - Today the Zulu people predominantly believe in Christianity but have created a syncretic religion that is combined with the Zulu's prior belief systems.

⭐ Additional Information

State	Tribes
Arunachal Pradesh	Singpho, Monpa, Abor, Sherdukpen, Galo, Apatanis
Chhattisgarh	Nagasia, Biar, Khond, Agariya, Bhattra, Mawasi, Bhaina
Madhya Pradesh	Kharia, Bhils, Murias, Birhors, Baigas, Katkari, Kol, Bharia, Khond, Gonds
Rajasthan	Bhils, Damaria, Dhanka, Meenas(Minas), Patelia, Sahariya

---

76. Answer: a

Explanation:

Given

$4 \times 5 \div 2 - 8 \times 7 + 9 - (3 + 2)$

Concept

BODMAS

B	Bracket [,{,(
O	'OF'
D	Division, ÷
M	Multiply, ×
A	Addition, +
S	Subtraction. -

Calculation

$4 \times 5 \div 2 - 8 \times 7 + 9 - (3 + 2)$

$\Rightarrow 4 \times 5 \times (1/2) - 56 + 9 - 5$

$\Rightarrow 10 - 56 + 4$

$\Rightarrow -46 + 4$

$\Rightarrow -42$

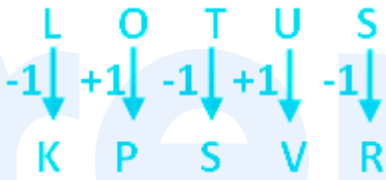
$\therefore$ The value of $4 \times 5 \div 2 - 8 \times 7 + 9 - (3 + 2)$ is - 42.

77. **Answer: c**

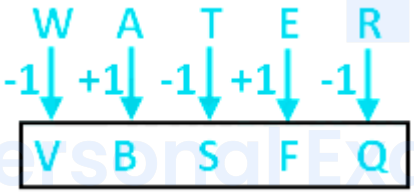
Explanation:

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 logic followed here is:-



Similarly,

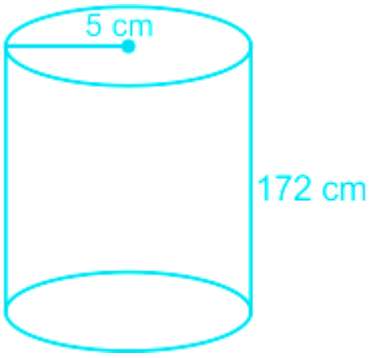


Hence, '**option 3**' is the correct answer.

---

78. **Answer: a**

Explanation:



Given

Radius of cylinder, r = 5 cm

Height of cylinder, h = 172 cm

Formula used

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

where r and h are radius and height of cylinder

Calculation

Volume of cylinder = π × 5 × 5 × 172

⇒ 4300 πcm^3

∴ Volume of cylinder is 4300 πcm^3

---

79. Answer: a

Explanation:

The correct answer is**Article 368**.

⭐ **Key Points**

- **Article 368 (1)** of the Constitution of India grants constituent power to make formal amendments and empowers Parliament to amend the Constitution by

way of addition, variation, or repeal of any provision according to the procedure laid down therein, which is different from the procedure for ordinary legislation.

- **'Article 368'** has been amended by the **24th and 42nd Amendments in 1971 and 1976 respectively.**
- The following is the full text of Article 368 of the Constitution, which governs constitutional amendments.
- New clauses **368 (1) and 368 (3)** were added by the **24th Amendment in 1971**, which also added a new clause **(4) in article 13** which reads, "Nothing in this article shall apply to any amendment of this Constitution made under article 368."
- The provisions in italics were inserted by the **42nd Amendment** but were later declared unconstitutional by **the Supreme Court in Minerva Mills v. Union of India in 1980.**

⭐ Additional Information

- Under **Article 356** of the Constitution of India, if a state government is unable to function according to Constitutional provisions, the Union government can take direct control of the state machinery.
- **Article 144** of the Indian Constitution advises civil and judicial authorities to act in aid of the Supreme Court. It says that all authorities, civil and judicial, in the territory of India shall act in aid of the Supreme Court.
- **Article. 198** . Special procedure in respect of Money Bills. - (1) A Money Bill shall not be introduced in a Legislative Council.

---

80. Answer: a

Explanation:

The correct answer is 12th April 2005.

⭐ Key Points

- The **National Rural Health Mission (NRHM)** was launched by the Hon'ble Prime Minister on12th April 2005, to provide accessible, affordable and quality health

care to the rural population, especially the vulnerable groups.

- The **Union Cabinet vide its decision dated 1st May 2013** , has approved the launch of the **National Urban Health Mission (NUHM) as a Sub-mission** of an over-arching **National Health Mission (NHM)** , with the **National Rural Health Mission (NRHM)** being the other **Sub-mission of National Health Mission** .

⭐ Additional Information

- **NRHM** seeks to provide equitable, affordable, and quality health care to the rural population, especially the vulnerable groups. Under the NRHM, the Empowered Action Group (EAG) States, as well as the North Eastern States, Jammu, Kashmir, and Himachal Pradesh, have been given special focus.
    - The thrust of the mission is on establishing a fully functional, community-owned, decentralized health delivery system with inter-sectoral convergence at all levels, to ensure simultaneous action on a wide range of determinants of health such as water, sanitation, education, nutrition, social and gender equality.
    - Institutional integration within the fragmented health sector was expected to provide a focus on outcomes, measured against Indian Public Health Standards for all health facilities.

---

81. Answer: d

Explanation:

The correct answer is **Pratyush**.

⭐ Key Points

- **Pratyush is India's first multi-petaflop supercomputer that has been set up at the Indian Institute of Tropical Meteorology (IITM), Pune.**
- **Developed at a cost of Rs. 450 crore, the supercomputer is used for weather and climate predictions**.
- **Pratyush** and **Mihir** are the supercomputers established at the **Indian Institute of Tropical Meteorology (IITM), Pune** , and **National Centre for Medium-Range**

Weather Forecast (NCMRWF), Noida respectively.

- **As of January 2018, Pratyush and Mihir** are the **fastest supercomputers in India** with a **maximum speed of 6.8 PetaFlops at a total cost of INR 438.9 Crore.**
- The system was inaugurated by **Dr. Harsh Vardhan, Union Minister for science and technology, on 8 January 2018.**
- The word **'Pratyush'** defines the **rising sun.**

⭐ Additional Information

- **Being a High-Performance Computing (HPC)** facility, Pratyush, and Mihir consist of several computers that can deliver a peak power of 6.8 PetaFlops.
  - **It is the first multi-PetaFlops supercomputer ever built in India** .
  - Pratyush and Mihir are two High-Performance Computing (HPC) units.
  - They are located at two government institutes, one being 4.0 PetaFlops unit at IITM, Pune, and another 2.8 PetaFlops unit at the National Centre for Medium-Range Weather Forecasting (NCMRWF), Noida.
  - They provide a combined output of 6.8 PetaFlops.

---

82. Answer: a

Explanation:

The correct answer is **Nick Vujicic**.

⭐ Key Points

- **Nick Vujicic is a Serbian Australian motivational speaker born with tetra-amelia syndrome, a rare disorder characterized by the absence of all four limbs**.
- **Nicholas James Vujicic** is an Australian American Christian evangelist and motivational speaker born with tetra-amelia syndrome, a rare disorder characterized by the absence of arms and legs.
- Vujicic was born in Melbourne, Australia, in 1982 to Dusanka and Borislav Vujicic, Serbian immigrants from Yugoslavia.
  - He was born without fully formed limbs.

    - According to his autobiography, his mother refused to see him or hold him when the nurse held him in front of her, and she and her husband went out of the hospital.
- Originally, the toes of one of his feet were fused. An operation was performed to separate the toes so that he could use them as fingers to grab.
- He refers to it as his **chicken drumstick** .

⭐ Additional Information

- **Lisa Nichols** is a celebrated motivational speaker who has inspired millions through her seminars and her role as a featured teacher in The Secret.
    - She is the founder of Motivating the Masses and CEO of Motivating the Teen Spirit, LLC.
- **David Lawrence Ramsey III** is an American personal finance personality, radio show host, author, and businessman.
    - An evangelical Christian, he hosts the nationally syndicated radio program The Ramsey Show.
- **Anthony Jay Robbins** is an American author, coach, speaker, and philanthropist.
    - He is known for his infomercials, seminars, and self-help books including the books Unlimited Power and Awaken the Giant Within.

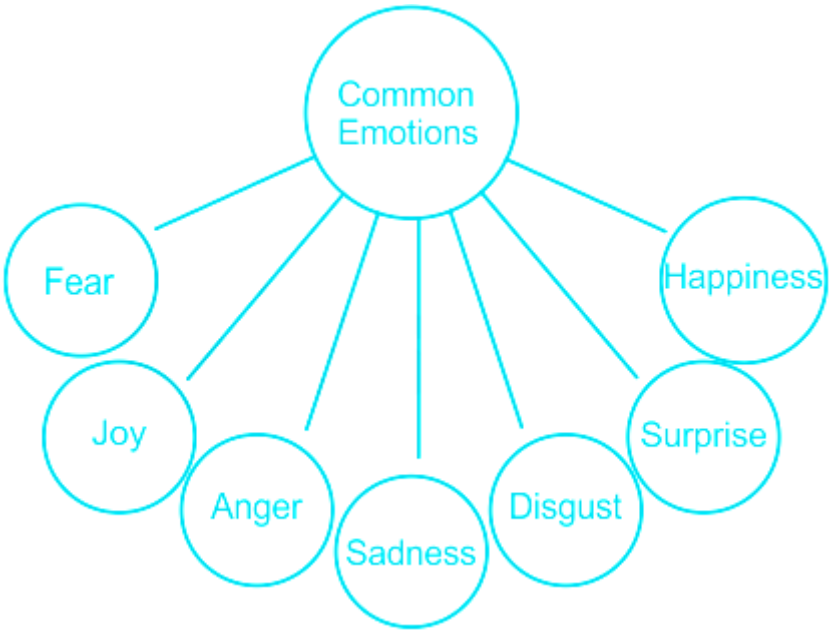
---

83. Answer: d

Explanation:

The logic here is-

- Fear, happiness and anger are different types of emotions or feelings that are expressed by an individual.
- Whereas, intelligence is an ability of an individual to acquire and apply knowledge.



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

---

84. Answer: d

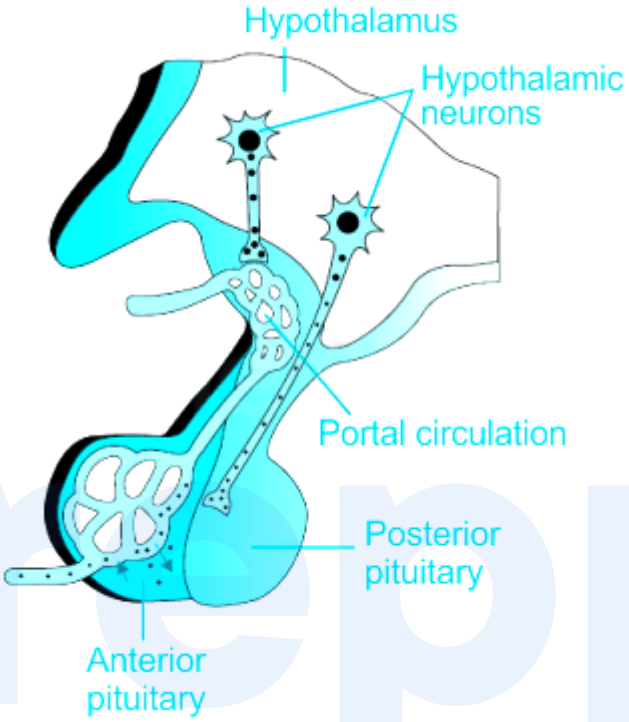
Explanation:

The correct answer is **pituitary**.

⭐ **Key Points**

- **The pituitary gland, which hangs by a thin stalk from the hypothalamus, is called the master gland of the human body**.
- The **pituitary gland** is a small gland that sits in the sella turcica ('Turkish saddle'), a bony hollow in the base of the skull, underneath the brain, and behind the bridge of the nose.
    - The pituitary gland is called the 'master gland' as the hormones it produces control so many different processes in the body.
    - It senses the body's needs and sends signals to different organs and glands throughout the body to regulate their function and maintain an appropriate environment.

- It secretes a variety of hormones into the bloodstream which acts as messengers to transmit information from the pituitary gland to distant cells, regulating their activity.



⭐ Additional Information

- The **pancreas** is an organ located in the abdomen.
  - It plays an essential role in converting the food we eat into fuel for the body's cells.
  - The pancreas has two main functions: an exocrine function that helps in digestion and an endocrine function that regulates blood sugar.
- The **thyroid**, or thyroid gland, is an endocrine gland in vertebrates.
  - In humans, it is in the neck and consists of two connected lobes.
  - The lower two-thirds of the lobes are connected by a thin band of tissue called the thyroid isthmus.
  - The thyroid is located at the front of the neck, below Adam's apple.
- A small gland that makes steroid hormones, adrenaline, and noradrenaline. These hormones help control heart rate, blood pressure, and other important body functions.
- There are two **adrenal glands**, one on top of each kidney.

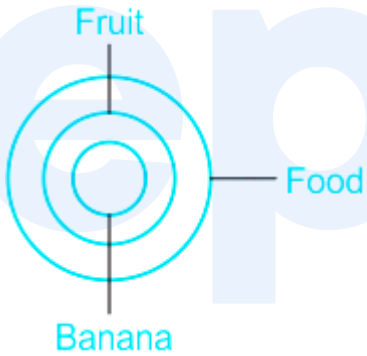
- Also called suprarenal gland.

---

85. Answer: a

Explanation:

- Banana, food, and fruit are inter-related as fruits are a type of food item and banana is a type of fruit.
- So, banana falls into the category of fruits and fruits come under the category of food items.
- Thus, the best Venn diagram representation is as follows:-



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

---

86. Answer: c

Explanation:

Average sale from January to July = (200 + 300 + 100 + 200 + 400 + 500 + 600)/7

2300/7

328

February sales was 300.

∴ The sales nearest to the average sales for the period January to July in the month of February.

---

87. **Answer: d**

Explanation:

January sales is 200 units

while July sales is 600 units.

∴ July sales was three times the sales in January.

---

88. **Answer: a**

Explanation:

Average sale from January to March = (200 + 300 + 100)/3

⇒ 600/3

⇒ 200

Average sales from April to June = (200 + 400 + 500)/3

⇒ 1100/3

⇒ 366.66 or 366

Required percentage = [(366 - 200)/200] × 100

⇒ (166/200)× 100

⇒ 83%

∴ The approximate percentage increase in average sales between the period January to March and the period April to June is 83%

---

89. **Answer: b**

Explanation:

In February = [(300 - 200)/200] × 100

⇒ (100/200) × 100

⇒ 50%

In April = [(200 - 100)/100] × 100

⇒ (100/100) × 100

⇒ 100%

In May = [(400 - 200)/200] × 100

⇒ (200/200) × 100

⇒ 100%

In June = [(500 - 400)/400]× 100

⇒ (100/400) × 100

⇒ 25%

In July = [(600 - 500)/500] × 100

⇒ (100/500) × 100

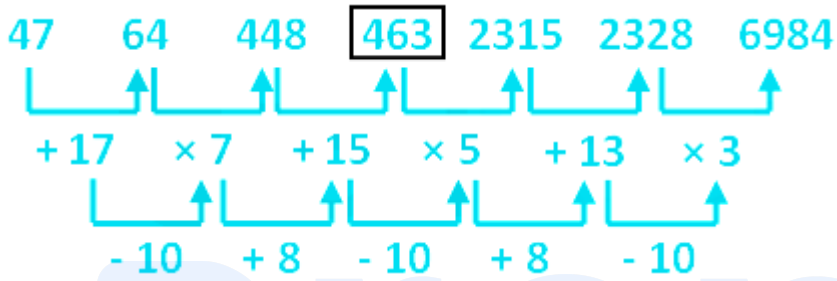
⇒ 20%

∴ In May month was the percentage sales compared to the previous month, the highest.

90. **Answer: c**

Explanation:

The logic followed here is :-



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

91. **Answer: b**

Explanation:

The logic followed here is:-

- Here, $4^3 = 64, 5^3 = 125, 6^3 = 216, 7^3 = 343$

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

92. **Answer: b**

Explanation:

The statement tells that invigilators are refrained from using mobile phones during exams.

- It can be assumed that it is so because mobiles can distract or disturb students who are trying to concentrate during exams. Thus, assumption I is implicit.
- If the invigilator is using a mobile, they might be unable to be vigilant for that moment. Thus, it is true that keeping the mobile off will improve their vigilance. Thus, assumption II is also implicit.

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

---

93. Answer: d

Explanation:

The logic followed here is:-

- Sum of digits of LHS = RHS

1. $7\ 4\ 9\ 3 = 7 + 4 + 9 + 3 = 23$

2. $8\ 4\ 3\ 7 = 8 + 4 + 3 + 7 = 22$

3. $6\ 5\ 8\ 9 = 6 + 5 + 8 + 9 = 28$

4. $5\ 4\ 2\ 5 = 5 + 4 + 2 + 5 = 16 \neq 51$

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

---

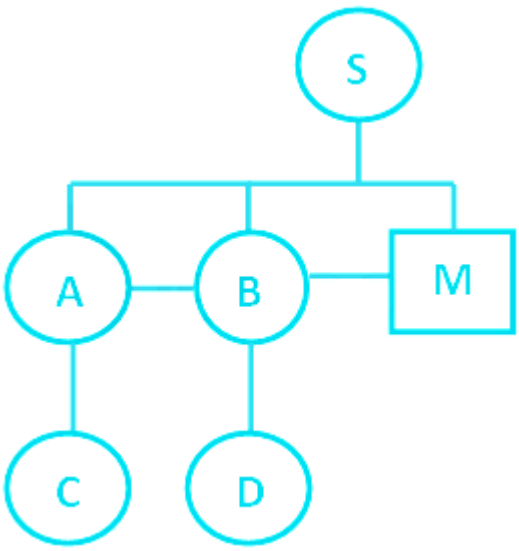
94. Answer: c

Explanation:

- Preparing the family tree using the following symbols:

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

- Based on the information given in the question, the family tree will be as follows:



 Let C and D be the girls whose maternal uncle is M.

 Let A and B be the mothers of C and D respectively.

Thus, S has one son and two daughters.

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

---

95. Answer: a

Explanation:

Given

Average age of a family of 8 members is 39 years

Family adopts new born baby after 6 years

Formula used

Average = Sum of all observation/ Number of observation

Calculation

Sum of the ages of 8 members in a family = 39 × 8

⇒ 312

Age of new born baby would be 4 years, as it was adopted after 6 years of present age.

Sum of Age after 10 years from present age = 312+ (8 × 10) + 4

⇒ 312 + 84

⇒ 396

Now, there will be 9 members in a family.

Average age of 9 members of a family after 10 years from now = 396/9

⇒ 44 years.

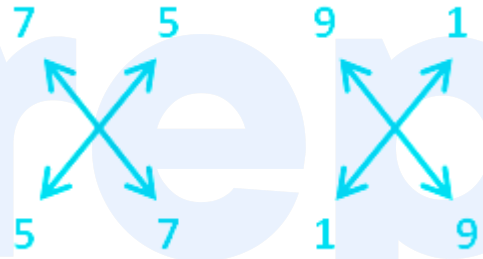
∴ T he average age of the family 10 years from now is 44 years.

---

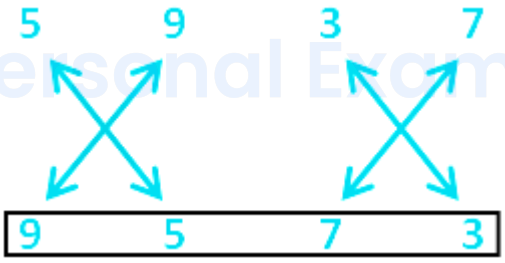
96. Answer: c

Explanation:

The second number-cluster is related to the first number cluster as follows:-



Similarly,



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

---

97. Answer: c

Explanation:

Given

Total number of questions = 100

Marks awarded for right answer = 1

Marks deducted for wrong answer = 0.33

	Ability 1	Ability 2	Ability 3	Ability 4	Ability 5
Easy(30 questions)	6	6	6	6	6
Medium(50 questions)	10	10	10	10	10
Difficult(20 questions)	4	4	4	4	4

Calculation

Sachin answered right in First three abilities and all question from easy category. it means his right answered was $(6 \times 5) + (10 \times 3) + (4 \times 3)$

$\Rightarrow 30 + 30 + 12$

$\Rightarrow 72$

Sachin gave wrong answer to the question of 4 and 5 level from medium and difficult category = $(10 \times 2) + (4 \times 2)$

$\Rightarrow 20 + 8$

$\Rightarrow 28$

Marks scored by Sachin = $72 \times 1 - (28 \times 0.33)$

$\Rightarrow 72 - 9.24$

$\Rightarrow 62.76$

$\therefore$ Sachin expected score is 62.76.

---

98. Answer: d

Explanation:

The logic followed here is:-

- First digit + third digit = second digit

1. 187 → 1 + 7 = 8
2. 165 → 1 + 5 = 6
3. 143 → 1 + 3 = 4
4. **159 → 1 + 9 = 10 ≠ 5**

Hence, the correct answer is **159**.

⭐ Alternate Method

The logic followed here is: Divisibility by 11

- 1. 187 ÷ 11 = 17

  2. 165 ÷ 11 = 15

  3. 143 ÷ 11 = 13

  4. 159 ÷ 11 = Not a whole number

Hence, **'159'** is the correct answer.

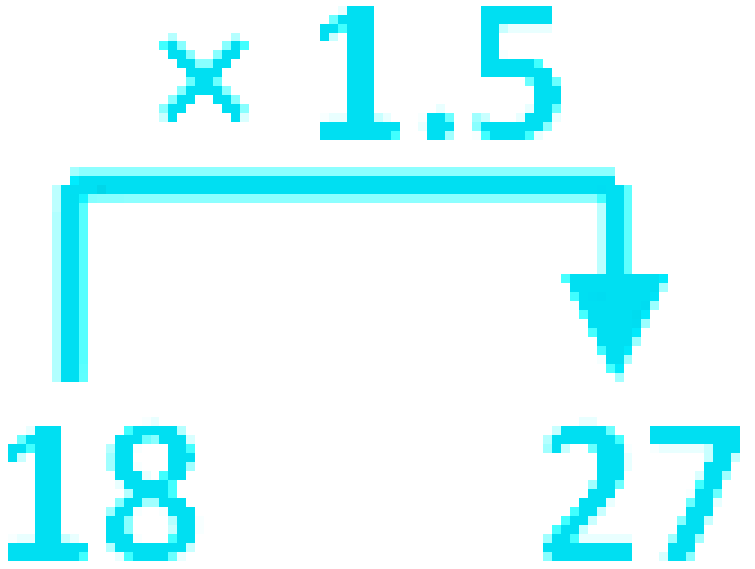
---

99. Answer: a

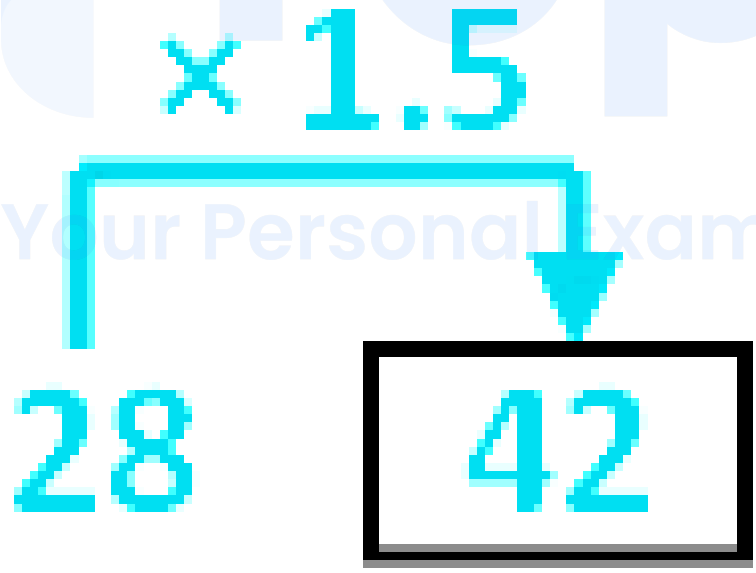
Explanation:

Second number is related to the first number as follows:-

-



Similarly,

- 

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

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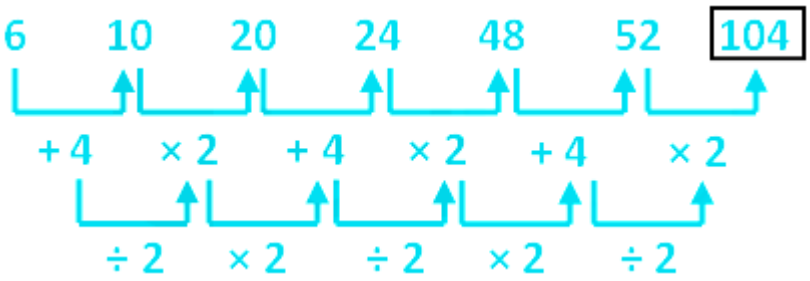
100. Answer: b

Explanation:

The logic followed here is:-



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